

# Lower Brisbane-Redlands Coastal Catchment Action Plan 2018 - 2021

May 2018

Resilient Rivers Initiative







### Traditional Owner Acknowledgement

The Lower Brisbane-Redlands Coastal Catchment Action Plan acknowledges the Traditional Owners, pays respect to Elders past, present and emerging, and recognises that the land, water and seascapes form traditional landscapes were spiritually and sustainably managed for thousands of years by Traditional Owners. The Catchment Action Plan recognises Traditional Owners including those who have been granted Native Title over land and sea Country and their active role in the ongoing management of cultural and natural resources; and the social, spiritual and economic future of communities.



*Dedicated to a better Brisbane*



# Contents

- Executive summary** 4
- 1. About this Action Plan** 6
  - Scope and purpose 6
  - Rationale for regional investment in the Lower Brisbane-Redlands Coastal Catchment 7
  - The Plan’s development process 8
- 2. The Catchment in context** 10
  - Overview of the Plan area 10
  - Climate 10
  - Modified catchments/urban development 10
  - Lower Brisbane Catchment 12
  - Redlands Coastal Catchment 14
  - Moreton Bay Islands 16
- 3. Policy and management context** 18
- 4. Catchment assets and services** 22
  - Catchment assets and services 22
  - Threats, issues and impacts 24
- 5. Risks and treatment actions** 27
- 6. Review** 32
- Attachment A: Investment prospectus for on-ground actions** 34



## Executive Summary

This Plan forms part of the Resilient Rivers Initiative, a collaborative effort between local and state governments, water utilities and key non-government organisations to improve the health and resilience of South East Queensland's catchments, rivers and Moreton Bay which are critical to ensuring our growing region's prosperity and its liveability well into the future.

The principal focus of the Lower Brisbane-Redlands Coastal Catchment Action Plan is addressing the impacts of stormwater runoff (primarily sediments, nutrients, hydrocarbons and metals) from urbanised areas—both existing, and those under development—on our creeks, Brisbane River, and Moreton Bay. As the population in South East Queensland continues to grow, our waterways are coming under increasing pressure, and therefore need proactive management to support the community's and the environment's needs, particularly in the context of changing climactic patterns.

The Brisbane River and Moreton Bay have together become one of the region's most important travel and transport corridors. The mouth of the Brisbane River has direct links to air, sea, road and rail networks, making it a global trade hub.

The catchment's drinking water supplies are also under pressure. Its many sources include dams, groundwater and other supply points in and out of the catchment.

It is those out-of-catchment sources that highlight the power of partnerships and leadership within the region.

Liveability is a high priority and preserving our natural assets is critical to upholding this value. The catchment offers a multitude of natural areas for residents and visitors to enjoy, such as Boondall Wetlands, Naree Budjong Djara National Park and Moreton Bay (Quandamooka). The catchment offers an abundance of waterway recreation, and with growing interest in enjoying our creeks, river and the Bay, it is important to ensure our waterways are safe, clean and accessible.

As well as their aesthetic and recreational value, these areas hold deep environmental, social and economic significance, and are important cultural places for Indigenous communities. The Quandamooka People have been recognised as native title holders of most of North Stradbroke Island, Peel Island, Goat Island, Bird Island, Stingaree Island, Crab Island and the surrounding waters of Moreton Bay.

The intact eucalypt forests in the west provide important soil cover, slowing down water movement through the catchment and providing flood and drought resilience. Mangrove forests that line waterways and shorelines in the east are important habitat for recreational and commercial fisheries—removing barriers to fish movement provides linear habitat connectivity, to further support recreational,

commercial, and traditional fisheries. These natural assets play an important role in building resilience across the catchment and hold significant economic potential as the ecotourism sector grows.

In order to secure the Resilient River Initiative's vision, this Plan provides an overview of the catchment's assets, threats and actions to mitigate the identified risks. The range of built and natural assets across the catchment presents a challenge for their effective management, highlighting the importance of both leadership and partnership to deliver a coordinated approach to successfully delivering the Initiative's vision of a "...resilient, productive, liveable and growing region." Table 1 outlines the recommended actions to be undertaken between 2018 and 2021.



**Table 1** Summary of the Lower Brisbane-Redlands Coastal Catchment actions to be undertaken between 2018 and 2021 (for more details see Section 5 and Attachment A.)

<b>On-ground actions</b>
1. Address bed and bank instability at 10 identified priority locations including bank stabilisation, riparian and in-stream rehabilitation, and weed management to keep soil on the land and improve water quality of creeks, the river and bay.
2. Manage geomorphic processes at strategic locations in Oxley Creek to ensure long term environmental outcomes.
3. Identify cost effective saltmarsh rehabilitation techniques to minimise damage to important saltmarsh habitats on Southern Moreton Bay Islands and mainland foreshore.
4. Demonstrate how stormwater treatment can be integrated into urban design to deliver multiple benefits such as urban cooling and social amenity, using case studies (eg. Pallara).
5. Reinstate fish passage at three priority locations, as ranked in the 2016 Greater Brisbane Fish Barrier Prioritisation Study, to build resilience into native fish populations.
6. Establish six partnership projects to share knowledge, expertise and leverage funding to improve waterway management outcomes across the catchment.
7. Enhance existing Erosion and Sediment Control regulatory activities (including monitoring, auditing, reporting compliance and education using a risk-based approach) to minimise environmental impacts from approved developments and activities.
8. Deliver the SEQ Erosion and Sediment Control and Urban Stormwater Capacity Building Program in priority locations through training and demonstrations for council officers and industry.
<b>Policy and planning actions</b>
9. Embed updated SEQ Environmental Values, Water Quality Objectives and accompanying aquatic ecosystem mapping under the Environmental Protection (Water) Policy 2009 into local planning schemes.
10. Clarify the regulatory framework for the sustainable management of shallow groundwater aquifers to support waterway health, wetlands groundwater recharge to protect water security.
11. Build towards a greater body of knowledge of surface and groundwater resources on North Stradbroke Island to better inform water resource planning by identifying existing data and assessing data gaps, and establishing a centralised data collection, storage and sharing framework.
12. Identify Indigenous landscape values (both with Native Title and without) using the Department of Environment and Science's ecosystems service manual for appropriate inclusion of Indigenous landscape values in catchment and land management activities.
13. Ensure the Queensland government's waterway management technical guideline (under development) is appropriate for urban waterway restoration designs and recognises Indigenous landscape values (identified in action 4).
14. Establish an agreed framework to ensure regular Lidar surveys are performed and are suitable for the purposes of catchment planning (e.g. roles, funding, frequency).
15. Undertake detailed mapping and condition assessment of sub-tidal and intertidal wetlands for restoration and protection planning to reduce coastal erosion and impacts of climate change.

# 1. About this Action Plan

## Scope and purpose

The Lower Brisbane-Redlands Coastal Catchment Action Plan 2018–21 is the fifth plan prepared as part of the Resilient Rivers Initiative, which has the following 30-year vision:

***“By 2045, the catchments of South East Queensland will support a resilient, productive, liveable and growing region.”***

This initiative is a collaboration between local and state governments, water utilities and key non-government organisations to improve the health and resilience of South East Queensland’s catchments, rivers and Moreton Bay. The Resilient Rivers Regional Strategy (2015–25) has four goals.

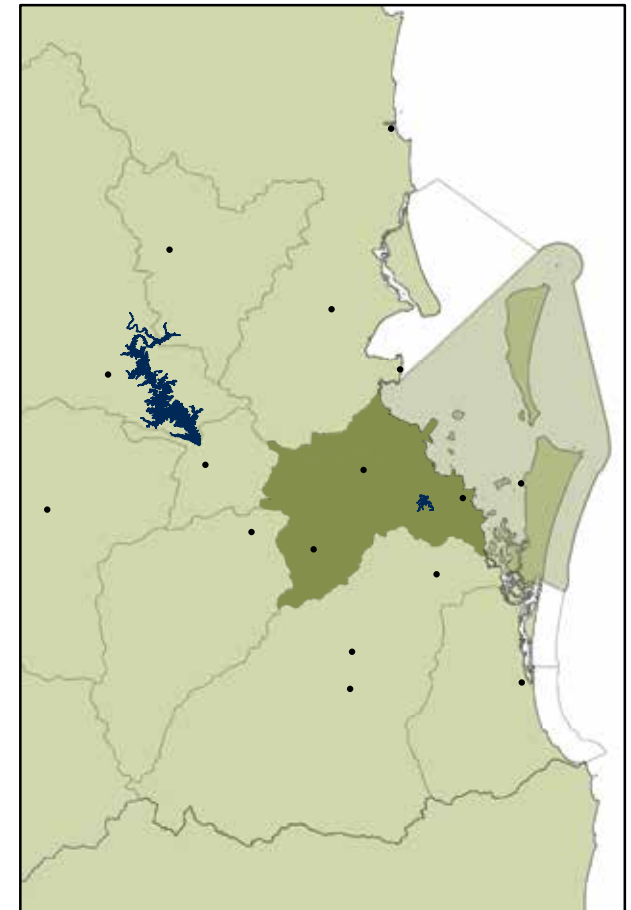
1. Keep soil on our land and out of our waterways.
2. Help protect our region’s water security.
3. Improve the climate resilience of our region.
4. Promote partnerships with strong leadership to deliver a Provides prioritised actions to achieve the Resilient Rivers Initiative vision based on the best of our knowledge coordinated approach.

