



Queensland

STATE OF THE ENVIRONMENT 2020

Summary

Prepared by: Department of Environment and Science

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The Department of Environment and Science acknowledges Aboriginal peoples and Torres Strait Islander peoples as the Traditional Owners and custodians of the land. We recognise their connection to land, sea and community, and pay our respects to Elders past, present and emerging.

The department is committed to respecting, protecting and promoting human rights, and our obligations under the Human Rights Act 2019.

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August 2021

#31926

Front Cover Image: Hardy Reef, Great Barrier Reef, Queensland.

Foreword



Queensland is one of the most naturally diverse places on Earth. From our ancient rainforests, rugged outback interior, and majestic islands that dot a dramatic coastline—these unique and diverse landscapes are a cornerstone of our wonderful lifestyle.

Queensland's unique environment not only provides essential life services such as clean air and water, it underpins our general health, wellbeing and happiness. Our abundant natural resources also significantly contribute to the state's ongoing prosperity—supporting our agriculture, resources and tourism industries, while sustaining jobs for Queenslanders and providing economic opportunities for our regions.

Thoroughly understanding the state and condition of our environment, and the pressures and trends that impact on it, is essential if we are to effectively manage our environment, consider emerging risks and identify where future prosperity lies.

Queensland's State of the Environment Report (SoE)—which uses an internationally recognised method—is our tool for continually assessing the state's environmental performance. Using the best available science it presents detailed data across five themes—biodiversity, heritage, pollution, climate and liveability.

This evidence-based reporting, published every two years, is crucial for guiding our management responses and developing and prioritising appropriate policy and program actions. It also provides an important record of environmental trends spanning more than a decade.

The SoE is a collaborative effort, with input provided by government, industry, science, research and community partners. Their ongoing contributions to data collection and monitoring, modelling, analysis and presentation are greatly appreciated.

Through this system of best-practice, scientific evaluation and collective knowledge sharing, we can continue to take action to improve the health and resilience of our natural environment and deliver better outcomes for Queensland, now and for future generations.

Meaghan Scanlon MP
Minister for the Environment and the Great Barrier Reef
Minister for Science and Youth Affairs

Jamie Merrick
Director-General
Department of Environment and Science

Acknowledgment of Country

The Department of Environment and Science acknowledges the Country and people of Queensland's First Nations. We pay our respect to Elders, past, present and emerging.

We acknowledge the continuous living culture of First Nations Queenslanders—their diverse languages, customs and traditions, knowledges and systems.

We acknowledge the deep relationship, connection and responsibility to land, sea and sky Country as an integral element of First Nations identity and culture.

This Country is sacred. Everything on the land has meaning and all people are one with it. We acknowledge First Nations peoples' sacred connection as central to culture and being.

First Nations people speak to Country, listen to Country, sing up Country, dance up Country, understand Country and long for Country.

We acknowledge and thank First Nations people for the enduring relationship connecting people, Country and ancestors—an unbreakable bond that safely stewarded and protected the land, waters and sky for thousands of generations.



Red soil hand shape on sand in Aboriginal art style
© iStock.com/stanciuc

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Introduction

The Queensland State of the Environment 2020 report (SOE) provides an assessment of Queensland's environmental performance for the period January 2018–June 2020, using the internationally accepted 'pressure-state-response' framework.

It meets the legislative requirements of both the *Environmental Protection Act 1994* and the *Coastal Protection and Management Act 1995*.

The report provides information structured around five themes—biodiversity, heritage, pollution, climate and liveability.

These are divided into sub-themes which are reported on using indicators related to:

- extent and condition (state)
- pressures.

The 2020 report is the third report in a web-based format—www.stateoftheenvironment.des.qld.gov.au, the first being in 2015. Statutory requirements are for four yearly reporting; at present, Queensland updates the SoE on a biennial basis.

