



Palm Island and Townsville Regional Resilience Strategy

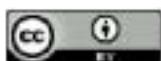




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The Palm Island and Townsville Resilience Strategy is a partnership between the Queensland Government and the Palm Island Aboriginal Shire Council and the Townsville Regional Council

Council

Website/Disaster Dashboard

Palm Island Aboriginal Shire Council

www.palmcouncil.qld.gov.au

Townsville Regional Council

www.townsville.qld.gov.au/disaster.townsville.qld.gov.au

Cover image: Townsville and Palm Island. Credit: Maxime Coquard, Tourism Events Queensland.

Image: Aerial view of Palm Island community. Credit: Shutterstock.

Foreword

The term 'resilience' in our region of North Queensland is meaningful to us. We pride ourselves on how we have overcome significant natural hazard events time and time again. Resilience is part of life for the people of North Queensland.

We recognise the importance of proactive efforts to mitigate disaster-related impacts to ensure our region continues to grow and prosper in a resilient manner. The need to strengthen our resilience is shared across our community, economy, environment and landscapes, and built form.

The purpose of this Palm Island and Townsville Regional Resilience Strategy is to guide how we work together to proactively support resilience actions and outcomes, now and into the future.

Resilience is a shared responsibility and this Strategy provides an opportunity to better understand our disaster risks, and proactively plan to strengthen the resilience of our community.



Image: Townsville harbor view on the Yacht Club Marina, The Strand and Castle Hill. Credit: Shutterstock.



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: First Nations woman teaching traditional weaving to tourists, Palm Island. Credit: Shutterstock.

Palm Island and Townsville region



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Our resilience visions

Palm Island

We are a people surrounded by unparalleled natural beauty, and have a deep physical, cultural and spiritual connection to the land and the sea.

The rich history and culture maintained by our Elders and community defines our unique character and values.

We seek solutions fit for our unique circumstances, consistency in support, and reliability in equitable infrastructure to enable a prosperous future. We know that through working together and harnessing opportunity on all scales we can achieve greater resilience socially, culturally, and economically

Our community is a place where our youth can embrace local opportunities and where our Elders can stay. On Palm Island, people can learn and grow.

We are a small community, but together we are strong and resilient.

Townsville

We are the growing capital of North Queensland. We provide the strength, resources and expertise to ensure the region continues on a path to prosperity.

We leverage our recovery experiences as a catalyst to teach others about what it takes to be resilient. We proactively take steps to embed resilience in all that we do, contributing to a safe and sustainable community.

Our community is more resilient when we find new ways to succeed and adapt to a changing climate, through enabling opportunity and fostering innovation. We are committed to initiatives that inform our community, understand risk and unify actions towards a common goal for a climate-ready Townsville.

Our resilience vision extends from our Wet Tropics World Heritage Areas to the dryland grazing country and the deep waters of Cleveland Bay. We will build opportunities to embrace natural processes, to absorb pressures and impacts and protect our natural and built landscapes.

Our people, communities and culture, collectively and individually contribute to a resilient North Queensland. We provide steadfast support to whoever requires it.

Image: The Strand Rock Pool, Townsville. Credit: Shutterstock.

About the strategy

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

This Strategy encourages a role for everyone in the Palm Island and Townsville region to rally around and deliver upon a common description of regional resilience. It highlights key opportunities to build disaster resilience that is unique to our region.

The end goal for resilience is to shorten and minimise recovery to future disaster events, and to enable transformation and adaptation to the range of stresses and shocks we experience on Palm Island and in Townsville.

Objectives

The objectives of this Strategy are to:

- **identify and support the region's disaster resilience priorities**
- **describe our priorities in the voice of our region**
- **identify unifying and strengthening actions and initiatives to address and support resilience needs**
- **prioritise the identified actions and initiatives**
- **connect priorities to future funding and resourcing opportunities**
- **document 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:

- **tell the unique story of resilience relative to Palm Island and Townsville**
- **focus on what needs to be done to improve disaster resilience across the Palm Island and Townsville region**
- **deliver a clear Regional Resilience Strategy and Local Action Plans to improve disaster resilience for our region.**

Council partners

The Palm Island and Townsville Regional Resilience Strategy is a partnership between the Queensland Government and:

- **Palm Island Aboriginal Shire Council**
- **Townsville City Council.**



Values guiding our resilience pathway

The Strategy reflects our values on Palm Island and in the Townsville region, which are unique and make us who we are. There are six underpinning values that guide our resilience pathway.

Palm Island	Townsville
Identity	
Our cultural identity is reflected in our daily lives, places we walk, visit, celebrate, work, or connect with actively or instinctively. We can enhance resilience by drawing on our people’s deep connection to Country, language and traditions.	We are the northern capital, strong and prosperous. We are protective of our generous and relaxed lifestyle.
Local leadership	
We are locally empowered to lead our community and plan ahead for ongoing prosperity in the face of natural processes and weather events.	Our leaders pursue our vision of a resilient regional economic powerhouse.
Care for Country	
Our knowledge of, and respect for Country forms part of all we do and is passed between generations.	
Innovation and ingenuity	
We focus on the development of our skills, capacity and will continue to build an independent and bright future.	We value our solid regional skills and capacity which will continue to build an independent and bright future. Our pragmatic solutions to complex challenges drive leadership, and innovative results.
Adaptability	
Because we know our circumstances can change with each disaster season, we are stoic in the face of events but also foster flexible and adaptable approaches to all that we do.	Because we know our circumstances can change with each disaster season, we are stoic in the face of events but also foster flexible and adaptable approaches to all that we do.
Personal responsibility	
We acknowledge that we all have a role to play in being resilient, being ready and preparing for what the weather and climate will throw at us. We also chip in to support our neighbours and community, when help is needed.	

Image: Townsville City Council big map exercise. Courtesy QRA.



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 hazard events.

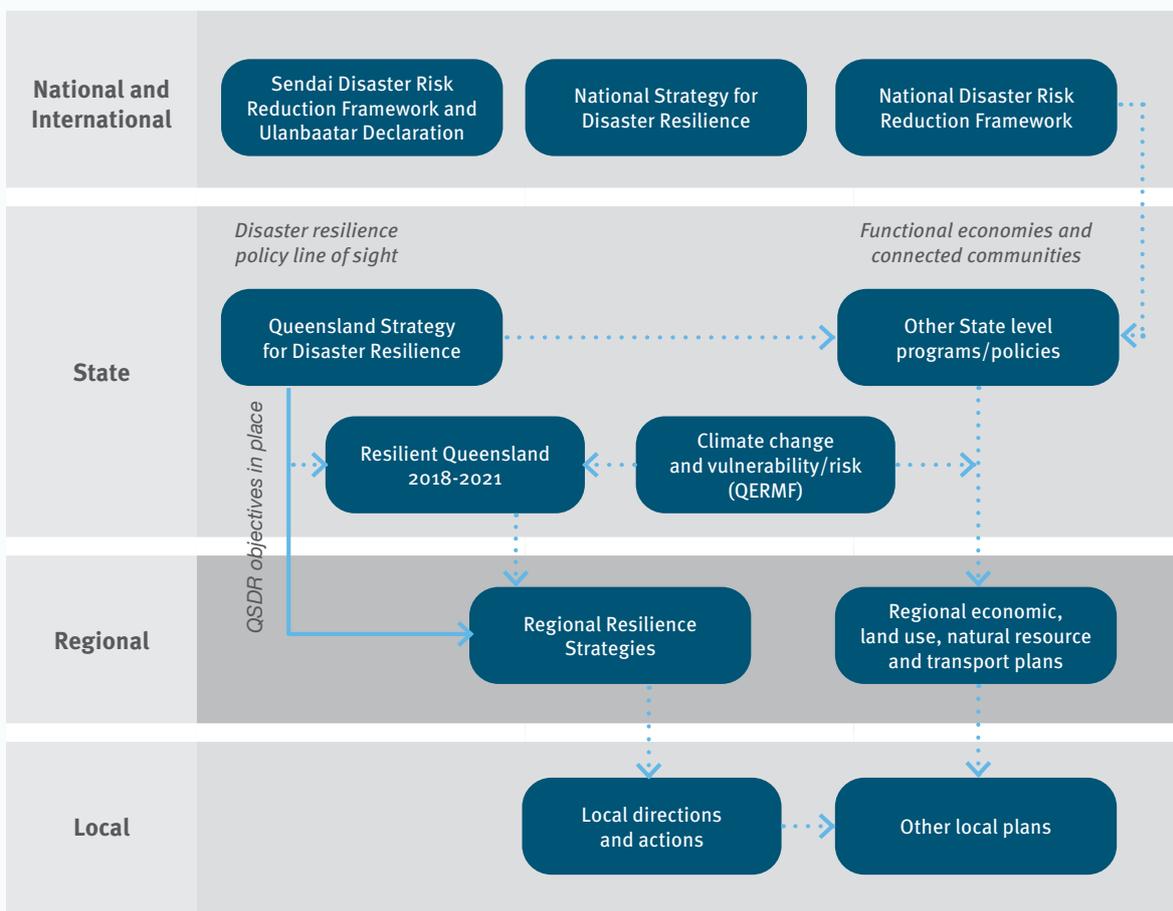
From 2022, every region across Queensland will be part of a locally led and regionally coordinated blueprint to strengthen disaster resilience.

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 Palm Island and Townsville Regional Resilience Strategy aligns the Queensland Strategy for Disaster Resilience (QSDR), 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) and the Queensland Climate Adaptation Strategy (QCAS).

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





Our locally-led approach

This strategy has been developed using a community-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 which is a resilience building approach that is 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 Palm Island and Townsville 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.



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

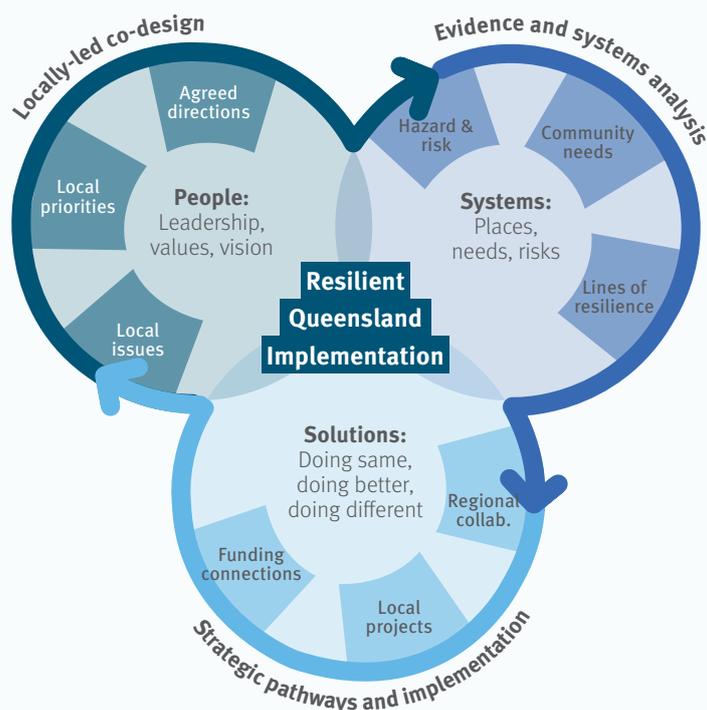


Image: Wharf on the strand in Townsville with Magnetic Island in the background. Credit: Shutterstock.