The actions identified in this Plan contribute to achieving these goals. They have been developed in partnership with key stakeholders and use existing regional and local planning frameworks.

Achieving the 2045 vision requires a multi-faceted and collaborative approach for the heavily urbanised waterways of the Lower Brisbane-Redlands Catchment. Investment is needed in both upstream catchments (Lockyer and Mid-Brisbane), and lower, coastal catchments (Brisbane-Redlands) to enable this approach, and is vital to support a resilient, productive, liveable and growing region.

This Catchment Action Plan:

- Provides prioritised actions to achieve the Resilient Rivers Initiative vision based on the best of our knowledge and understanding, and reflects the values of the key stakeholders.
- Identifies actions to mitigate risks in the Catchment within the context of the Resilient Rivers Initiative.
- Helps with preparing strategic and prioritised investment to deliver on the identified actions.
- Aligns with existing regional and local plans.



**Location of the Lower Brisbane-Redlands Coastal Catchment**

## Rationale for regional investment in the Lower Brisbane-Redlands Coastal Catchment

The Lower Brisbane-Redlands Coastal Catchment sits within one of Australia's most desirable and fastest growing regions, with an expanding urban footprint and higher density development. The Brisbane River, as it loops through the central business district, is key to Brisbane's global identity and brings the natural world right into the heart of the city. The river also borders the South Bank precinct, a globally significant arts, culture and entertainment destination.

The catchment is highly urbanised and is home to a growing new world city with a range of economic hubs, priority global precincts and industrial parks. The river is an important travel corridor and, together with Moreton Bay, supports TradeCoast, a global export hub with world-class infrastructure. This includes the Port of Brisbane, Australia's third busiest port, which relies on the river and bay channels for its safe and efficient operation.

The Queen's Wharf and Howard Smith Wharves developments on the Brisbane River will become world-class riverfront destinations. The Oxley Creek Transformation Pty Ltd's 20-year vision will revitalise the Oxley Creek corridor, from the Brisbane River to Larapinta, into a world-class green corridor and leisure landmark for locals and visitors to experience local flora and fauna.

Brisbane and Redlands are the gateway to Moreton Bay and its islands. The catchment is highly valued for its sub-tropical coastal lifestyle, which is further enhanced by the visual beauty and the ecological value of the waterways, foreshores and Moreton Bay.

Moreton Bay and its islands are a unique natural ecosystem with biodiversity that supports a growing ecotourism industry. The bay receives more domestic tourists than the Great Barrier Reef<sup>1</sup>. Complementing this is a unique and rich cultural heritage with the Quandamooka people, who hold Native Title with land and sea connections.

All waterways within the catchment flow into the Ramsar-listed Moreton Bay. Moreton Bay in its entirety contributes economic value and benefits to South East Queensland through industry, tourism, recreation and fishing.

The river's banks and the bay's foreshores are gathering places; the water our playground; the islands a holiday destination as well as the spiritual home of Quandamooka people. Our creeks, river, waterways and bay are the places locals and visitors choose to meet, play and celebrate festivals and events.

Investment in the Lower Brisbane-Redlands Coastal Catchment will ensure the area continues to maintain

its green, liveable credentials while supporting a growing economy. Protecting Moreton Bay, one of the region's greatest natural and economic assets, is critical to meet our international Ramsar commitments. For these reasons, Moreton Bay and its islands have been nominated for listing as a World Heritage site.

Investment in the Lower Brisbane-Redlands Coastal Catchment Action Plan will:

- Protect internationally and regionally important waterways and wetlands.
- Ensure priority infrastructure is resilient to floods, droughts, storms and a changing climate.
- Enhance the region's liveability.
- Demonstrate partnerships and leadership to achieve regional benefits.

<sup>1</sup> In 2012, Moreton Bay Marine Park received 12.4 million domestic visits and the Great Barrier Reef Marine Park 8 million.

Queensland Parks and Wildlife Service community survey 2012 - visitation study, <https://www.npsr.qld.gov.au/managing/community-survey.html>

## The Plan's development process

The Lower Brisbane-Redlands Coastal Catchment Action Plan 2018–21 came about during the period from March 2017 to March 2018 through the collaborative efforts of representatives from the Council of Mayors (SEQ), Brisbane, Redland, Logan, and Ipswich City Councils, Seqwater, the Port of Brisbane, Healthy Land and Water Ltd, Queensland Urban Utilities, Redland Water, and the Queensland Departments of Environment and Science (DES), Natural Resources, Mines and Energy (DNRME), and Agriculture and Fisheries (DAF).

Brisbane and Redland City Councils provided project management support and coordination during the Plan's development.

**The process itself followed the five steps set out by the Resilient Rivers Taskforce.**

### Step 1:

Catchment description  
- compile catchment characteristics data and analysis report, and hold workshops to gather information for mapping to the online Walking the Landscape mapping.

### Step 2:

Catchment values and issues—identify assets and threats.

### Step 3:

Risks and treatment actions—identify risks to assets, and preferred treatments via stakeholder engagement and workshops.

### Step 4:

Prioritise actions—investigate the feasibility and likelihood of success.

### Step 5:

Publishing—finalise the action plan document and seek endorsement from collaborators.

The Lower Brisbane-Redlands Coastal Catchment Action Plan builds on existing studies and planning activities.

The Queensland Government's Wetlands Program provided invaluable data and consolidated the current understanding of the catchment processes occurring at the landscape scale. A number of other publications available from the Wetlands Program website - [wetlandinfo.ehp.qld.gov.au/wetlands/](http://wetlandinfo.ehp.qld.gov.au/wetlands/) - were also sources for the Plan.

The project team contracted environmental and water catchment specialist, LimnoLogic, to provide technical assistance in developing the Plan. This included revising the risk assessment framework, carrying out the risk assessment, identifying and prioritising actions for the Risk Treatment Plan, and providing input to the Catchment Action Plan.





## 2. The Catchment in context

This and following sections of the Plan are drawn from the Lower Brisbane and Redlands Map Journals, Brisbane's Total Water Cycle Management Plan, Redlands Catchment Description and Issues Technical Report, and ShapingSEQ 2017 which are primary reference sources. Sources other than these are referenced in the text.

### Overview of the Plan Area

The Lower Brisbane-Redlands Coastal Catchment Action Plan incorporates three distinct catchment areas: The Lower Brisbane Catchment, the Redlands Coastal Catchment, and the Moreton Bay Islands. The following section provides a separate overview of each sub-catchment, due to the varied geology, land uses, and values between them.

The combined Plan area is nearly 2 000 km<sup>2</sup>. The Lower Brisbane-Redlands Coastal Catchment spans five local government areas: Brisbane City at 58%, Redland City at 26%, Logan City at 8%, Ipswich City at 7% and 1% of Moreton Bay Regional Council's local government area.

All waterways within the catchment flow into Moreton Bay, a designated Ramsar site and Queensland Government Marine Park.

### Climate

The Plan Area has a sub-tropical climate, which is characterised by hot, humid summers, mild winters and high rainfall. Mean annual rainfall varies throughout the Plan Area (1 000–1 600 millimetres per year) but is generally slightly higher on the islands and over Mount Coot-tha.

South East Queensland is subject to extreme weather events such as heatwaves, droughts, floods, bushfires and severe storms. In the last two decades, Brisbane has experienced the Millennium Drought (1995–2009), two significant floods in the last ten years (2011 and 2013), as well as more frequent occurrences of severe storms and decaying tropical cyclones.