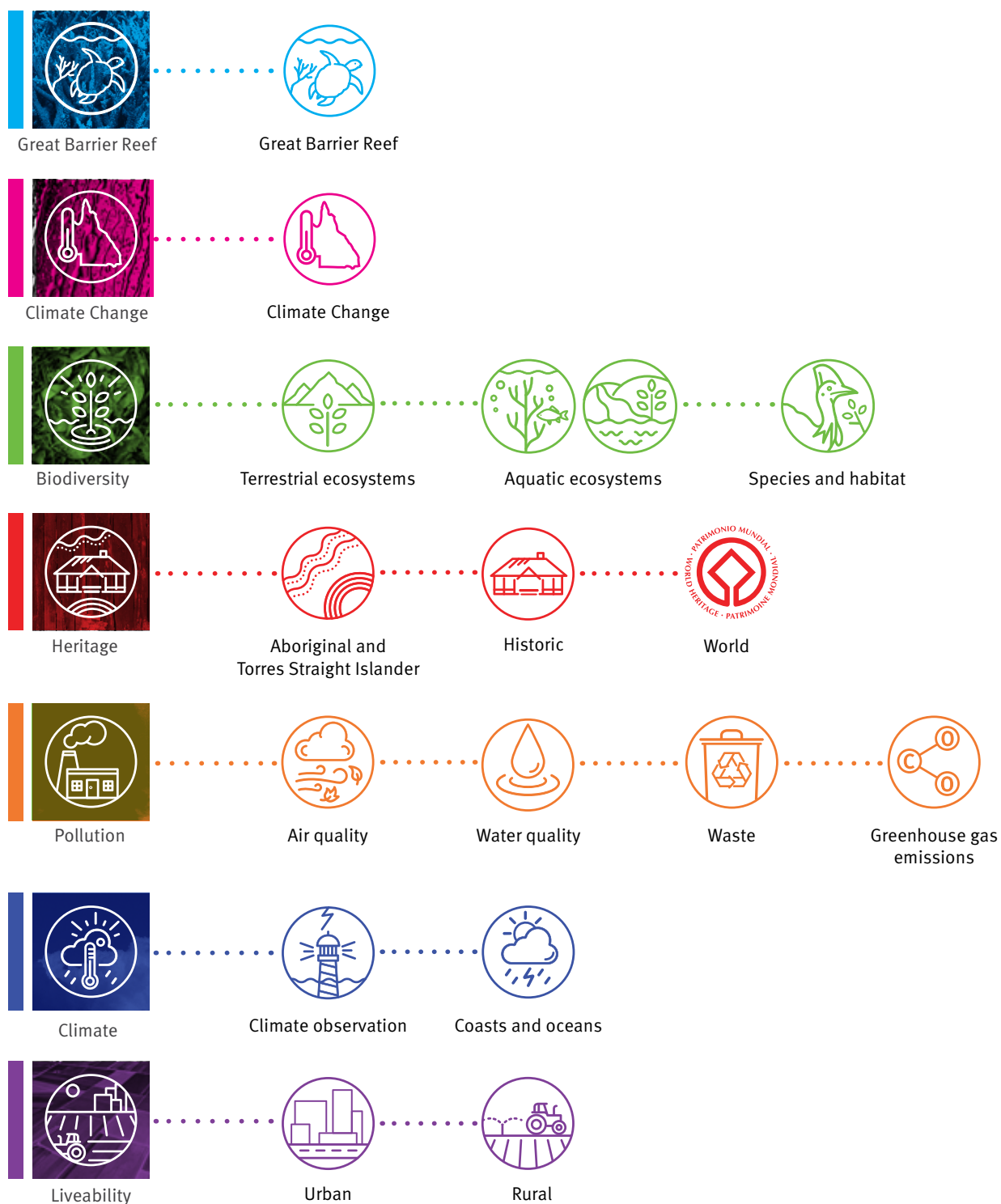
This Queensland State of the Environment 2020 Summary provides a high-level overview of some of the information included on the website.

It includes a brief introduction and key findings related to each of the themes and sub-themes in addition to separate sections on:

- The Great Barrier Reef—due to the reef's size and complexity and its values which cut across multiple themes
- Climate change, which amplifies many of the pressures on the environment.

The Summary document is not intended to replace or replicate the complete online report. Due to the aggregation of some content areas, the structure and information contained in this summary differs slightly to the online report.

Each theme and sub-theme is represented in the document using the icons below.





Lady Elliot Island, Southern Great Barrier Reef
© Queensland Museum Network/Gary Cranitch

1.0 Great Barrier Reef



Understanding the Great Barrier Reef

The Great Barrier Reef is one of the world's natural wonders and is the largest and most complex reef system, with a wide range of habitats and many thousands of different species recorded.

The Great Barrier Reef stretches more than 2,300 kilometres along Queensland's coastline and is made up of around 3,000 individual coral reefs that provide critical habitat to a breathtaking array of species. The Great Barrier Reef extends over 14 degrees of latitude, from shallow estuarine areas to deep oceanic waters. Within this vast expanse are a range of ecological communities, habitats and species—all of which make the Reef one of the most complex natural ecosystems in the world.