How this Strategy has been developed

This Strategy have been developed with the input of 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: human and social; economy; roads and transport; towns and infrastructure; and environment.

The Strategy was developed taking a disaster lens to our economic social and environmental system to ensure the best of disaster management and risk reduction practices can be brought into effect in the Palm Island and Townsville region.

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

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

- flooding
- bushfire
- heatwave
- earthquake
- severe wind, storm and cyclone.

Drought and other natural hazards such as storm tide inundation are also considered by the Strategy where they have 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 developed for the Queensland Climate Adaptation Strategy (QCAS) and the QCoast 2100 Coastal Hazard Adaptation Program.

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 linkage between locally identified actions or projects, 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.

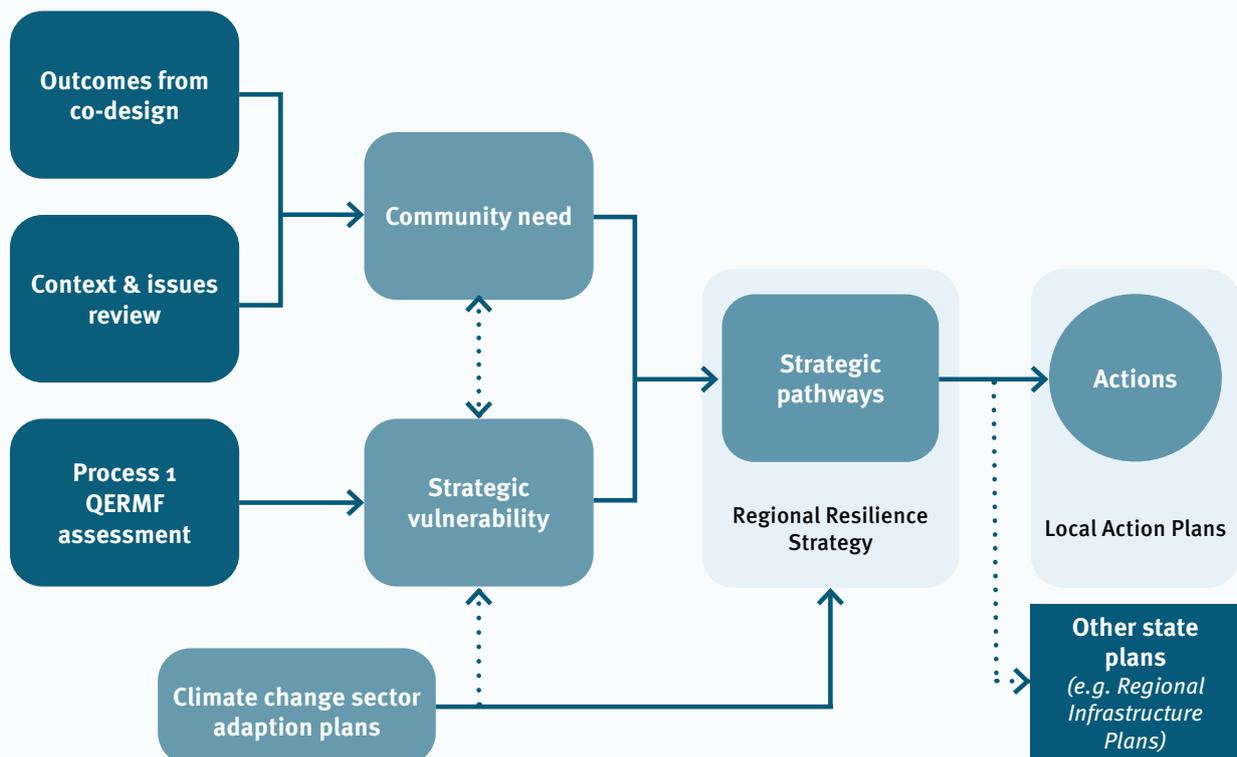
This Strategy is supported by Local Action Plans setting out the specific projects and initiatives that are needed to deliver on the aspirations set out by the Strategy. These Local Action Plans are provided to partner councils to implement.

In Townsville, tremendous innovation has been catalysed following the devastating impacts of the 2019 North and Far North Queensland Monsoon Trough event. Combined with key regional investment opportunities such as those driven by the Townsville City Deal, fostering the ability for multi-sectoral resilience to disaster impacts to continue to grow.

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 State Natural Hazard Risk Assessment and hazard-specific risk assessments prepared by Queensland Fire and Emergency Services](#)
- [Climate Change Sector Adaptation Plans](#)
- [Queensland Climate Resilient Councils Climate Risk Management Framework and Guideline](#)
- [QCoast2100 Coastal Hazards Adaptation Program](#)
- [Townsville CHAS 2012](#)
- [Various NQROC programs including the NQ Waste and Resource Recovery Strategy 2020-2030](#)
- [NQ Regional Plan 2020 \(DSDILGP\)](#)
- [Local government corporate plans, economic development, biosecurity, and other plans](#)
- [Local government natural hazard strategies and Local Disaster Management Plans](#)
- [Towards a Flood Resilient Townsville - Townsville Floodplain Management Strategy](#)
- [Palm Island Masterplan \(DSDATSIP\)](#)
- [Dry Tropics NRM studies, strategies and plans](#)

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





Resilience in the Palm Island and Townsville region

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.

The word 'resilience' is particularly profound to us in North Queensland, it reflects the way we live our day-to-day life. From cyclones to floods, and periods of punishing heat and humidity, we bear the brunt of some of Mother Nature's most extreme activity. Our band of islands in the Coral Sea and coastal mainland increases our exposure to a spectrum of natural processes and hazards.

There is much that our region has endured and overcome over its history, and as a people, we do not shy away from the risks that we face, particularly during the summer monsoon and cyclone season. Instead, we take measures to prepare and support others in our community to do the same. Whilst we acknowledge that we have a highly mobile population, living life between the islands and the mainland as well as the transience of our significant local Defence presence, we all know we need to be prepared for the expected and the unexpected.

We are practiced in self-sufficiency, in the face of our exposure to flood, wind, heat, storms and fire. Our resilience is born of a lived experience that has taught us to know what to expect, to learn from it, and to work together as a community toward a stronger tomorrow. Between Palm Island and Townsville, we tend to experience the same weather and natural hazards, but we are very different places and communities..

In Palm Island and Townsville, our circumstances can change with each disaster season. Nestled in the Dry Tropics, our climate, vegetation and areas of steep terrain can give rise to serious bushfire events. Following rain, the potential for landslide and significant erosion increases. We are also exposed to periods of heatwave and are not immune to potential for earthquakes.

Being proactive and working together to plan for a broad range of potential extreme weather and disaster scenarios will help to improve resilience for our region.



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.

There are many geographic, demographic and climatic trends or events that can have major impacts on the region.

Trends

Transformative forces that could change a region including:

Palm Island	Townsville
<ul style="list-style-type: none"> • growing economic opportunity • education and skills development • focus on caring for Country • health and wellbeing • climate change • digitisation • physical and digital connectivity with the mainland. 	<ul style="list-style-type: none"> • increasing population migration, transience and multiculturalism • loss of young population • opportunities to work remotely from regional centres • increased digital enterprise • climate change • globalisation and increased opportunity to access markets • opportunity as one of Australia’s most northern urban centres.

Stresses

Long term situations or circumstances, weakening the potential of a given system and deepening vulnerability:

Palm Island	Townsville
<ul style="list-style-type: none"> • limited food and water security • higher than average unemployment • rising sea levels • housing availability • construction costs • skilled workforce availability • access to infrastructure and services • pandemic • feral animal and weed control • compliant waste management. 	<ul style="list-style-type: none"> • reducing availability and rising cost of insurance • the changing economic markets which bring both opportunity and risk • rising sea levels • age of core housing and building stock • urban heat island effect • groundwater impacts • pandemic • reduced levels of volunteerism • protection of World Heritage Areas and the Great Barrier Reef.

Image: The Palmetum, Townsville. Credit: Shutterstock.



Shocks

Sudden events with an important and often negative impact on the vulnerability of a system and its parts:

- bushfire and grassfire
- cyclones and storms, severe wind and storm tide
- flooding
- heatwave
- earthquake
- landslide
- accidents and industrial incidents.

Core resilience needs

Core resilience needs include:

Palm Island	Townsville
<ul style="list-style-type: none"> • support for disaster management resources, capability and capacity • essential service delivery • improved facilitating infrastructure or innovation in digital connectivity, water and energy • infrastructure resilience • keep culture alive and strong by limiting needs to relocate for health, education and employment • social wellbeing and population stability projects • celebration of local culture and language into community as a system and highlighting connection to Country • strategic prioritisation of improvements to supply chain routes to reduce disruption • continued improvements to alternate transport and access options including airstrips and sea freight. 	<ul style="list-style-type: none"> • consistent commitment to essential service delivery • continual improvement physical and digital connectivity to support economic growth • enhanced infrastructure resilience through betterment and prioritisation • economic innovation to support diversity and sustainable economic growth • community amenities to support social and community resilience • climate adaptation and mitigation actions to address risk • support for disaster management resources, capability and capacity • support for natural systems and landscape sustainability actions • support for urban heat design interventions • improved insurance outcomes through greater community understanding • community awareness, particularly of the complex flood and coastal environment • enhanced self-sufficiency at the community level.



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 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.