The future climate scenario is one of higher temperatures, longer dry periods and more frequent intense rain events.

### Modified catchments/ urban development

A significant proportion of this catchment is highly modified. Within a natural, forested catchment, most rain falls on hill slopes and vegetation. Vegetated hill slopes create minimal erosion. Vegetation stores the rain in soil, slowly releasing water over time which helps sustain flows of water during dry periods.

In a highly modified catchment, impervious or hard surfaces such as roads, buildings and roofs reduce the amount of rainfall that can infiltrate the ground, causing more runoff. This fast flowing movement of water is different to natural conditions and carries large amounts of sediment that can carry pollutants into stormwater drains and into waterways, which negatively impact waterway health, water quality and aquatic biodiversity.

Litter is also washed into waterways and is a serious pollution problem that affects our wildlife, aquatic habitats and water quality as well as the recreational use of our waterways. It is estimated that approximately 80% of all waterway litter originates from land-based activities.







## Lower Brisbane Catchment

### General description

The Lower Brisbane Catchment includes the main channel of the Lower Brisbane River and key tributaries such as Oxley, Bulimba, Enoggera and Breakfast Creeks. The Lower Brisbane River receives water from the Mid- Brisbane and Bremer River catchments. The catchment also includes a number of coastal sub-catchments to the north, Downfall, Nundah and Cabbage Tree Creeks and Kedron Brook, which flow directly into Moreton Bay.

### Hydrology and geology

The catchment covers approximately 1 195 km<sup>2</sup>, with around 2 475 km of stream network (third-order streams).

Brisbane's urban waterways are gravel and sand-bed rivers. Efforts to channelise many reaches by lining and straightening the originally sinuous channels have enhanced stream power in these reaches.

Channel instability and new suburban development is the most significant source of coarse sediment (sand and gravel) into urban creeks and Moreton Bay. Urban development also contributes suspended sediment (silt and clay) that can smother plants and animal communities and result in less sunlight striking the sea floor, affecting seagrass.

Most of the sub-catchments north of the Brisbane River support semi-natural forest on the steeper slopes of the western D'Aguilar Range. Suburban expansion mostly ceased 30 years ago in this area leading to lower sediment yields and more stable creek systems, with bank stability enhanced in many places by rock revetments.

The sub-catchments south of the Brisbane River feature low-gradient valleys and gently undulating topography with low rates of hillslope erosion. Ancient sediment that fills in valley bottoms is being eroded by channels destabilised through mining and by flash-flow, high-volume runoff. In particular, channel instability in Oxley Creek was initiated by gravel extraction, which artificially deepened the channel bed and altered the sediment transport regime. A series of floods has caused significant erosion that is migrating upstream.

### Land use

There is intensive land use—such as residential, commercial, services, manufacturing, industrial, transport and communication—across most of the catchment. There are smaller areas of rural residential and agriculture involving grazing, horticulture, horse studs and poultry farms.

Further infill development will occur throughout the catchment. Areas of new development include the state designated Priority Development Areas of Fitzgibbon, Bowen Hills, Herston Quarter, Northshore Hamilton, Queen's Wharf and Woolloongabba.

Many areas of the catchment are within the Brisbane River floodplain that is vulnerable to flooding. Flood levels are sensitive to in-filling, rainfall and sea level changes due to climate change.

### Value of the Catchment

Urban development and associated services (commercial, public, recreation and culture) are strong drivers of the local economy. It is estimated that by 2041, there will be a 53% increase in inner city jobs and a 33% increase in inner city residents.

Brisbane's city centre and major economic hubs such as Eagle Farm, Rocklea and Murrarie, make significant contributions to the local and regional economy. These locations are vulnerable to economic loss from shut downs associated with flooding.

The Australia TradeCoast Region is a unique 8 000 ha trade and industry precinct located at the mouth of the Brisbane River, with direct links to air, sea, road and rail networks, including the Port of Brisbane and Brisbane Airport.

Recreational use of Brisbane's local waterways injects over \$2.5 billion into the local economy each year and allows locals and visitors to connect to the natural environment enhancing their lifestyle and the liveability of the surrounding areas.

The catchment contains a number of protected areas, with the largest being D'Aguilar National Park, Boondall Wetlands and parts of the Moreton Bay Marine Park. The catchment also includes public nature refuges, conservation and natural areas.

The Brisbane River and the freshwater wetlands and creeks of the catchment provide habitat for important species, such as birds and platypus. Estuarine areas support many important species, including seagrass, mangroves, saltmarsh, migratory birds, fisheries species (crustaceans and fish), turtles, dugongs and dolphins.

The catchment has a rich Indigenous and European-heritage history. Today, the banks of the Brisbane River continue to have cultural importance, with South Bank, GOMA, the Queensland Performing Arts Complex and the Powerhouse all located along its banks. The annual Brisbane Festival, Quandamooka Festival and Riverfire all have international acclaim, and use the river or bay as a focal point.

Following the Millennium Drought in 2009, those who live in the catchment area have become enduring water savers. And since 2011, they have learned to live with floods, increasing their flood awareness and preparedness. These experiences have contributed to residents better understanding the water cycle and its impacts, in turn helping to build more resilient communities.



## Redlands Coastal Catchment

### General description

The Redlands Coastal Catchment is located to the southeast of Brisbane City. The catchment extends from the hinterland areas of Mount Cotton and Sheldon to Moreton Bay. The Redlands Coastal Catchment includes the Lota, Tingalpa, Coolnwynpin, Hilliards, Tarradarrapin, Eprapah, Moogurrapum, Weinam and Torquay Creeks. The catchment falls mostly within the Redland City Council boundary, but also include parts of the Brisbane and Logan City Council areas.

Leslie Harrison Dam on Tingalpa Creek is one of the 12 water supply dams in the SEQ Water Grid. The dam supplies about 25% of Redland City's drinking water, with the rest sourced from North Stradbroke Island's groundwater aquifer, and supplemented by the SEQ Water Grid.

### Hydrology and geology

The southwestern area of the city is dominated by the largely uncleared steep hills of Mount Cotton, which is 234 m at its highest point. The central areas consist of rolling hills, mostly cleared for agriculture, and rural residential land use. The lowland (floodplain) areas are flat and mostly urbanised. They give way to coastal flats, estuaries, tidal mangroves, wetlands, mudflats, and to Moreton Bay.

Redlands' western creeks have their headwaters in Mount Cotton and Mount Petrie and are characterised by high-velocity runoff in the steeper areas, especially in Upper Priest Gully (Mount Petrie) and the upper reaches of Tingalpa and Eprapah Creeks in Mount Cotton.

The central areas are underlain by large areas of sedimentary rock, and runoff from these areas flows into alluvium, underlain by impervious rocks, which supports wetlands and stream flow. Low-lying areas are characterised by large areas of alluvium along the channels together with Petrie formation (basalt) and swamps, which contribute the unique springs, creeks, wetlands and terrestrial vegetation found in this catchment.

### Land use

While large areas of remnant vegetation are still present across of the upper parts of some catchments, extensive clearing has occurred in the lower reaches to support agriculture and urbanisation.

Urban development is mainly focussed in the northern and eastern catchment areas, including the retail and commercial centres of Cleveland and Capalaba.

The western and southern catchments support a wide range of rural land uses including rural residential, grazing, poultry farming/processing, and horticulture, such as nursery operations, and fruit, flower and vegetable growing. There are areas of mining, including hard rock quarrying in the headwaters of Tingalpa Creek.

Redlands has two state-designated Priority Development Areas: Toondah Harbour and Weinam Creek. Areas zoned for new (greenfield) development include Kinross Road, South East Thornlands, and the Victoria Point Local Development Area.



## Value of the Catchment

Tourism is a major industry in the Redlands. Its sub-tropical climate, extensive waterway networks and access to the environmentally significant Moreton Bay, North Stradbroke and Southern Moreton Bay Islands attracts millions of visitors each year for pleasure and recreation.

The district and major centres accommodate a mix of uses, including community and employment services, retail and commercial, arts and culture, and education and health facilities. Other enterprise and industrial precincts, such as Cleveland and Capalaba industrial parks and the Redlands Business Park, provide further opportunities for industry and employment-generating activities.

The poultry industry forms a large portion of the agricultural sector and is located primarily in the southern half of the city. The fertile soils support a range of agricultural industries, including grazing, horse studs and horticulture. The extractive industry consists of the Karreman, Mount Cotton, and German Church Road Quarries.

Redlands' wetlands and creeks provide habitat for many important species, including migratory wader birds, wallum froglets, platypus and native jute. Estuarine areas support important mangrove, saltmarsh and seagrass habitats.

There are conservation and natural environments across most lower-lying areas, including large areas of mangrove forests and saltmarsh associated with Lota, Tingalpa, Hilliards and Eprapah Creeks.

The catchment contains a number of protected areas, such as Venman Bushland National Park and Daisy Hill Regional Park. The national parks, waterways and wetlands provide recreational activities, such as bush walking, cycling, bird watching, boating and fishing.

The Redlands has many significant sites of Aboriginal cultural heritage, such as stone artefacts, shell middens, scar trees, bora rings and sacred places. The Quandamooka people have been the traditional owners of the area for more than 21 000 years and currently have a pending Native Title claim over parts of the catchment, which include the mainland areas of Victoria Point, Redland Bay, Cleveland, Wellington Point and Capalaba as well as the surrounding waters of Moreton Bay.



## Moreton Bay Islands Catchment

### General description

Moreton Bay and its many islands extend 125 km from Surfers Paradise in the south to Caloundra in the north. Moreton Bay is bound to the east and separated from the Coral Sea by North Stradbroke and Moreton Islands, the second and third largest sand islands in the world respectively, behind Fraser Island further north. The catchment area includes western, central and eastern Moreton Bay, its foreshores and islands. Northern Moreton Bay, including Bribie Island and Pumicestone Passage, are not part of this catchment area.

### Hydrology and geology

Cape Moreton and Point Lookout, at the northeastern tip of Moreton and North Stradbroke Islands respectively, are the only rock outcrops. The geology for the remainder of the islands consists of coastal sand masses—high sand dunes, beach ridges and edge-of-basin sandstones. More than 170 freshwater lakes—dune, perched, and window lakes—and significant groundwater dependent ecosystems occur on the sand islands along with sedge dominated swamps. Mount Tempest is the highest point on Moreton Island at 285 m, and is thought to be the highest stabilised sand dune in the world.

Both islands are essentially large, vegetated dune systems, with rainfall filtering through the sand dunes to emerge in lakes and swamps and into Moreton Bay. There is very little surface runoff due to the high infiltration rate. Extensive meadows of seagrass occur on shallow sand and muddy sand flats in central and eastern Moreton Bay, providing habitat for fish and other marine species.

The Southern Moreton Bay Islands (SMBIs) are located to the east of the mainland within Moreton Bay. The total catchment area is 2 390 ha and includes Coochiemudlo, Macleay, Karragarra, Lamb and Russell Islands. Waterways on the islands consist of intermittent, undefined drainage lines that generally flow to wetlands, foreshore areas and Moreton Bay.

### Land use

Moreton Island, an area of approximately 18 600 ha, includes the townships of Bulwer, Cowan Cowan and Koorinal and falls under Brisbane City Council management. North Stradbroke Island, with an area of 26 937 ha, includes the townships of Point Lookout, Amity and Dunwich and, along with the Southern Moreton Bay Islands, is managed by Redland City Council.

Over 95% of Moreton and 50% of North Stradbroke Islands is national park. There are several large mining tenements across North Stradbroke Island. Some new residential development may occur on the island within the existing zoned urban areas.

While population growth is projected to be low for Moreton and North Stradbroke Islands, the population of the Southern Moreton Bay islands is projected to increase by up to 40% by 2036, likely achieved through additional residential development within the zoned urban areas.

### Value of the Catchment

Moreton Bay is a significant asset to the region, contributing economic value and benefits to South East Queensland through industry, tourism, recreation and fishing.

The mangrove forests and intertidal wetland areas provide important commercial fishing grounds for whiting, flathead, prawns and sand crabs.

Moreton Bay receives more domestic tourists each year than the Great Barrier Reef, with ecotourism a growing sector. The economy of Moreton and North Stradbroke Islands is driven by tourism and education. The sand mining on North Stradbroke Island is planned to cease in 2019 and a transition to ecotourism is underway

(North Stradbroke Island Economic Transition Strategy, 2016). Visitation to the Bay and Islands will be further enhanced by the eco-cultural initiatives developed by QYAC and the Quandamooka people.

Moreton Bay and its islands are home to many environmentally and culturally significant sites, habitats and species.

Quandamooka People have lived on the lands and seas surrounding North Stradbroke Island (Minjerrabah) for at least 21 000 years. The Quandamooka People's 2011 Native Title consent determinations cover most of North Stradbroke Island, Peel Island, Goat Island, Bird Island, Stingaree Island, Crab Island and the surrounding waters of Moreton Bay.

Moreton Bay provides habitat for more than 1 000 species of marine wildlife including fish, sea turtles, humpback whales, dolphins, corals and several threatened species, such as grey nurse sharks and dugongs.

The islands provide habitat for many rare and endangered species. The islands are a vital feeding and resting point for over 50 000 migratory waders and over 250 species of bird, including 34 migratory species listed under the China and Japan Migratory Bird Agreements. North Stradbroke Island has a complex network of wetlands that are also internationally recognised as Ramsar sites.

Moreton Island, a designated National Park, is the least disturbed, large coastal sand island in South East Queensland and has considerable value in its preservation of extensive stands of regionally significant coastal lowland vegetation communities, including mangroves, melaleuca swamps, sedgeland, heath and eucalypt woodlands, and open forests. North Stradbroke Island has a genetically distinct koala population.

Locals and visitors to the bay and its islands can participate in an extensive range of water-based recreational activities including fishing, sailing, power boating, whale watching, water skiing, parasailing, jet-skiing, sail-boarding, scuba diving, bird watching, marine study and snorkelling.





## 3. Policy and management context

The Resilient Rivers Initiative is taking a whole of catchment approach to waterway management that transcends local government boundaries. The organisations with a primary role in water and catchment policy and management interest in the Lower Brisbane-Redlands Coastal Catchment include Brisbane, Redland, Ipswich, and Logan City Councils, Moreton Bay Regional Council, the Queensland Government, Seqwater, Queensland Urban Utilities, Redland Water, and Healthy Land and Water Ltd. The community, along with Traditional Owners, are also important custodians.

### Local councils

Local councils invest in infrastructure asset management and recreational area management. These include managing council nature reserves and parks, providing stormwater infrastructure and planning for flood risk. Local councils also provide catchment management plans, have some devolved responsibilities such as local laws relating to on-site sewerage facilities, vegetation and pest management, and waterway pollution, including enforcing the State Planning Policy and Environmental Protection Policy. Councils have a major role in land use planning and asset management.

### Queensland Government

The Queensland Government is responsible for water security and water quality by setting policy direction and compliance.

The Department of Environment and Science (DES) has regulatory, policy and catchment management roles. DES regulates Environmentally Relevant Activities under the *Environmental Protection Act 1994* and is responsible for setting Water Quality Objectives and Environmental Values under the Environmental Protection (Water) Policy 2009. The Queensland Wetlands Program within DES provides information and tools including the “Walking the Landscape” map journals. DES also manages Moreton Bay Marine Park as a multi-use marine protected area under the *Nature Conservation Act 1992*. The object of the *Nature Conservation Act 1992* is the conservation of nature, while allowing for the social, cultural and commercial use of protected areas in a way that is consistent with the natural, cultural and other values of the areas.

The Department of Natural Resources, Mines and Energy (DNRME) is responsible for regulating activities under the *Water Act 2000*, including managing water allocation for irrigation and other purposes, and physical works within watercourses. This department works closely with Seqwater and DES.

The Department of Agriculture and Fisheries (DAF) regulates intensive livestock industries, horticultural industries, biosecurity, aquaculture, and commercial, recreational and indigenous fisheries throughout South East Queensland. Declared Fish Habitat Areas, waterways providing for fish passage, and marine plants are State Interests under the State Planning Policy and are managed under the *Fisheries Act 1994*. Compliance with Accepted Development Requirements or a Development Approval is required under the Planning Act 2016 for any development that involves impacts on marine plants, declared Fish Habitat Areas, waterway barrier works (fish passage) or aquaculture. There are several declared Fish Habitat Areas within the Moreton Bay area that recognise and protect the valuable contribution these areas provide to fisheries’ productivity in the region.

The Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP) administers the *Planning Act 2016* by co-ordinating the functions of infrastructure planning and policy, regional and local government planning and services, and economic development. The State Planning Policy—Water Quality sets the state’s policy direction for protecting and enhancing environmental values and quality.