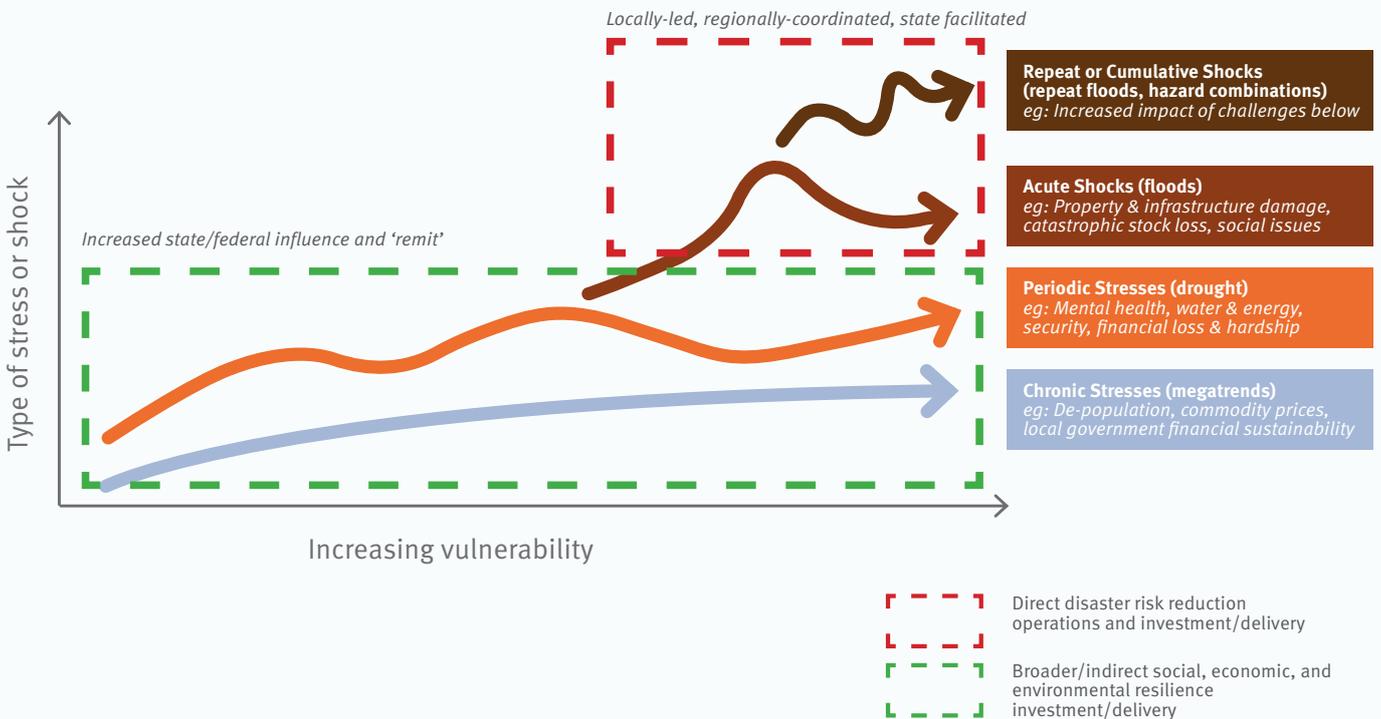


Image: Torrential rain during Cyclone Ita on The Strand, Townsville.
Credit: Shutterstock.



Rethinking resilience in the Palm Island and Townsville region

To date much focus has been on post-disaster recovery processes and building resilience through programs like infrastructure improvements that can limit the impacts of recurrent events.

However, with our lived experience of recovery, we now 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.

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 communities to thrive in spite of the stresses and shocks they face. We must 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 Palm Island and Townsville region to grapple with long term trends and stresses like climate change, drought, and economic downturn.

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).

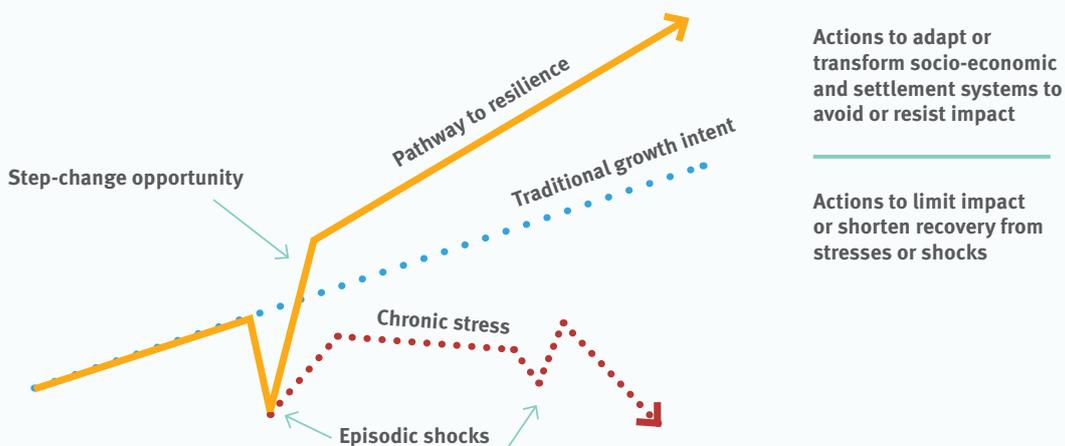


Image: Aerial view of Palm Island community. Credit: Shutterstock.



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.

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

The reforms to 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 and 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.

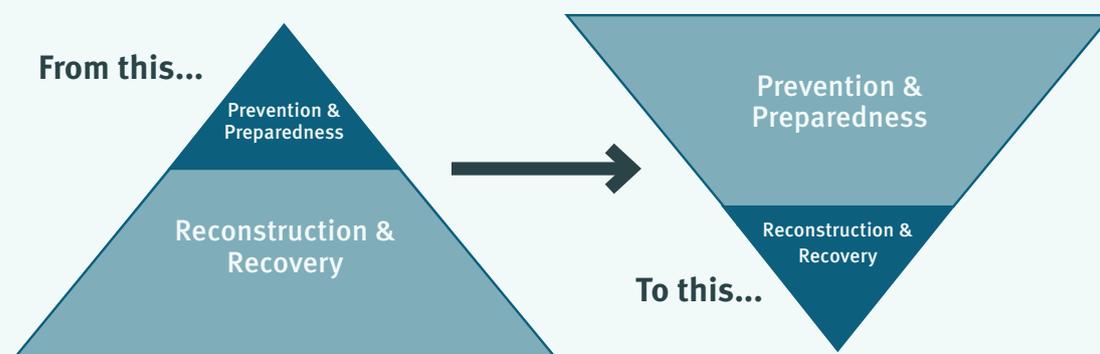


Image: Beach sign to warn swimmers of marine stingers in the water.
Credit: Shutterstock.

Our region

This diverse region includes Townsville – the ‘second Queensland capital’, the much-visited Magnetic Island, part of the Wet Tropics World Heritage Area, the Greater Palm Island group, and the extensive grazing country of the Hervey Range. This region has an area of 3,796.8 square kilometres in the dry to wet tropics area of North Queensland.

Combined population of the region is 197,000 people and like many coastal regions of Queensland, it was founded in the mid 1800s as a port for the fledgling pastoral industry of the hinterland and further west. The focus soon turned to gold, and Townsville developed into the principal centre and effective ‘capital’ of North Queensland.

The Townsville region is bounded by the peaks of the Hervey and Paluma Ranges forming the western boundary; the low lying agriculturally productive lands of the Burdekin to the south; pastoral and mineral enterprise of the west, and the beginning of the World Heritage listed Wet Tropics and international tourism gateway to the north.



Image: Ross River, Townsville, in Douglas/Cannon Park area. Credit: Shutterstock.



Palm Island

Palm Island Aboriginal Shire is made up of ten picturesque islands located within the Great Barrier Reef Marine Park about 65 kilometres north-east of Townsville. The islands cover a combined area of 7,100 hectares and are mostly of a natural state apart from the largest island known as Palm Island, Great Palm Island, or its Indigenous name, Bwgcolman (pronounced Bwook-a-mun).

Palm Island is now home to one of the largest Aboriginal communities in Queensland with a population of over 2,600 which can grow to between 4,000 and 5,000 as families come together throughout the year. In this regard, it can sometimes be difficult to know exactly how many people are on the island at any one time. The median age of residents is young, at 26 years, compared with the rest of Queensland at almost 37 years.

The Bwgcolman town centre is located on the western side of the island along with the majority of the settled areas.

Palm Island was originally inhabited by the Manbarra people who are recognised as the Traditional Owners. Today, Palm Island is home to a diverse group of First Nations Australians, descendants from over 40 different tribes who were forcibly removed throughout Queensland and relocated to Palm Island since 1914. Collectively, the people of Palm Island are referred to as Bwgcolman people which means ‘many tribes, one people’. Some First Nations families reside in smaller informal settlements across the islands.

On 26 October 1986 ownership of Palm Island was transferred to a newly formed Palm Island Community Council under a Deed of Grant in Trust from the Queensland Government. The Palm Island Community Council became the Palm Island Aboriginal Shire Council in 2004. This gave the Council, and several others like it, full status as a local government on a par with other councils in Queensland.

Economic activity on Palm Island is dominated by public administration, safety and community services, followed by health care and social assistance, education and training, construction and arts, retail and accommodation and food services. The land tenure of the island and property rights, along with high unemployment, affects real economic opportunity which has been a key focus for the Council.

Development on Palm Island is determined by an Indigenous Land Use Agreement, which defines the township area and enables the Manbarra people to be involved in decision-making outside the township area.

Palm Island is accessible by air, ferry or barge. The Palm Island Airport is located in the south of the island between Butler Bay and Casement Bay and receives regular flights from Townsville. Regular ferries from Townsville and a barge service out of Lucinda also service Palm Island. The other islands are only accessible by private boat.



Median age – 26.2 years

(compared to 37.4 years across Queensland)

31.6% under 14 years old

(compared to 19.4% across Queensland)

4.3% over 65 years old

(compared to 15.7% across Queensland)

93.9% Aboriginal and/or Torres Strait Islander peoples

12.6% migration rate over last five years

(compared to 44.1% across Queensland)

16.9% multiple family households

(compared to 1.8% across Queensland)

100% of population within the most disadvantaged SEIFA quintile

54.9% unemployment rate

Top three employing industries:



Health care and social assistance (27.7%)



Public administration and safety (25.3%)



Education and training (23.0%)



Townsville

The Traditional Owners of the Townsville region include the Wulgurukaba of Gurambilbarra and Yunbenun, Bindal, Gugu Badhun and Nywaigi Peoples.

Townsville is the largest urban centre outside of Brisbane with a population nearing 200,000. The greater Townsville area has a diversified economy serving the wider Northern Queensland in agriculture, manufacturing, health care and social assistance, retail, tertiary education and has a significant defence economy.

Townsville City acts as a regional service and supply centre and access point for north and far north Queensland industry and businesses providing air and seaport services, infrastructure, skills and lifestyle facilities to support the growing economy. It contributes \$17.1 billion to the Queensland economy in a diverse economic base with extensive logistical network strategically positioned to provide goods and services across the region, state, country and abroad. The North Queensland Regional Plan identifies the region as the 'gateway to the Asia-Pacific'

The Port of Townsville is a high value facility which handles 10 million tonnes of cargo or \$10 billion to Queensland each year. It acts as a strategic supply hub for imports and exports handling 30 different commodity types including dry bulk agriculture, mining products, liquids, and containerised cargo,

Outside of greater Townsville, the primary economic industry is dryland and irrigated agriculture, with sugarcane being the main focus as well as grazing.

The region is strategically connected via the Bruce Highway to the north and south, and the Flinders Highway and Hervey Range Road connecting to Charters Towers to the west. Two major rail networks connect to the Port. The North Coast Line connects north and south of the state, while the Mount Isa Line connects Townsville to the west.