## Seqwater

Seqwater delivers water supply to South East Queensland, as well as providing essential flood mitigation services and managing catchment health. Seqwater manages bulk water supply infrastructure, such as the SEQ Water Grid. In this catchment, Seqwater owns and operates Leslie Harrison Dam and numerous water treatment plants, reservoirs, pumps and pipelines.

Seqwater's Water Security Program is a 30-year plan to provide the region's drinking water, including during times of drought and flood. Version 2 was released in 2017 and includes a revised drought response plan and planning for all off-grid communities.

Seqwater aspires to achieve the United Nations' definition of water security:

'...the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human wellbeing, and socioeconomic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.' (UN, 2013)

## Water Utilities

Water is distributed, and wastewater collected and treated, in the catchment by Queensland Urban Utilities, and Redland Water (a commercial business unit of Redland City Council). These entities buy bulk water from Seqwater and operate under various Acts and policies, including:

- *South-East Queensland Water (Distribution and Retail Restructuring) Act 2009*
- *Water Supply (Safety and Reliability) Act 2008*
- *Environmental Protection Act 1994*, including the *Environmental Protection (Water) Policy 2009*.

This legislation includes standards for the operation of wastewater systems, such as licensed discharge criteria for protecting environmental values.

## Healthy Land and Water

Healthy Land and Water Ltd (HLW) is a not-for-profit organisation constituted by its shareholders to deliver activities that improve the sustainable use of land and waterways in South East Queensland. HLW's strategic vision is "healthy land and water supporting resilient regions". HLW operates via funding from federal, state and local government, industry, community, academics and utilities. HLW monitors and reports on



the condition of South East Queensland's waterways, develops plans and guidelines, and provides capacity building for professionals and community groups.

### **Port of Brisbane**

Port of Brisbane is managed and developed by the Port of Brisbane Pty Ltd under 99-year leases from the Queensland Government. An economic gateway driving the state's trade growth, the Port handles almost \$50 billion in international trade annually. The Port operates in an area of high environmental significance adjacent to Moreton Bay at the mouth of the Brisbane River. Operations are underpinned by an internationally accredited Environmental Management System, and a strong record of balancing environmental responsibilities with sustainable trade growth.

### **Quandamooka Yoolooburrabee Aboriginal Corporation**

The Quandamooka Yoolooburrabee Aboriginal Corporation (QYAC) is the Registered Prescribed Body Corporate to manage the recognised Native Title rights and interests of the Quandamooka people. QYAC is also the registered Cultural Heritage Body under the *Aboriginal Cultural Heritage Act 2003 (Qld)*. QYAC through the Quandamooka Aboriginal Land and Sea Management Agency is responsible for

planning, managing and protecting the Quandamooka Estate, which includes freehold land, nature reserves, recreation areas and parks, marine waters, and the joint management of National Parks. QYAC also undertake land use planning on their "exclusive use" areas including stormwater infrastructure and flood risk planning. For more information, visit [qyac.com.au](http://qyac.com.au).

QYAC was involved in the development of this Catchment Action Plan however, views expressed in this document do not carry their agreement or endorsement of this plan.

### **Traditional Owners**

Maiwar is the traditional word used to refer to the waterway known as the Brisbane River and Quandamooka Country comprises the waters and lands of and around Moorgumpin (Moreton Island), Minjerribah (North Stradbroke Island), the Southern Moreton Bay islands and South Stradbroke Island. It includes the coastal parts of the mainland from the mouth of the Brisbane River to the Logan River and crosses the boundaries of four Queensland local government areas.

### **Community**

Those organisations with management responsibility for the river and bay work in partnership with residents, industry, and community-based organisations such as local Indigenous groups, land care and community catchment management groups to ensure waterways and catchments are managed sustainably. These individuals, businesses and groups provide information and support for delivering on-ground actions, including involving residents in citizen-science, encouraging WaterSmart actions and building awareness of environmental and cultural values of waterways, catchments and the Bay. In Lower Brisbane, the Brisbane Catchment Network is a not-for-profit organisation representing 11 member catchment groups to provide a unified voice, strategic direction and collaborative opportunities to maintain or restore our creeks and the Brisbane River.





## 4. Catchment assets and services

### Catchment assets and services

The Lower Brisbane-Redlands Coastal catchment covers a diverse range of both natural and modified environments that support a range of economic, social, natural and cultural assets. Catchment assets for this Plan were identified as being of regional significance, benefiting more than one local government area, and in the context of the four goals of the Resilient Rivers Initiative: Being affected by water quality, erosion and sediment, and/or extreme weather events (floods and storm surges), along with significant social, environmental and economic services. Table 2 details the Lower Brisbane-Redlands Coastal catchment assets and the services they provide.





**Table 2** *The Lower Brisbane-Redlands Coastal catchment assets and services.*

Regional catchment assets	Services provided
<b>Water supply, treatment and distribution infrastructure</b>	
<ul style="list-style-type: none"> <li>- Leslie Harrison Dam (Tingalpa reservoir); North Stradbroke Island groundwater resource and shallow aquifers used as alternative water supply (non-drinking water).</li> <li>- Water treatment plants and associated distribution infrastructure.</li> </ul>	Drinking water for the mainland and islands and non drinking water for a variety of uses such as industrial (cleaning, dust suppression), irrigation of sporting fields.
<b>Stormwater and associated infrastructure</b>	
<ul style="list-style-type: none"> <li>- Stormwater network infrastructure (modified and natural waterways).</li> <li>- Stormwater.</li> </ul>	Conveyance, treatment, flood mitigation, water supply (water harvesting, irrigation, agriculture and natural assets).
<b>Wastewater infrastructure</b>	
<ul style="list-style-type: none"> <li>- Western Corridor recycled water scheme.</li> <li>- Sewage treatment plants.</li> <li>- Sewerage network.</li> </ul>	Wastewater sewage management and treatment including sewage and trade waste, alternative water supply, conveyance.
<b>Transport and critical infrastructure</b>	
<ul style="list-style-type: none"> <li>- Airports (Brisbane, Archerfield, Amberley).</li> <li>- River/Bay infrastructure (Port of Brisbane, transportation corridor service).</li> <li>- State road and rail infrastructure/routes.</li> </ul>	Connectivity to critical services, global trade, transport, food security for the region.
<b>Economic hubs and Global Priority Precincts</b>	
<ul style="list-style-type: none"> <li>- Brisbane CBD, South Bank, Australia TradeCoast and regional economic centres.</li> <li>- Priority Development Areas, e.g. Queen's Wharf.</li> <li>- Major industrial areas: such as Rocklea, South West Industrial Park.</li> </ul>	Employment, knowledge centres, economic activity and industrial services, social connectivity, place-making.
<b>Natural assets</b>	
<ul style="list-style-type: none"> <li>- Waterways: creeks, river and Moreton Bay, coastal and freshwater wetlands.</li> <li>- Shallow aquifers and groundwater.</li> <li>- Terrestrial (including urban forest), subtidal and intertidal ecosystems.</li> <li>- Seagrass, salt marsh, coral and artificial reefs.</li> <li>- Rural and peri-urban agricultural alluvial soils.</li> </ul>	<p>Biodiversity, connectivity, flood mitigation, groundwater recharge, amenity, recreation, habitat, water supply, erosion protection, fisheries habitat (recreation, customary and commercial), urban cooling and shade, support groundwater dependent ecosystems.</p> <p>Productive soils, lifestyle, amenity, sediment reduction/capture.</p>
<b>Cultural and social assets</b>	
<ul style="list-style-type: none"> <li>- Indigenous cultural heritage.</li> <li>- European cultural heritage.</li> <li>- An engaged community/community as waterway custodians.</li> </ul>	<p>Cultural and spiritual values and wellbeing.</p> <p>Stewardship, on-ground actions, knowledge, partnerships, private land management.</p>



## Threats, issues and impacts

Access to safe water and sanitation and sound management of freshwater ecosystems is essential to human health, environmental sustainability and economic prosperity. The key threats to Lower Brisbane-Redlands Coastal Catchment's assets are similar to others in South East Queensland, namely population growth, extreme weather events, and land use change, particularly as our urban footprint increases. The Lower Brisbane-Redlands Coastal Catchment Action Plan identifies the following high-level threats in these categories, along with their potential impacts.

### Population growth

South East Queensland's population has consistently been Australia's fastest growing urban community since the 1980s, and is forecasted to grow further—from 3 million people in 2015 to 5 million people in 2041, with the population in the metropolitan region anticipating 40% growth in this time.

Threat or pressure	Impacts
<ul style="list-style-type: none"> <li>• Altered demand for surface and groundwater.</li> <li>• Increased demand for water supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced security of surface and groundwater supplies, impacting both water supply and ecological assets, such as groundwater-dependent ecosystems.</li> <li>• Reduced quality of surface and groundwater supplies due to pollution and contamination, such as saltwater intrusion into aquifers.</li> </ul>
<p>Urbanisation of waterways and land use change, including:</p> <ul style="list-style-type: none"> <li>• growing areas of impervious and hard surfaces, reducing infiltration and increasing runoff.</li> <li>• altered runoff and water-flow patterns.</li> <li>• increasing infrastructure and waterway barriers e.g. culverts, bridges, weirs and dams.</li> <li>• disturbance of acid sulfate soils.</li> <li>• impacts from land use practices, e.g. sediments from urban development, and pollutants from industrial areas, commercial land uses and runoff.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased stormwater runoff and poor water quality entering waterways, groundwater and Moreton Bay.</li> <li>• Erosion and sedimentation of waterway channels and wetlands; sedimentation of river transport and shipping routes.</li> <li>• Reduced amenity and loss of recreational opportunity.</li> <li>• Reduced economic productivity in some industries as a result of environmental degradation, e.g. the region's recreational fishing industry is valued at \$150 million, and the commercial fishing industry is valued at \$24 million.</li> <li>• Decline in the condition of aquatic environments, creeks, freshwater wetlands, estuaries and Moreton Bay.</li> <li>• Increased pest and weed species.</li> <li>• Degradation or loss of important cultural assets and/or spiritual values.</li> </ul>
<p>Increased pressure on stormwater and wastewater systems, including the cumulative impacts of:</p> <ul style="list-style-type: none"> <li>• stormwater and wastewater discharges.</li> <li>• septic discharges.</li> <li>• chemical spills and unauthorised contaminant discharges.</li> <li>• licensed industrial discharges.</li> </ul>	<p>In addition to those impacts listed above, stormwater and wastewater has implications on:</p> <ul style="list-style-type: none"> <li>• water quality for human health</li> <li>• surface water and groundwater contamination</li> <li>• assimilative capacity of natural waterways, which can reduce the resilience of these systems.</li> </ul>

## Extreme weather

Climate change is expected to amplify the frequency and severity of extreme weather events, and changes in temperature, rainfall and sea levels will impact our communities and natural systems as well as key sectors of the economy.

There is significant evidence from Australia and overseas of the role natural assets play in helping communities withstand extreme events and enhancing their resilience. Natural assets such as waterways, wetlands, forests and coastal systems can reduce physical exposure to natural hazards and mitigate their impacts by serving as protective barriers or buffers. Well managed natural assets can provide protection against common natural hazards, such as landslides, flooding, storm surges, wildfires and drought. Preventing their loss is significantly less expensive than having to restore livelihoods following extreme events.

Threat or pressure	Impacts
<ul style="list-style-type: none"> <li>• Increased frequency and severity of weather events—floods, droughts, heatwaves and bushfires.</li> <li>• Rising sea levels, increased storm surges, coastal erosion.</li> <li>• Increased water temperatures.</li> <li>• The cost of water treatment is impacted by the health of natural assets. High sediment loads such as those that occurred during the South East Queensland floods of 2011 and 2013 can threaten the short-term supply of drinking water to Brisbane.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for disruption to water supply, increased water treatment costs (alternative water from desalination costs approximately 10 times more to supply) and changes to water demand and supply.</li> <li>• Increased need for climate change adaptation and resilience to be included in water supply planning and asset management.</li> <li>• Increased risk of inundation from storms, tidal processes and environmental factors on critical infrastructure and major transport routes.</li> <li>• Excess sediment loads in navigable waterways affecting navigation maintenance regimes, for example, the Australia TradeCoast, which includes the Port of Brisbane, is a significant component of the supply chain servicing South East Queensland and the state.</li> <li>• Environmental degradation, including increased sediment and coastal erosion, negatively impacting habitat and aquatic species in waterways and Moreton Bay.</li> <li>• Reduced life span of coastal infrastructure due to rising sea levels; increased maintenance required.</li> <li>• Changes to ecosystems, including species loss and the migration of pest species, as a result of changed environmental conditions.</li> </ul>

## Land use

Around the world, valuable ecosystems are under pressure from urban expansion, agricultural clearing and the effects of climate change. In the metropolitan areas (including Brisbane and Redland local government areas), the number of dwellings is expected to increase by nearly 50% by 2041, comprising both consolidations in existing areas, and urban expansion to new areas (ShapingSEQ, 2017). As well as these growth pressures, land use practices of the past, present and future continue to impact upon regional assets.

Threat or pressure	Impacts
<ul style="list-style-type: none"> <li>• Inappropriate legacy planning decisions.</li> <li>• Inappropriate land use management.</li> <li>• Recreational impacts.</li> <li>• Vandalism and deliberate degradation.</li> </ul>	<ul style="list-style-type: none"> <li>• Decline in the condition of natural assets, including aquatic environments, fisheries, creeks, estuaries and Moreton Bay.</li> <li>• Increased pest and weed species.</li> <li>• Degradation or loss of important cultural assets and/or spiritual values.</li> <li>• Loss of diversity, culture and vibrancy associated with the area to support the high concentration of people and employment for the region, and the associated diversity in lifestyle and recreation opportunities.</li> </ul>





## 5. Risks and treatment actions

The Lower Brisbane-Redlands Coastal Catchment Action Plan Risk Assessment Framework was developed in accordance with the Resilient Rivers Taskforce guidelines on how to prepare a Catchment Action Plan, and AS/NZS ISO 31000:2009 – Risk Management Principals and Guidelines. The Risk Treatment Plan was developed in consultation with stakeholders through a series of workshops, meetings and written communications. Throughout the Risk Treatment Plan's development, the emphasis was identifying collaborative actions that promote partnerships, knowledge sharing and capacity building to complement and add value to existing plans, policies or programs. The on-ground actions for this Catchment Action Plan form the Investment Prospectus (Attachment A).

**Table 3**, the Risk Treatment Plan, sets out the high-priority actions recommended for the Lower Brisbane-Redlands Coastal Catchment over the next three years (2018–20). These actions focus on projects or policy that mitigate high risks and have a high likelihood of success. Actions are subject to funding and not limited to the possible implementation pathway listed.

Action #	Risk Treatment Actions	Risk/s and threats addressed	Possible implementation pathway	Benefits	Locations (where known)	Suggested timeframe
<b>On-ground</b>						
1	Address bed and bank instability at 10 priority locations through on ground works including bank stabilisation, riparian and instream rehabilitation and weed management to benchmark standard, where possible.	Impacts to water quality, waterway health and biodiversity due to riparian habitat deterioration, fragmentation and increased erosion.	Collaboration between BCC, RCC, LCC, ICC, Seqwater and community groups. Possible offsite stormwater treatment or nutrient offset funding.	Regionally coordinated planning and restoration. Improved waterway health and biodiversity. Provides community education and stewardship.	Sites to be confirmed in: Norman, Cabbage Tree, Wolston, Bulimba, Enoggera, Coolnwynpin, Erapah, Upper Tingalpa, Woogaroo Creeks and Priest Gully.	2018–20 (3 years)
2	Manage geomorphic processes at strategic locations in Oxley Creek to ensure long term environmental outcomes.	Impact to infrastructure, water quality, public health and waterway health upstream and downstream of erosion scour. Risk of significant channel incision and bank failure.	Partnership between BCC, Queensland Urban Utilities and the community. Possible offsite stormwater treatment or nutrient offset funding.	Stabilises banks and reduces sediment into Moreton Bay. Avoids costs to rectify from further deterioration and avoids damage to adjacent and downstream infrastructure.	Locations to be determined and may include Johnson Road, Larapinta.	2018–21 (4 years)