Tourism is also a fast growing industry for the region underpinned by our diversity of high quality sport facilities and events, proximity to the Great Barrier Reef, local tourist attractions and other major tourist sites such as Magnetic Island known affectionately by the locals as Maggie Island.

The region is home to the much-supported North Queensland Cowboys located at the new 25,000 seat Queensland Country Bank Stadium which is an initiative of the City Deal. This deal between all levels of government enables significant infrastructure projects like the stadium to proceed to underpin regional economic growth for the benefit of all. The City Deal focuses efforts on industrial expansion, defence, developing a port city and smart initiative for an innovation led future.



Median age – 34.6
(compared to 37.4 years across Queensland)

19.9% under 14 years old
(compared to 19.4% across Queensland)

12.8% over 65 years old
(compared to 15.7% across Queensland)

7.0% aboriginal and/or Torres Strait Islander peoples

46.2% migration rate over last five years
(compared to 44.1% across Queensland)

81.0% of private dwellings are separate houses

21.2% of the population is within the most disadvantaged SEIFA quintile

7.1% unemployment rate

Top three employing industries:



Health care and social assistance (14.6%)



Public administration and safety (13.7%)



Retail trade (9.9%)



Our landscape

Palm Island

Palm Island is a near pristine dry tropics landscape, particularly those islands which are generally uninhabited. Palm Island itself is an idyllic and picturesque location. Located amongst the Great Barrier Reef Marine Park it is surrounded by coral reefs supporting a rich array of sea life including crayfish and coral trout.

The island consists of many beautiful bays and beaches nestled amongst the steeply rising terrain. Mount Bentley, sitting at 548 metres above sea level is the highest point on the island, to the south-east of the Bwgc Colman town centre.

Palm Island as the largest of the group with Fantome Island and Curacao Island twin islands off the northwest coast. Esk, Falcon, Eclipse and Brisk Islands are all quite small in a group off the southwest shore of Palm Island. Havannah and Fly islands sit together a little further southwest approximately eight kilometres from Miranda Point. The tiny Barber Island sits just off the southern shore.

Less than 10 per cent of the islands is considered a modified environment, with over 80 per cent of the islands characterised by estuarine and palustrine wetlands, and riverine systems. Most of the estuarine areas are dominated by mangroves. A number of wetlands of High Ecological Significance are identified on Palm Island, three of which are located in the vicinity of developed areas (one between Butler Bay and Casement Bay and another two near Wallaby Point Road and Minggudjamba Banbarri Barra Dam).

Areas 'of concern' and small areas of 'endangered' regional ecosystems are located across the islands.

Palm Island is largely characterised by mountainous terrain covered in rainforest and eucalyptus open woodland however, the volcanic soils support a diverse range of delicious fruits including mango, pawpaw, banana and wild plums.

The Aboriginal and Torres Strait Islander Cultural Heritage Database identifies numerous places, middens, burials, artefacts and structures on Palm Island that are culturally linked with the identity of the Traditional Owners and are protected by the State.

A 2009 cultural heritage study identifies that the Palm Island Aboriginal Culture Heritage Area contains cultural and natural resources that are significant to the Manbarra People as a definite and tangible link to traditional and more recent aspects of their heritage. The area contains artefacts scatters, shell middens, scarred trees and a dugout canoe.

Connection to Country is a core value of local Traditional Owners and First Nations populations. This connection takes in land and sea, and extends to the Great Barrier Reef Marine Park which surrounds Palm Island.

The main island has numerous short run creeks draining to the ocean in all directions due to the highest point being generally central to the island. There are three dams located above the township.



Townsville

Townsville is bound by the coast to the east, Hinchinbrook to the north, Charter Towers to the west and Burdekin to the south.

The region takes in three different bioregions including the Wet Tropics, Einasleigh Uplands and Brigalow Belt which covers over 60 per cent of the region.

There are a number of spectacular national parks in the region such as Bowling Green National Park and Magnetic Island National Park.

Bowling Green Bay is located about 13 kilometres south-east of Townsville and covers 57,900 hectares of coastal and mountainous country. This equates to approximately 10.5 per cent of the Townsville LGA. The wetlands in the national park, which form a portion of the area, are internationally recognised, particularly for the mass congregations of waterfowl such as magpie geese and broilgas. These wetlands are recognised as being of regional and international significance by the Great Barrier Reef Region Strategic Assessment as it is one of the remaining, relatively intact wetlands situated adjacent to the reef, and supports the ecosystem of the reef through nutrient assimilation and sediment stabilisation (Australian Government Great Barrier Reef Marine Park Authority, 2014).

Magnetic Island National Park is situated off the coast from Townsville. It was formed over 275 million years ago when volcanic forces pushed molten granite up to the earth's surface. The overlying volcanic rocks were weathered away over time, resulting in a landscape of rounded domes and boulders. The national park features rocky granite headlands scattered with tall hoop pines that overlook the sandy bays on this mountainous island which is surrounded by coral reefs and covered with open eucalypt woodlands. A number of iconic Australian animals inhabit the island including koalas, rock wallabies and echidnas and over 180 bird species. Large marine animals such as sea turtles and dugongs feed in the extensive seagrass meadows surrounding the island. There are also 23 different vegetation types ranging from mangrove forests to Littoral rainforests.

Other notable protected areas in the region include Paluma Range National Park, Clemant State Forest, Mingela State Forest, Townsville Common Conservation Park, and the Pinnacles National Park.

The northern area of the LGA takes in the southern extent of the wet tropics and including the Paluma Range National Park, and is widely revered for its unique birdlife. Lake Paluma, nestled above the national park, provides part of Townsville's drinking water supply and is a referrable dam.

The landscape features of the Townsville LGA is generally bound by higher topography to the west and south which falls towards the coastline. These valued landscape features, whilst majestic in their own right, are directly linked to the region's exposure to multiple natural hazards.

There are three primary catchments in the region:

- the Ross includes the southern watercourses off the Hervey Range and The Sisters Mountains
- the Bohle includes a large area of urban area of Townsville
- the Black includes the northern watercourses off the Paluma Range.

The watersheds almost form the entire boundary of the region with the exception of a small area of the Burdekin catchment in the south west corner of the Townsville region.

The Black basin includes numerous short run watercourses which have headwaters in the Paulma Range with many having total flow distances of less than 10 kilometres.

The Ross basin has a sub basin of the Bohle River. The basin has its watershed to the west in the balance of the Hervey Range. The basin also collects water from The Sisters Mountain south of the Ross River dam. These peaks form the watershed between the Ross and the Haughton Rivers.



Case study: Protecting the Great Barrier Reef – Everyone’s Game

Protecting the natural environment is a key element of environmental resilience.

The only living structure visible from space, the Great Barrier Reef is the largest and most diverse marine ecosystem on the planet. Being one of two World Heritage Areas in the region (the second being the Wet Tropics of North Queensland World Heritage Area), the reef is an iconic feature that underpins much of the Queensland economy and is especially vital to North Queensland.

The resilience of the Great Barrier Reef faces a number of pressures. The inshore condition of the central section of the reef is known to be in decline. During the past 30 years, coral cover has declined by nearly 50 per cent on mid-shelf and offshore reefs, underscoring the declining health of the reef. The central section of the reef has also seen the most severe bleaching from the mass-bleaching events of 2016 and 2017. Largescale bleaching is a stress response to higher than average water temperatures and, with climate change, this is expected to become a more frequent occurrence.

While the drivers for climate change are global, localised stressors, such as poor water quality, also influence reef health. Increased urbanisation (contributing wastewater, stormwater and associated contaminants) and land-based run-off from agricultural practices are also adding significant pressure. Recent science on sediment effects identifies that increased nutrient loads also contribute to more frequent outbreaks of crown-of thorns starfish, resulting in further coral cover decline.

There has been some improvement in land management and farming practices in the past decade, however significant work is still required to address sediment, inorganic nitrogen and pesticide runoff in the region.

Other pressures include direct use and loss of wetlands, coastal habitat changes and loss of habitat connectivity and population growth.

The region does not currently enjoy the volume of direct reef tourism of Far North Queensland or the Mackay, Isaac and Whitsunday regions. However, it functions as the administrative, management and research epicentre for the Great Barrier Reef. It is the base for the Great Barrier Reef Marine Park Authority, Australian Institute of Marine Sciences, Australian Research Council’s Centre of Excellence for Coral Reef studies, TropWATER, CSIRO and ReefHQ aquarium. The region’s status is internationally recognised with James Cook University ranked number one in the world for marine biology and number two for biodiversity conservation research.

Building on this position – and reinforcing the North Queensland region as a global leader in environmental research, management and governance – is a key future outcome for the region identified by the North Queensland Regional Plan and will benefit the ongoing protection and management of the Great Barrier Reef.

Townsville and Palm Island Queensland





Our climate

Our region is characterised by a tropical, humid climate with warm to relatively high temperatures throughout the year and has designated wet and dry seasons. Rainfall in our region is generally short in duration with high intensity tropical storms that primarily occur between the months of November and April, with rain being the most concentrated during the monsoonal season from late December to early April.

There have been a number of exceptions to this of course, where longer, high intensity rainfall systems have impacted the region on occasion. For example during the 2019 North and Far North Queensland Monsoon Trough event in and around Townsville, the accumulated daily rainfall totals were the highest since records began in 1888. Numerous areas reported 12-day accumulations of more than 2,000 millimetres, including at Paluma, Woolshed, and Upper Bluewater (BoM).

Rainfall systems

The average annual rainfall of the region is 1,146 millimetres around Townsville. 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 variable. Rainfall is relatively reliable in the region during the monsoonal season.

Situated in the Brigalow Belt bio-region and known as the Dry Tropics, the region is known to be much drier than the surrounding more tropical climates from the Paluma Ranges north and from the Whitsundays south.

Our region operates in dry and wet seasons. Heavy rainfall in the region is most often caused by tropical lows which can form into cyclones. Both of these can lead to widespread flooding, coastal hazards and wind damage.

A monsoon usually develops over northern Australia during the summer season when the land warms at a faster rate than the ocean, resulting in a considerable sea breeze circulation that draws in moisture from the ocean over the lower pressure of the land. A monsoon trough becomes established as humidity rises. True monsoonal flow, with deep low-level westerly winds, exists north of the trough, so when the trough moves south over a location, this area becomes affected by monsoonal conditions.

Severe storms and cyclones

Tropical cyclones are a familiar force in our region in North Queensland. These events predominantly affect the coastline of the region however, they can and have caused impact further inland.

The James Cook University Cyclone Testing Station is a leading research hub working alongside government and industry, supporting Townsville and other cyclone-prone areas of Australia to find new ways to continuously improve our resilience to tropical cyclones.