Action #	Risk Treatment Actions	Risk/s and threats addressed	Possible implementation pathway	Benefits	Locations (where known)	Suggested timeframe
3	Undertake trial of saltmarsh rehabilitation techniques (to benchmark standard) to address damage caused by vehicles, including vehicle exclusion barriers, revegetation and stabilisation	Deterioration of important saltmarsh habitats due to inappropriate recreation.	Collaborative project between HLW, RCC, BCC, QYAC and community	Improves saltmarsh habitat. Improves fisheries. Reduces mosquito breeding areas. Implements EPBC Act Recovery Plan.	Contributes to regional knowledge of building resilience. Locations to be determined, and may include Ormiston, Redland Bay, Russell Island and Moreton Island.	2018–20 (3 years)
4	Identify suitable areas, retrofit innovative stormwater solutions within a precinct and apply the Living Waterways approach to deliver on broader benefits of water sensitive urban design, such as urban cooling and social amenity through the use of emerging and innovative technologies.	Impact to water quality and waterway health from increased nutrient, sediment and contaminant loads from stormwater.	Partnership approach between local governments and developers with support from HLW and water utilities.	Urban cooling, place-making amenity and liveability. Fosters community stewardship. Reduces run off and improves waterway health. Provides flood mitigation and infiltration. Future opportunities to use stormwater as a resource.	Pallara, Thornlands and other appropriate locations, to be determined by stakeholders.	2019–20 (2 years)
5	Reinstate fish passage at three priority locations, as ranked in the Greater Brisbane Fish Barrier Prioritisation Study (completed 2016).	Impacts to fisheries due to reduced aquatic habitat connectivity and altered flow regimes.	Collaboration between DES, DAF, HLW, BCC and RCC.	Improves connectivity and native fish resilience. Allows important commercial, recreational and Indigenous fishery species to complete life cycle. Improves waterway health.	1. Fellmonger Park on Hilliards Creek, Ormiston. 2. Bancroft Weir, Hulme Street, Kelvin Grove. 3. Moggill Road, Kenmore.	2018–20 (3 years)
6	Establish six partnership (twinning) projects to share knowledge, expertise and leverage funding to improve waterway management outcomes across the catchment.	Impacts to water quality and waterway health due to riparian habitat deterioration and fragmentation.	Cross-organisational partnerships between BCC, RCC, LCC, ICC, HLW, QYAC and community groups.	Promotes partnerships. Avoided costs from sharing lessons learned. Enables remarkable alliances and a stronger regional network. Enables a resilient community.	Projects and partnerships to be determined. (Two per year.)	2018–20 (3 years)

Action #	Risk Treatment Actions	Risk/s and threats addressed	Possible implementation pathway	Benefits	Locations (where known)	Suggested timeframe
7	Enhance existing Erosion and Sediment Control regulatory activities (including monitoring, auditing, reporting compliance and education using a risk-based approach) to minimise environmental impacts from approved developments and activities. Includes erosion and sediment control during construction and stormwater quality improvement devices.	Threat to waterway health from rain running off construction sites and carrying sediment into waterways.	Partnership approach between local governments and developers with support from DES and HLW.	Keeps soil on land.  Addresses the source (urban development) of approximately 30% of the sediments reaching waterways and Moreton Bay.	Active development sites	2018–21 (4 years)
8	Deliver the SEQ Erosion and Sediment Control and Urban Stormwater Capacity Building Program in priority locations through training in and demonstration of best practice in erosion and sediment control using high-efficiency sediment basins for treating on-site stormwater runoff for council officers and industry.	Risk of impact to water quality and waterway health from increased nutrient, sediment and contaminant loads due to ineffective erosion and sediment control during construction activities.	DES in partnership with HLW, local councils to build knowledge and, with industry, to build awareness and capacity.	Shares knowledge of best practice Erosion and Sediment Control.  Builds capacity within industry.	Deliver training at the Healthy Land and Water/Redland City Council demonstration site and through training days and knowledge sharing in conjunction with local governments.	2018-2021 (4 years)
<b>Policy and planning</b>						
9	Embed updated SEQ Environmental Values, Water Quality Objectives and accompanying aquatic ecosystem mapping under the Environmental Protection (Water) Policy 2009 into local planning schemes.	Maintain and improve water quality.	Partnership approach between local governments and developers with support from DES and HLW.	Stating local water quality objectives to enhance or protect the identified environmental values.  Providing a framework for making consistent, equitable and informed decisions about waters that promotes efficient use of resources and best practice environmental management.  Involving the community through consultation and education.	Across Lower Brisbane-Redlands Coastal Catchment.	2019–21 (3 years)



Action #	Risk Treatment Actions	Risk/s and threats addressed	Possible implementation pathway	Benefits	Locations (where known)	Suggested timeframe
10	Identify key issues, information gaps and clarify the regulatory framework for the sustainable management of shallow groundwater aquifers to support waterway health, wetlands and groundwater recharge.	Threats to security of shallow groundwater aquifers for alternate supply and recharge of groundwater.	A committee with representatives from BCC, RCC, LCC, DNRME, DES, HLW and Seqwater.	Clarifies regulatory framework for managing groundwater resources. Increases understanding of key risks.	Apply the clarified regulatory framework in two land use management scenarios. 1. Leslie Harrison Dam Catchment (including Rochedale). 2. Oxley Creek Catchment.	2018 (6 months)
11	Build towards a greater body of knowledge of surface and groundwater resources on North Stradbroke Island to better inform water resource planning by: - identifying existing data and assess data gaps - establishing a centralised data collection, storage and sharing framework.	Threats to groundwater security on North Stradbroke Island.	Collaborative project between QYAC, Seqwater, DNRME, RCC, Redland Water and DES.	Centralises data collation and storage. Facilitates knowledge sharing. Provides more confidence in groundwater models and assessment of long-term risks.	North Stradbroke Island groundwater catchment.	2018 (6 months)
12	Identify Indigenous landscape values (both with Native Title and without) using the DES ecosystems service manual developed for appropriate inclusion of indigenous landscape values in catchment and land management activities.	Impact to Indigenous landscape values due to lack of information regarding cultural significance and management requirements.	Indigenous groups in partnership with DES and local governments (BCC, RCC, LCC and ICC).	Enables the consideration of Traditional Owner and Indigenous landscape values when developing projects. Fosters and strengthens relationships between traditional owners and local governments. Improves recognition of Native Title and cultural heritage legislative obligations when undertaking catchment management works.	Priority sites to be identified after developing the guide.	2018–20 (1–2 years)

Action #	Risk Treatment Actions	Risk/s and threats addressed	Possible implementation pathway	Benefits	Locations (where known)	Suggested timeframe
13	<p>Embed urban waterway management technical guideline (under development) into waterway restoration designs.</p> <p>Ensure the appropriateness for this catchment, that it builds on existing information, including the Streambank, in-channel and riparian rehabilitation guidelines DNRM 17102 (under development), along with recognition of Indigenous landscape values (action #6).</p>	Impact to water quality and waterway health due to land use change and creek-side habitat degradation.	<p>Collaborative project between DES, BCC, RCC, LCC, ICC and HLW.</p> <p>Building on the CRC for Sustainable Cities' riparian guideline and the DNRME guideline (under development).</p>	<p>Achieves better design outcomes for waterway management and restoration.</p> <p>Improves waterway habitat, water quality and climate resilience.</p>	To improve design outcomes on projects within the Lower Brisbane-Redlands Coastal Catchment.	2018–19 (12 months)
14	Establish an agreed framework to ensure regular Lidar surveys are performed (e.g. roles, funding, frequency).	Risk of outdated data informing management and policy decisions that may impact on human health, water quality and aquatic ecosystems, recreation, ecotourism and cultural heritage.	DNRME to lead mapping in consultation with DES, BCC, RCC, LCC, ICC and stakeholders.	<p>Provides land surface elevation data to support local planning and catchment management.</p> <p>Enables analysis of catchment changes over time (e.g. 2–5yrs).</p> <p>Multiplies uses of Lidar mapping for a broad range of stakeholders.</p>	Lower Brisbane-Redlands Coastal Catchment.	2018–19 (2 years)
15	Undertake detailed mapping and condition assessment of sub-tidal and intertidal wetlands. Classify wetlands using DES's existing methodology and assess risks to key habitats to inform coastal adaptation planning and wetland rehabilitation and restoration planning.	Deterioration of sub-tidal and intertidal wetlands resulting from climate change impacts, shoreline erosion, declining water quality, physical habitat destruction and altered flow regimes.	<p>DES to undertake detailed baseline mapping.</p> <p>RCC, BCC, QYAC and HLW to assist with assessing risks.</p>	<p>Provides information for managing and restoring important coastal habitat.</p> <p>Improves fisheries habitat.</p> <p>Informs coastal adaptation planning and resilience.</p> <p>Improves understanding of key climate refugia for coastal adaptation strategies.</p>	Brisbane River mouth and Moreton Bay (between SMBIs and Moreton Island).	2018–19 (2 years)

## 6. Review

### Emerging plans and strategies

The Brisbane River Strategic Floodplain Management Plan (BRSFMP) is due for release in 2019 and will provide a number of flood mitigation recommendations relevant to this catchment area. Following the completion of the BRSFMP and proposed Local Floodplain Management Plans, relevant authorities may consider integrating their recommendations into the Catchment Action Plan in three years' time to ensure a whole-of-catchment approach.