Temperature

Temperatures in our region have an average annual minimum of 19.7°C to an average annual maximum of 28.7°C around Townsville based on climate averages from 1871-2015. The region is no stranger to the effects of tropical cyclones and associated strong winds, storm surges and flooding.

Summer on Palm Island and in Townsville is hot, with the region experiencing more hot days in the past 30 years compared to the years prior (BoM, 2021). 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.

Image: 2019 Townsville Floods. Credit: Shutterstock.



Fire weather

Bush and grass fire is endemic to different landscapes of the region, often ignited by lightning strike, accidental causes or deliberate activities.

Good fire also supports a healthy landscape, with many of the region's ecosystems dependent on a level of fire frequency. It can also be vulnerable to fire that is too frequent which can change the biodiversity and ecological values of regional ecosystems. The frequency of fire is known as the fire regime, and different vegetation communities require different fire regimes.

Aside from fuel loads, our weather and climate has 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 BoM, from 1950 to 2018, annual accumulated FFDI has increased in the area by 11 per cent. However, the average annual occurrence of fire weather days exceeding FFDI 50 has decreased by 26 per cent since 1950 (BoM, 2019).

Overall fire weather conditions are intensifying but may be becoming less frequent in the region. What this means is that higher fire danger days are occurring and likely associated with drought and heatwave phenomena.

Drought

Droughts have a long history in the Palm Island and Townsville region. Whilst a small area of Townsville is situated in the wet tropics, the majority of the region is within the dry tropics region.

The characteristics of drought are like no other natural hazard. The timeframes and severity are unknown; it's hard to know if you are in one until a considerable time passes. They are slow moving, gradual events with cumulative and compounding effects which are often psychological and financial rather than physical. Once the rain comes, recovery is equally long and arduous.

Notable drought events include:

- Federation Drought 1895-1902
- May 1914 – March 1915
- April 1982 – February 1983
- April 2002 – January 2003.

Future climate trends

Looking forward, our climate is projected to bring more frequent hot days particularly in the summer and higher annual temperatures. There is the possibility of this having an indirect affect on the intensity of fire weather.

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.

Rainfall is projected to become concentrated, with a higher incidence of high volume, intense events. More intense episodes could increase vulnerability in terms of flood inundation, increased potential for erosion and a reduced infiltration effect.

Sea level rise, warmer and more acidic seas is projected, bringing with it increased exposure to coastal hazards including those associated with cyclone events. Cascading impacts may occur for marine life and marine environments.

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



Our challenges and opportunities

Our region experiences significantly different challenges and opportunities which is a reflection of the size and composition of each local government area.

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.

Palm Island

Environment

Located within the Dry Tropics, Palm Island is a unique place in that it has a drier climate than Far North Queensland but still experiences intense storms and cyclones during the wet season. This results in a delicate balance between the dry season and wet season.

The beaches and foreshore areas of Palm Island are subject to coastal hazards, with the western side of the island considered a high risk storm surge area which is also where the Bwlgolman town centre is situated.

The North Queensland Regional Plan identifies that future development on the island should be consolidated and avoid high risk areas.

A unique challenge for the Palm Island community is managing nuisance animals on the island, including pigs, horses and dogs which damage our forests and spread weeds across the island as well as pose a safety risk to the community. The island also deals with a large fruit bat population which if not managed properly can cause a health risk to the community.

Removal of waste off the island including redundant infrastructure, car bodies and scrap metal is also of concern, particularly during storm season when these loose objects can become dangerous projectiles.

Re-establishing the once operational Indigenous Land and Sea Ranger program on the island is a significant opportunity which could assist with greater caring for country efforts through cultural burns, feral animal and pest plant control as well as biodiversity monitoring. Towns and infrastructure

Establishing enabling infrastructure on the island through reliable telecommunications and IT infrastructure as well as renewable energy generation would enable better economic independence and resilience through greater connectivity and access to global markets. Given the remoteness of the island however, this is seen as both a challenge and an opportunity.

With a growing population, ensuring suitable housing is available for the community is an ongoing challenge, particularly given the lack of appropriate land available on the island. These aspects remain a key aspect of focus of the North Queensland Regional Plan.

Access to electricity, water and sewer infrastructure and services is a basic expectation and is critical to creating a positive enabling environment for our community. Maintaining these infrastructure networks and ensuring their resilience to natural hazards places a strain on the budget, but can be limited through the adoption of a consolidated growth policy, including one that avoids higher risk areas and future outcomes which may inadvertently increase costs into the future.

Roads and transport

Our local road network is important to ensure we remain connected. It also plays a vital role before, during and post weather events to enable emergency services access and facilitate evacuation.

Maintaining the road network in a useable condition is a constant challenge. During storm season, our roads are frequently impacted, causing road closures for often long periods of time. Two coat sealed roads and dirt roads are particularly problematic, requiring almost annual maintenance and repair.

Travelling off the island can be a challenge particularly during a weather event which often causes flights and ferries to be cancelled. This is of particular concern when an emergency evacuation is required. It is also essential for medical emergencies, and access for the Royal Flying Doctors Service to treat patients and transport them to the mainland.

Expanding the active transport networks on the island is of great importance and would result in many benefits to the community.

Enhanced connectivity on, and to and from the island are key activities identified by the North Queensland Regional Plan.

Image: Palm Island. Credit: Shutterstock.

Palm Island (con't)

People and communities

Ensuring our community has the same access to services and opportunities available to the rest of Queensland will place Palm Island well to take advantage of prospects and capture possibilities to enhance the wellbeing of our community.

The provision of social services for all parts of our community will ensure our people have the support they need.

Palm Island has a young population with a very high proportion of youth and adolescents. Encouraging this population to be involved with the community, particularly through Elders, is a significant opportunity. This extends to opportunities to learn about caring for Country, in the many ways required to steward the environmental systems of Palm Island.

Of course, to fully enable our people it is important to provide a physical environment that our community is proud of. This involves continuing to create an attractive and safe township environment that has greater access to community facilities including schools, health care services and recreational facilities for people to enjoy.

Economy

An opportunity exists to increase the use of local labour and in turn reduce the reliance on outside help. This would result in greater economic independence and resilience for the island and could be achieved by generating greater diversity in local employment opportunities through improved education and training. This would ensure that money spent on the island could stay on the island by employing local trades and services, instead of engaging contractors from the mainland.

Obtaining the necessary funding to undertake projects on the island can prove difficult given the increased cost of construction and limited availability of resources.

In addition to the above and under the North Queensland Regional Plan the realisation of tourism opportunities on Palm Island offers great potential to strengthen the profile of the community and deliver employment, skills and small business growth. In terms of cultural heritage tourism, Palm Island has the potential for unique product offerings.

As identified by the Regional Plan, new tourism infrastructure will need to be designed to be resilient to and account for natural hazard events and variations in climatic conditions. This will ensure the tourism industry is able to quickly recover after an event, stimulating continued visitor demand and sustaining the local economy, independence and resilience.

Townsville

Environment

The terrain of the Townsville region generates fast-flowing and short-run catchments which are not only highly responsive to rainfall but are also interlinked. This means that flooding can be caused by riverine, creek, localised and overland flooding.

Vast areas of the region remain in their natural state, spanning dry eucalypt woodlands and forest through to areas of protected tropical rainforest.

A key focus for the region is the restoration of natural systems – from coastal environments, wetlands and mangroves through to floodplains and natural bushlands. The re-establishment of ecosystems and biological systems helps to reinforce all aspects of resilience, including social, economic, built environment and infrastructure resilience.

This focus on natural systems, as opposed to isolated environmental assets, ensures the landscape is in the best possible condition to withstand natural hazards to reduce the potential for damage and loss. This is underpinned by the desire to take proactive steps to enhance environmental resilience, rather than repair following events.

A key opportunity into the future includes a focus on public and private infrastructure that can absorb the impacts of natural processes, whether its cyclonic winds flooding, coastal hazards, bushfire, earthquake or heatwave. This is a critical philosophy underpinning the approach to environmental resilience in the Townsville region.

The need to redefine how the whole water cycle is managed, including waterways, wetlands, marine, groundwater, stormwater, potable, wastewater, and recycled water is a key area of focus. The benefits of such approaches will achieve a more liveable, resilient and productive community, providing enhanced amenity and economic development, and mitigation of urban heat issues.

These collective opportunities place sustainability at the core, building capacity for resilience. In this sense, resilience is simply the by-product of sustainable design.

Towns and infrastructure

As a coastal city and region built around a network of rivers, creeks and bushland corridors, Townsville's built form is robust, but is not immune to damage. Furthermore, it is being increasingly challenged by climate and weather extremes whilst needing to support the lives and livelihoods of residents.

Almost 3,300 properties were damaged during the 2019 North and Far North Queensland Monsoon Trough event. Damage to water and sewage infrastructure was also identified, as well as roads, rail and other public assets. Widespread disruptions to electricity and telecommunications also occurred.

Building provisions for cyclonic winds under the Building Code of Australia have been in place since the mid-1980s, there are further opportunities for us to consider how our built form can contribute to broader community resilience, especially insurance costs and uncertainty. Additional benefits in built form changes extend to outcomes for water sensitive urban design (WSUD).

Townsville City Council has partnered with the Cooperative Research Centre (CRC) for Water Sensitive Cities to leverage the experience of researchers, practitioners and communities from around Australia to develop an approach that is relevant to Townsville's unique identity and circumstances. After benchmarking the city's current state and transition progress, an overall vision and several high-level strategies were developed to promote Townsville's transition to a water sensitive city.

A focus on multi-purpose, multi-functional assets represents a key opportunity to drive forward Townsville's focus on sustainable, adaptable and functional urban environments.

Roads and transport

The transport networks which support Townsville's vibrant economic activity, as well as the movement of people and goods, are vital to the ongoing resilience of the region.

Our challenge is that almost all forms of transport and their networks are subject to natural hazards whether it is flood, bushfire, cyclone, heat, landslide, earthquake or coastal hazards. Impacts can be in the form of inundation (including damage), exposure to extreme heat, blockages and pavement destruction.

These challenges are amplified during events, particularly when evacuation is required and access for emergency services is needed. Access and egress considerations are especially relevant for those communities which rely on single access routes to and from town, including communities along the northern beaches. These issues endure across hazards, from coastal hazard impacts through to flooding and bushfire.

Our links to the north, south and west are also our opportunities as vital supply chain routes not only for Townsville but for surrounding regions, particularly our inland counterparts. Working together at the regional scale, across levels of government and alongside industry is crucial to bolstering the resilience of our key road and rail connections. An important aspect is ensuring works moving forward consider natural hazard resilience and the potential impacts of climate change are factored in.

Public transport services in Townsville provide an additional function that supports community resilience. Following events, and the displacement of community from bus networks to schools and work, innovative tactical responses have been deployed to enable the community to return to these key activities throughout recovery processes.

People and communities

The residents of Townsville are hardy, stoic and pragmatic, having endured one of Queensland's largest-scale disaster events in recent years with the 2019 North Queensland and Far North Queensland Monsoon Trough event. Everyone was impacted in some way.

Recovery can be a slow process and for some, recovery does not seem possible. It becomes a process of adapting to new or changed circumstances and learning to live a life of value in a different way than before and this can be the hardest form of recovery. But we never forget.

A resilient community is characterised by acts of comradery, togetherness, lending a hand to neighbours and the surrounding community. Rather than focusing on these opportunities during and following events, resilience is built by maintaining connections and relationships as part of our every day. Sharing time and knowledge with others, providing assistance to those who need it and volunteering are great opportunities to build strong, resilient community foundations.

Following the Monsoon Trough event, community members across Townsville with the know-how to help lend a hand to those whose homes had been inundated without insurance, repairing damage to enable families to move back in. Many families were able to resume life in their home to an acceptable standard of living, lessening the impact of not only the event itself but the distress that followed.

Our challenges lie in the increasing population migration which brings new residents from a diverse range of backgrounds. New residents provide opportunity for our region to continue to grow and prosper, but we must ensure that they understand their risk.

Economy

Townsville hosts a range of established industries such as defence, mineral processing, engineering and tourism, as well as having established health and knowledge facilities. There are on-going opportunities to expand these established industries as well as develop emerging sectors, such as renewable energy.

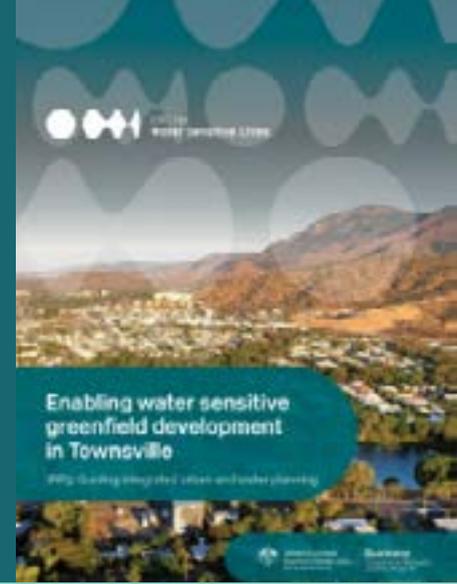
The region's continued economic diversification supports a variety of industries and areas of employment and is a key factor which underpins Townsville's liveability. From resource processing to agriculture, professional and community services and education and research, the economic base of the region continues to advance.

The Townsville City Deal, first announced in 2016, is a 15-year investment program that focuses on job creation, economic growth, investment in local infrastructure, a revitalised urban centre, and a more vibrant and liveable city. It seeks to deliver this via seven key initiatives:

- the capital of North Queensland
- international education and training
- industry powerhouse for the north
- innovative and connected city
- defence hub
- port city
- enabling infrastructure.

Recovery from the 2019 Monsoon Trough event from an economic perspective has had the added complexity of the emergence of the COVID19 global pandemic. Notwithstanding, continued expansion projects at the Port of Townsville as well as other major projects including Copper String 2.0 continue to underpin the economic strength of not only Townsville but the wider North Queensland region.

Townsville has opportunities to further develop and enhance its advanced manufacturing capabilities, including agricultural technologies, advanced metal production, food transformation and defence industries. The health sector will also see significant growth in Townsville, with the Townsville University Hospital forecast to require an additional 70 per cent in bed numbers to 2041.



Case study: Banfield Drive seawall, Palm Island

Palm Island Aboriginal Shire received almost \$800,000 in betterment funding to build a seawall along a section of Banfield Drive adjacent to the mouth of Palm Valley Creek.

Banfield Drive is the main road connecting the airport and Butler Bay areas with the rest of the Palm Island community.

The road was closed for five days after the 2019 Monsoon Trough floods after severe scouring to the road edge exposed a sewer main and left the road vulnerable to collapse.

Palm Island's Banfield Drive seawall project will ensure the road is more accessible and safer for users.

Works started on Banfield Drive in May 2021 and were completed in June 2021.

Case study: Enabling water sensitive greenfield development in Townsville

Over the next 20 years and beyond, Townsville will face water-related challenges and opportunities that provide impetus for a new approach to urban planning.

A collaboration between the CRC for Water Sensitive Cities and Townsville City Council has elevated the profile of water through the Vision and Transition Strategy for a Water Sensitive Townsville.

In addition to the abovementioned strategy, the 'Enabling water sensitive greenfield development in Townsville' report examines the institutional arrangements, particularly planning and service delivery functions, that can impede water sensitive urban development practices.

The analysis proposes a multi-pronged program of intervention for Townsville that spans across strategic leadership at the state and local levels, urban planning at the local level via the Townsville City Plan, and Council functions at the operational level. It identifies 14 opportunities to strengthen Townsville's planning and governance systems to advance its water sensitive agenda.

Case study: Townsville Community Rebuild Project

The Townsville Community Rebuild Project was a joint winner of the 2021 Community Award at the 2021 Get Ready Queensland Resilient Australia Awards.

This project was established following the 2019 North Queensland monsoon as a charitable, inter-agency initiative to assist residents who were unable to repair their flood affected properties.

The project aimed to 'make a house a home again' for many residents who could not repair their affected properties to a habitable condition because they were uninsured, vulnerable or ineligible for adequate government assistance.

The two-year project involved the coordination of 14 organisations to deliver services to over 47 households. It also facilitated emotional, social and psychological support to disaster-affected residents.

Image: Banfield Drive sea wall, Palm Island. Courtesy QRA.

Image: Enabling water sensitive greenfield development in Townsville cover. Courtesy Cooperative Research Centre for Water Sensitive Cities



Our exposure and risks

A critical element in understanding risk are the elements of exposure and vulnerability which exist at both micro and macro scale. For example, specific bridge or culvert assets may be exposed or vulnerable to natural hazards however, the resupply network these bridges and culverts support may then also be vulnerable. From a resilience perspective, it is necessary to consider 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 Palm Island and Townsville. The following observations are drawn in large part from the 'process one' analysis of each hazard using the QERMF approach across each local government area.

Cyclone, severe storm and coastal hazards

Palm Island

Palm Island is located in an area of severe tropical cyclone influence and has a history of significant events impacting the island, particularly during the December to April storm season.

The ability of buildings and residences to withstand significant wind speeds is particularly relevant in considering the vulnerability of cyclones and severe storms. This also extends to the ability of critical infrastructure networks, namely powerlines and mobile phone towers to withstand damage. Additionally, isolated camps on the islands could be vulnerable to the effects of severe wind during a tropical cyclone or coastal low.

Tropical cyclones and coastal lows also drive coastal hazards and increase the risk of storm surge which is one of the most significant concerns for Palm Island, and a risk for which Council has undertaken considerable studies to date. The foreshore area on the western side of the island is particularly vulnerable to storm surge considering the extent of development in this area. Critically, the cemetery may be subject to storm surge during certain events.

Currently Palm Island experiences wind gust speeds on average akin to a Category 3 cyclone of up to 46.3 metres per second which is expected to increase from 2041 to 58 metres per second which remains a Category 3 event.

Image: Reef HQ Aquarium, Townsville. Credit: Shutterstock.

Townsville

Severe Tropical Cyclone Yasi was a Category 4 when it made landfall north of Townsville between Cardwell and Innisfail in 2011. While the eye of the cyclone did not fall over the region, it brought with it destructive winds across the region and flooding in Townsville. Significant damage was reported as a result. The cyclone produced severe sea inundation with peak levels at Townsville's tide gauge measuring close to the expected 0.6 metre highest astronomical tide level, which inundated parts of the city.

Notable other tropical cyclones that have made landfall in the region include:

- 1971 – TC Gertie (Category 1)
- 1971 – TC Althea (Category 3)
- 1973 – TC Una (Category 2)
- 1990 – TC Joy (Category 2)
- 1997 – TC Justin (Category 1)
- 2000 – TC Tessi (Category 2)
- 2014 – TC Ita (Category 1).

Currently Townsville experiences wind gust speeds on average akin to a Category 3 cyclone of up to 53.2 metres per second which is expected to increase from 2041 to 63.9 metres per second or a Category 4 event (QFES, 2021).

Townsville City Council has undertaken a comprehensive Coastal Hazards Adaptation Strategy to consider the potential impact scenarios of a range of coastal hazards, including the effects of climate change. Townsville was the first pilot region to undertake such a study in Queensland.

The region's coastal hazards are commonly associated with weather systems such as cyclones, lows, troughs and severe storms. Coastal hazards include storm tide and storm surge, coastal erosion and sea level rise. It can also take in broader issues such as ocean acidification and warming which bring a range of direct and cumulative environmental and economic impacts.

Remembering that our coastlines are dynamic and constantly shifting, Townsville City Council has delivered a series of innovative and highly effective coastal foreshore regeneration and restoration projects.

A big issue for exposure to coastal hazards is how we continue to build broader community knowledge with regard to the function of the coastal environment and what we can do as a community to better protect it.



Flood hazard

Palm Island and Townsville share commonalities in relation to the dynamics of flood impact, with complex fast-run and highly responsive catchments which experience not only riverine and creek flooding but overland flow and localised flood impacts. This makes every flood event different in different parts of our region.

Palm Island

Palm Island is well accustomed to heavy downpours and storms, particularly during the summer months. During these storms, flooding can occur in the form of overland flow, which occurs as water collects and runs across the land.

The Palm Island town centre is not inundated during a flood although, a large proportion of the road network is. This can lead to isolation, making it difficult for residents to get around the island and access essential supplies and services.

The north-eastern end of the airport runway as well as access to the airport are affected by flooding. The airport is a vital asset, assisting in providing access to the mainland for re-supply and evacuation.

In addition, there are some areas of exposure to flooding to the south of the town centre, around Palm Valley Road.

Flooding also affects a number of houses in the northern part of the island between Coconut Grove Road and the two main dams. These dams can both spill during a flood leading to further inundation.

Flooding also affects a number of community facilities and health care services on the island.

Townsville

Flooding is a natural partner of cyclone events, but can also be caused by low pressure systems and monsoon troughs. Flooding represents Townsville's most common or probable risk. Key catchments in the region include the Houghton, Ross, Bohle and Black River catchments. These catchments are supplemented by a series of creek tributaries and sub-catchments such as the Louisa, Bluewater and Crystal Creeks. Together, and in conjunction with overland flow, these systems can generate complex flood behaviour depending on the nature and location of rainfall.

To aid understanding and forecast potential flood impact, these catchments are equipped with flood warning infrastructure, providing a network of data and intelligence to provide warning and support strategic and disaster management decision making.

Commonly known as 'flood gauges', this infrastructure is pivotal in supplying information for community, government and infrastructure and service providers on aspects of flood velocity, depth and timing. Understanding what different flood heights at the local gauge mean for our properties can help inform the decisions we need to make, and when.