The recently released Queensland Sustainable Fisheries Strategy (2017–27) sets out the government's reform agenda for the next 10 years. This Action Plan has identified several projects that will contribute to sustainable fisheries management throughout the Lower Brisbane-Redlands Coastal Catchment. However, further work is needed to identify linkages and opportunities, particularly in relation to regional biosecurity and pest fish management and barrier removal works.

Ipswich City Council's updated Water Health Strategy is due to be released in 2018, identifying waterway and wetland actions and activities across Ipswich. These actions should be considered for inclusion in the next review of the Catchment Action Plan.

Ecotourism and the increasing recreational use of the river, bay and waterways may require a more detailed look into the public health risks when this Plan is reviewed in three years' time.

### Links with other Catchment Areas

The Brisbane River and Moreton Bay are heavily impacted by sediment and nutrient runoff from stream and gully erosion in the upper Brisbane River catchment. It is important that Catchment Action Plans in these regions adequately identify and address these issues to ensure any efforts in the lower Brisbane and Redlands area are not undermined.

The Mount Crosby Weir was ranked as the third highest priority in the recently completed Greater Brisbane Fish Barrier Prioritisation Study. Although not specifically located in the Lower Brisbane-Redlands catchment, installation of a fishway at Mount Crosby Weir would improve fish passage and provide multiple benefits throughout the lower to mid Brisbane River catchments. It is suggested that further opportunities to progress the installation of a fishway at Mount Crosby Weir be advanced where possible.

This Action Plan identifies a range of actions and stakeholders that contribute to the vision and goals of the Resilient Rivers Initiative. However, with no single lead to coordinate the delivery of actions, there is a

risk the actions will not be implemented in a strategic and coordinated way. The Resilient Rivers Taskforce is investigating governance options to support the delivery of prioritised actions, as well as those of other Catchment Action Plans in the region.

### Known land use changes

North Stradbroke Island is the only place in Queensland where an active mining lease exists over a national park and in May 2016, the Queensland Parliament passed legislation that will substantially cease sand mining on the island by 2019. To support the transition away from sand mining, the Queensland Government has developed an Economic Transition Strategy, which sets out the government's plan for transitioning the island to become an eco-tourism hub (North Stradbroke Island Economic Transition Strategy, 2016).

### Monitoring, reporting and evaluation

A monitoring framework to assess the outcomes of each action against the four objectives of the Resilient Rivers Initiative (e.g. tonnes of sediment reduced) will be established, including an evaluation to be conducted in 2019. Ideally, a Before-After-Control-Impact-style monitoring program for each action will enable project progress and reporting back to



stakeholders and investors. The monitoring should be developed in context with the other monitoring programs in the catchment (e.g. HLW's Environmental Health Monitoring Program) to ensure a full and thorough assessment of the success of each action.

This Action Plan and its supporting documents are due to be updated by June 2021 with relevant information that arises along with the opportunity to ensure all stakeholder values, including indigenous values, can be incorporated.



# Attachment A:

## Investment prospectus for on-ground actions

### Enhancing Erosion and Sediment Control

#### ***Enhance existing Erosion and Sediment Control regulatory activities (cost to be determined)***

Enhance existing Erosion and Sediment Control regulatory activities to minimise environmental impacts from approved developments and activities, including monitoring, auditing, reporting compliance and education using a risk-based approach. This may also include erosion and sediment control during construction and stormwater quality improvement devices.

This project aims to reduce the threat to waterways from rain running off construction sites and carrying sediment into waterways.

### Managing urban stormwater

#### ***Retrofit stormwater solutions. Scope two precincts (\$150 000); pilot site (\$800 000+ estimated)***

Managing stormwater within highly developed urban catchments can be challenging. The pilot will demonstrate best practice principles for retrofit stormwater management within two existing urban precincts, in alignment with the Living Waterways approach.

Each demonstration will provide examples of innovative stormwater solutions to achieve improved waterway health, urban cooling, increased amenity and flood mitigation. Opportunities for integrating stormwater systems that are aesthetically pleasing and reflect historical and cultural identity will also be trialled. Locations include Pallara, Brisbane (Oxley Creek Catchment), and Thornlands, Redlands (Erapah Creek Catchment).

### Restoring and rehabilitating waterways

#### ***Rehabilitate Priority Waterway Reaches (\$400 000-\$500 000 estimated)***

This program of works aims to rehabilitate ten priority waterway reaches, and reduce bed and bank erosion at priority locations. The work will include baseline condition assessments, weed management and rehabilitation of riparian and aquatic vegetation at identified sites to benchmark standard, where possible. Priority sites include Norman, Cabbage Tree, Wolston, Bulimba, Enoggera, Coolnwynpin, Upper Tingalpa and Woogaroo Creeks, and Priest Gully.

#### ***Manage geomorphic processes at strategic locations in Oxley Creek (cost to be determined)***

There is active erosion along reaches of Oxley Creek that is impacting water quality and waterway health. Some erosion presents a risk to nearby infrastructure due to the potential for further channel incision.

This project will develop a strategy for managing the geomorphic processes resulting in erosion in Oxley Creek. The project aims to monitor the risks to the channel and nearby infrastructure, and improve waterway health and environmental values.

### Improving native fish resilience

#### ***Reinstate fish passage at three priority waterway barriers (\$250 000- \$350 000 estimated)***

Waterway barriers such as culverts, pipes, road crossings, weirs and dams may prevent, delay or obstruct the migration of native fish, impacting recruitment and reducing fish populations. The Greater Brisbane Urban Fish Barrier Prioritisation Project identified and prioritised waterway barriers in the Greater Brisbane Urban Area. Reinstating fish passage will result in improved migration and recruitment of

several commercially and culturally important native fish species.

The project will remove or retrofit three of the identified high-priority waterway barriers. Potential locations include Fellmonger Park on Hilliards Creek (Redlands), Enoggera Weir (Bancroft Park, Brisbane) and Moggill Road (Brisbane). The project will improve waterway connectivity and native fish resilience, and allow important fishery species to complete their life cycle.

### **Protecting and rehabilitating coastal wetlands**

#### ***Trial of saltmarsh rehabilitation techniques***

Subtropical coastal saltmarsh communities, such as those present in the coastal areas of lower Brisbane and the Redlands, are listed as vulnerable under the Environment Protection and Biodiversity Conservation (EPBC) Act (1999). Saltmarsh is an important habitat for shorebirds and a nursery for fish and prawn species. It also plays a role in reducing erosion, maintains water quality and is a carbon sink.

This project will undertake baseline condition assessments of key saltmarsh habitats and trial a number of saltmarsh rehabilitation techniques to address damage caused by vehicles, including vehicle exclusion barriers and revegetation. Potential locations include coastal sites along the mainland and Russell Island; however the final sites will be determined in consultation with QYAC. The outcomes will improve saltmarsh and fish habitats, reduce mosquito breeding areas, and improve understanding of successful saltmarsh rehabilitation techniques.

#### ***Build capacity through collaborative waterway rehabilitation—twinning projects (\$300 000)***

Numerous catchment, Landcare and bush-care groups are actively involved in waterway management, education and rehabilitation throughout the Lower Brisbane-Redlands Coastal CAP area. The groups, coordinated through the

Brisbane Catchments Network, work in partnership with councils, government, the community, landholders and Healthy Land and Water to educate the community, encourage environmental stewardship and deliver on-ground restoration works. “Twinning” programs are similar to mentoring programs and aim to pair waterway management professionals, with the purpose of sharing information, building capacity and delivering specific waterway management projects.

The Lower Brisbane-Redlands Coastal CAP proposes implementing two twinning projects per year, over three years (six in total) to deliver waterway management and rehabilitation works. The partnerships’ aim will be to share lessons and learnings to achieve improved water quality and waterway health through restoring riparian and aquatic habitats, reducing erosion and sedimentation and improving connectivity. The projects will include a combination of planning, monitoring and “learning by doing” on-ground projects.