A key challenge for flood forecasting in Townsville is the integrated nature of its coastal catchments which means that localised flood effects such as creek and overland flow flooding can interact with riverine flooding to vary the local flood extent. Added to this is the sediment-laden nature of the region's waterways, with dispersive soils and eroding catchments shifting sediment downstream and altering the bathymetry of rivers and creeks. Year on year, this can also lead to changes in the potential flood extent. Hence the importance of remembering these are dynamic systems which have continued to shift and change over many thousands of years.

In 1998 a low pressure system settled over Townsville producing intense rainfall that led to major flooding. Bluewater Creek and Black River responded very quickly to the torrential rain causing flash flooding in Townsville and surrounding areas, with floodwaters metres higher than previous records. Major flooding occurred in large areas of city with significant damage to businesses and houses in Thuringowa.

In early 2019 the North and Far North Queensland Monsoon Trough event brought an exceptional amount of rainfall to Palm Island, Townsville, and north and north-west Queensland. The heaviest rainfall was recorded in the Townsville, Bluewater and Paluma areas which broke long-standing records with areas receiving more rainfall in a week than would usually be experienced annually. The resulting damage included over 2,000 properties flooded in Townsville, and three deaths as a result of flooding, and two deaths which were indirectly related.

Other notable flood events that have affected the Palm Island and Townsville region occurred in 1960, 1965, 1972, 1989, 2007, 2008, 2009, and in 2010.

The rainfall during the 2019 Monsoon Trough event exceeded a one per cent Annual Exceedance Probability (AEP) (commonly known to as a 1 in 100 year event). The projected impacts of climate change means such events are likely to become more frequent.

Townsville's transition to a water sensitive city brings benefits not only for planning and design for flooding, but heat mitigation and more sustainable environmental outcomes.



Bushfire and grassfire hazard

Palm Island

Fire is both a tool and natural element of the Palm Island landscape. Bushfire however can be symptomatic of insufficient fire, recognising that Country needs people and people need Country. Separated from the mainland, Palm Island has avoided the major bushfire events to date but ignitions do occur.

Bushfire is a lower, but not insignificant risk on Palm Island. The nature of bushfires make them more difficult to predict, but with changing climate projections indicating hotter and drier weather, it is anticipated that risk will increase, particularly during prolonged dry periods and as vegetation changes to adapt to a changing climate.

Palm Island includes substantial areas of eucalypt forests, particularly in the northern part of the island and surrounding the urban areas including the airport. Eucalypt forests have a higher potential fuel load which, at the interface of settlements, can provide an elevated hazard.

The telecommunications network on Palm Island appears particularly vulnerable to bushfire with all mobile phone towers located in identified bushfire prone areas. Other critical infrastructure networks including the airport, power, water supply and wastewater may also be vulnerable.

Additionally, a large proportion of the local road network is exposed to potential bushfire hazard which can create significant difficulties in terms of evacuation and access for emergency services.

Fire in the landscape is critical to some ecosystems and is key to maintaining healthy Country. More landscape fire applied using indigenous knowledge is a prime opportunity for bushfire resilience.

Townsville

Vast areas of the Townsville region are mapped as subject to bushfire hazard. The dry eucalypt forests and woodlands which surround the city make the threat of bushfire a natural partner.

Bushfire across the region occur almost every season, some worse than others and often associated with periods of prolonged drought or intense heat.

Grassfire is also a significant risk, particularly in the rural and urban interface areas of the region. Grassfire hazard can be inadvertently underestimated, and can generate fast-moving fires that are of an intensity capable of causing damage and loss not only to property and equipment, but crops and fodder also. Whilst fodder is a valuable economic asset, grassland fire, when applied at the right time and under the right conditions, can generate improved pasture growth and health.

The exposure of roads, bridges and infrastructure is present across the region, presenting risks to assets as well as for people and evacuation processes.

Using fire as a land management and hazard reduction tool forms a key component of bushfire risk management plans for public lands and conservation estates across the region. Prescribing fire in accordance with appropriate fire regimes is critical, ensuring ecosystems are not burnt too often, or not often enough, noting that too frequent or infrequent fire can harm our sensitive ecosystems.



Earthquake hazard

Both Palm Island and most of Townsville is located within Seismic Hazard Source Zone 29. The Queensland State Earthquake Risk Assessment identifies the region is exposed to a 41.03 per cent probability of a 5.35 magnitude earthquake occurring over the next 100 years.

Damage to infrastructure, including water, sewer and electricity facilities can yield significant and cascading effects in terms of availability of water, sanitation and public health and disease. Impact to buildings and housing stock is also possible.

Any damage that occurs on Palm Island is also exacerbated by the ability to repair that infrastructure due to the island's relative isolation from the mainland.

Whilst earthquakes are a rare event for the region, they have occurred in the past. The 1913 Ravenswood earthquake in the Charters Towers region is the most notable historical event, measuring 5.7 on the Richter scale.

Other events have occurred in the Charters Towers region in the last decade, causing damage to the region's underground water and sewer network. Townsville and Charters Towers are positioned in the same seismic zone, so earth tremors cannot be discounted. Where earthquakes occur off the coast, there is the added risk of tsunamis.

Landslide hazard

Complex terrain and exposure to periods of intense rainfall, makes Palm Island susceptible to land slippage in certain locations.

Landslide hazard and risk is also present in locations across the Townsville region, including the areas of Castle Hill, Mount Louisa, Mount Stuart and Magnetic Island. Events have occurred in each of these locations in the past, impacting properties and blocking residential roads for some periods.

Landslide risk is higher following rain events, and possibly earth tremors. Soil type and vegetation cover also play a role in the susceptibility of landslide and land slippage events. Detailed hazard studies which form part of planning schemes helps to identify potential hazard locations, triggering more detailed geotechnical investigations to be undertaken.

Image: Palm island. Credit: Shutterstock.

Heat and heatwave hazard

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 heatwaves days and longer and more intense events within northern and eastern Australia.

We experience our fair share of hot and humid weather, year round in the part of Queensland. Currently, around 18 days of the year are considered heatwave days. Under changing climate conditions, the number of heatwave days per year is anticipated to increase by an additional 30 to 51 days per year for Townsville.

On Palm Island current heatwave days are slightly fewer at 16 days per year and expected to increase by 11 day per year in the low scenario or as much as 37 additional days in the high temperature scenario to 2090.

It is anticipated that this will increase stresses on social and community services and could also impact infrastructure networks if they are not adaptable to prolonged periods of increased temperature.

It will be important that we care for our vulnerable populations who are more susceptible to the effects of hotter and more humid weather, including the ill, the elderly and the very young.

The urban planning and design of our cities can have a large influence on how we experience heatwaves, and mitigating the impact of urban heat. A commonly used solution to cool towns is by planting street trees.

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.

However, in our region where we can experience severe winds, street trees can create other risks during tropical cyclones and severe storms. We need to explore other urban cooling solutions which are fit-for-purpose in our climate and for our hazard profile.

On Palm Island and in Townsville, this could include passive design strategies such as solid shading elements, orientation according to breeze and wind directions and 'cool' walls, floors and rooves.



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 a wealth of existing studies, reports, plans and strategies. It also draws upon the strategic observations drawn from the initial assessment of exposure and vulnerability undertaken across the region.

This enables the consideration of both locally identified community needs and strategic vulnerabilities derived through risk informed information, 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 options or opportunities:

‘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 Palm Island and Townsville regions, the doing same, doing different and doing better model encompasses the following examples:

- continuing existing work, collaboration and partnerships across the region, and building on existing momentum achieved via recovery processes to date
- improving data capture and communication of risk via mapping projects, information access and communication, warning systems and resilience investment planning
- building an enabling environment for future success from social, economic and building and natural environment perspectives
- for Palm Island, doing differently processes will work toward identifying and harnessing opportunities for community-wide benefit
- for Townsville, it involves re-focusing efforts on adapting built environment outcomes to embrace and absorb natural processes, with a focus on environmental resilience through a water sensitive city.

Delivering over time

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 is a conceptual roadmap to understand key actions and investment priorities, and timing. It anticipates that stresses and shocks will continue to happen into the future – but the ‘trigger points’ determine intervention points over time (before and event, during, and after) for sustained socio-economic growth into the future.

The roadmap can be used to understand recovery and resilience priorities ahead of time, to ensure stakeholders are aware of the needs of the region which enables post disaster efforts to be targeted accordingly.

The roadmap approach 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.

Events are challenging but can also present opportunities for change so that today’s lessons can be retained and put to work for future benefit. In ‘blue sky’ conditions, other opportunities 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 and need will dictate prioritisation.

This theory has been applied in Boxes 1 and 2 overleaf to the unique circumstances of Townsville and Palm Island. Townsville has already employed the roadmap approach from recovery to resilience towards a **Future Ready Townsville**, while Palm Island has a roadmap to **Enable Prosperity**.

Future Action and Investment Priorities and Phasing

Figure 9. Improving our prosperity through resilience – conceptual roadmap (adopted from Joseph Fiksel).



Box 1 – The Resilience Roadmap: Towards a Future-Ready Townsville

Townsville is at an important point in its history. Several years on from an extreme and prolonged flooding event, Townsville has consciously made a step change to a more sustainable and resilient future.

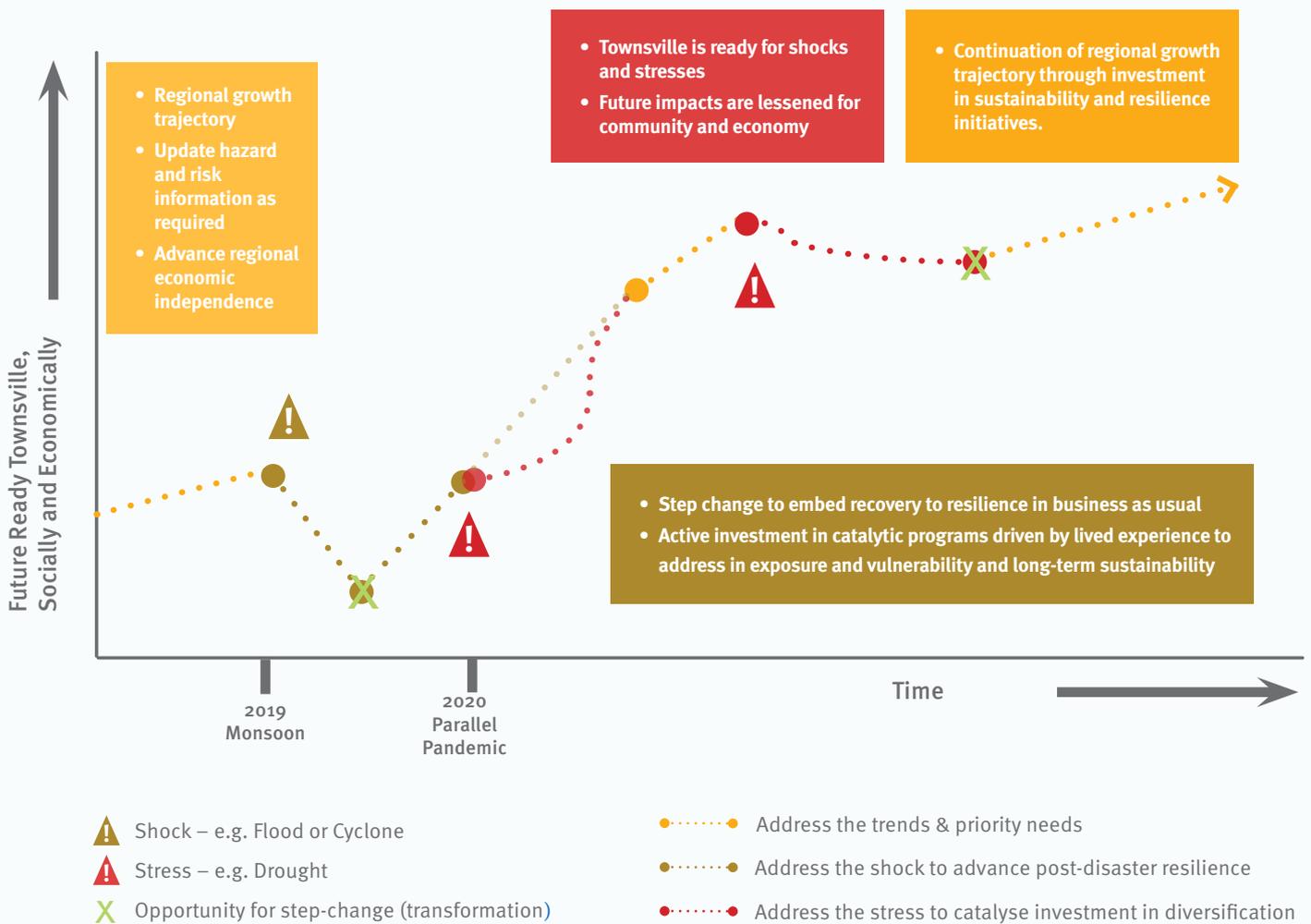
The trigger event has provided the conditions to take stock on what the future might hold. To reimagine a new, resilient pathway to a Future-Ready Townsville.

Recovery to Resilience, is a unique, but exemplary North Queensland roadmap which has recognised the opportunity to tie together existing strategic threads and reset the journey forward to prioritise active sustainable and resilient investment.

Key drivers, initiatives and enablers include:

- implementation and collaboration on the North Queensland Regional Plan
- the Townsville City Deal
- internal Council strategies:
 - Water Sensitive City
 - Flood Risk Management project
 - Floodplain Resilience Program, including development of the Total Flood Warning System
 - Coastal Hazard Adaptation Strategy
 - City Plan major amendments
 - Award-winning planning scheme indicators project
- the 2021 Corporate Plan highlighting new initiatives in circular economy and capitalisation on regional strengths.

Figure 10. The Townsville Recovery to Resilience Roadmap.



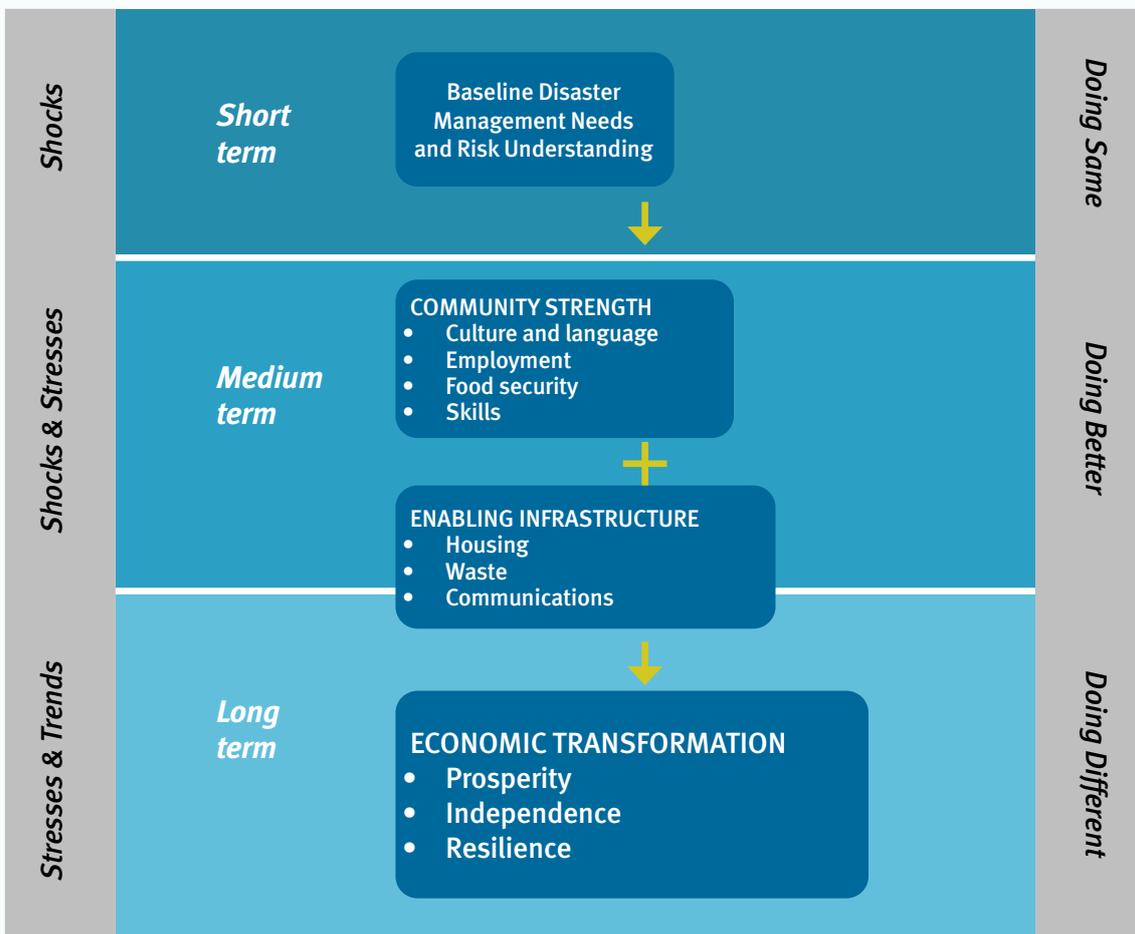
Box 2 – The Resilience Roadmap: Multi-Objective Disaster Resilience on Palm Island

Every community has its own recipe for resilience, as it means different things to different people and for different places. On Palm Island there is a sequential maturity roadmap that will underpin disaster resilience prosperity.

Box two below shows an example of the steps along a resilience roadmap for Palm Island resilience actions that contribute toward socio-economic goals that are less exposed to potential natural hazard and disaster impacts.

The maturity roadmap is a pathway that is dependent upon short-term shocks being considered and addressed which can be built upon to achieve medium-term strengthening. Once achieved, the next step of infrastructure is added to create the foundation of economic transformation. The achievement of a milestone allows the resilience step change to ‘doing better’ and ‘doing different’.

Figure 11. The roadmap to resilience for Palm Island.



Regional Strategic Pathways

The Australian Government 'After the flood: A strategy for long-term recovery' (After the Flood Strategy) sets out a series of focus areas and actions for long-term flood recovery. This Strategy aligns to the focus areas in that Strategy, and supplements this with pathways and actions for the other key hazards in the region.

The strategic pathways identified below form a 'blueprint' for coordinated resilience action for the North West region and complement the After the Flood Strategy objectives. Action and efforts at the local level are calibrated to work toward the achievement of regional goals, and the objectives of the After the Flood Strategy.

Each strategic pathway is mapped to its corresponding QSDR objective, referenced by coloured triangles.



	Resilience enhancement framework	Resilient landscapes	Resilient society	Resilient towns and infrastructure	Resilient economy	Resilient roads and transport
Palm Island	A sustainable enabling environment	Healing Country through traditional approaches, harnessing and building on-island capability 2	Improving our valued public spaces as community meeting points 3	Enhanced reliable baseline infrastructure assets, networks and services 4	Maximising utilisation of existing facilities for multi-purpose needs 3	A focus on road network resilience to flood and coastal hazards 1
	Leveraging opportunities	Building greater community participation in natural process stewardship through skills transfer and knowledge sharing 2	Enhanced community service offerings 3	Supporting greater access to digital networks and technologies to unlock new community and enterprise opportunities 3	Bolstering local employing through greater access to training and education opportunities within the community 3	Enhanced transport services and connectivity, bringing stronger connection with the mainland, including via sea and air travel 1
Townsville	Doing same	Environmental and hazard-based stewardship 3	Continuing to develop multi-hazard and risk literacy across the community 1	Incorporating disaster management considerations as part of strategic processes 2	Business continuity and planning for disruption as a foundation of sustainable enterprise 1	Improved repeated and potential impact road and rail hot spots, including for evacuation 1
	Doing better	Cooling our city and towns with solutions that are fit-for-purpose for our tropical climate and hazard profile 3	Broaden the focus on person-centred emergency preparedness concepts and grassroots, locally-led resilience 3	Collaborate across government and industry to contribute to sustainable insurance outcomes 2	Capitalise on innovation and technology opportunities 4 <ul style="list-style-type: none"> Climate responsiveness Economic diversification Energy production 	Enhancing outcomes for priority network modes, nodes and linkages, using multi-hazard approaches 4
	Doing differently	A focus on natural systems restoration, integration of natural processes and landscape sustainability 4	Explore new ways to contribute to cohesive neighbourhoods 2	Invest in innovative design intervention 4 <ul style="list-style-type: none"> Urban design Water sensitive urban design Infrastructure design Multi-purpose, multi-function assets 	Climate-conscious hazard and risk planning 3	Advance regional transport priorities that build disaster resilience and strengthen whole-of-region supply chains 4



Implementation

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 and Commonwealth agencies, local stakeholder groups, charities, NRM bodies and community groups.

Working together to implement the strategy

This strategy will be implemented as a partnership across the two local governments of the Palm Island and Townsville region. The strategy actions will be driven through local leadership and direction of each local government 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 Palm Island and Townsville 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 is intended to be at the direction of each local government with a strong link to other existing related governance arrangements such as the relevant DDMGs. An opportunity also exists to leverage advancement of this in collaboration with the neighbouring Burdekin and Charters Towers region under the stewardship of the NQROC.

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: Zinc processing facility, Townsville. Credit: Shutterstock.
Back cover: Palm Island. Credit: Shutterstock.*



www.qra.qld.gov.au/regional-resilience-strategies/townsville-palm-island