The Great Barrier Reef faces a number of escalating pressures and key ecosystems continue to be in poor condition.

Reef health (coral, seagrass and marine life) has been affected by poor water quality, outbreaks of coral-eating crown-of-thorn starfish and the cumulative impacts of climate change, including unprecedented back-to-back mass coral bleaching and increased severe weather events such as cyclones.

Climate change is the greatest threat to the Reef and is predicted to have far-reaching consequences for the Reef ecosystem over the next 50 years. As the climate changes, the Reef is likely to experience more frequent and severe coral bleaching events and major losses of coral and seagrass from severe tropical cyclones.

There have been multiple significant bleaching events in recent years, with the most significant occurring since 2016. By mid-2018, coral cover in the northern Great Barrier Reef was less than half of what it was in 2013 according to the Australian Institute of Marine Science's long-term monitoring. Bleaching occurs when corals are stressed, in this case from overheating.

Poor water quality resulting from land-based run-off is another key pressure, particularly for the inshore areas of the Great Barrier Reef. Excess nutrients, fine sediments and pesticides from agricultural run-off and other industries are a threat to Great Barrier Reef coastal and marine ecosystems. Excess nutrients may be linked to outbreaks of the coral eating crown-of-thorns starfish.

Science shows improving the quality of water flowing to the Great Barrier Reef is critical to building its resilience and enabling it to recover from the effects of a warming climate.

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

The Great Barrier Reef Outlook Report 2019 identified that initiatives to halt and reverse the effects of climate change at a global level and effectively improving water quality at a regional scale are the most urgent to improve the Reef's long-term outlook.

Key findings | Great Barrier Reef

WORLD HERITAGE

Inscribed on the **World Heritage List** in **1981**, it was the **first coral reef** ecosystem in the world to be **listed as world heritage**. It is now **one of 49** marine world heritage areas.



EXTENT

The Great Barrier Reef World Heritage Area covers **348,000 km²**

and includes both marine areas and all the Great Barrier Reef islands contained inside its boundary.



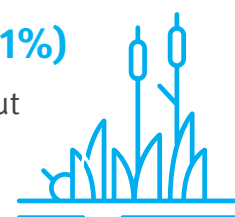
91% of pre-clear—estuarine wetland

0%

100%

remains within **North East Coast Great Barrier Reef drainage division**, but historical loss is unevenly distributed across catchments.

Loss of estuarine wetland during **2013–17** period was **41 ha (0.01%)** of the 2017 extent. Of this, **32 ha** was **salt marsh/salt flat wetlands** and about **10 ha** was **mangrove wetland**.



CONDITION

The outstanding universal value (OUV) of the Great Barrier Reef remains in good condition, but the **Outlook Report 2019** found the **grade** is **good borderline with poor** due to the condition of the property has deteriorated to varying extents.

This deterioration has affected the integrity of the Reef's OUV, for example:



Alterations to processes that influence reef formation has occurred



Ecological processes have deteriorated due to climate change and land-based run-off



Turtle breeding is being increasingly challenged by climate change



Significant habitat reduction and alteration has led to effects on populations



CONDITION

Marine condition has been **affected** by **land management practices** and **severe weather**, such as cyclones and floods, but **progress** has been made **towards** meeting **water quality targets**.



Climate change is **affecting** the **Great Barrier Reef** with **multiple mass coral bleaching events** since **summer 2016**.



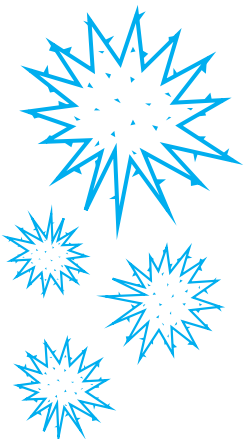
Inshore seagrass showed **signs of recovery** in some regions, but remained in **poor condition overall**.

PRESSURES

At a **reef-wide scale**, **climate related variables** are already having an effect, and are predicted to **continue to have far-reaching consequences for the Reef ecosystem**.



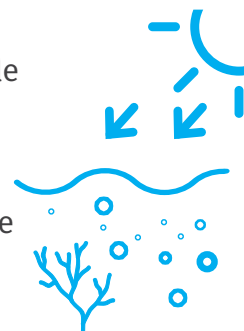
Evidence suggests **increased nutrient loads exacerbate outbreaks of crown-of-thorns starfish**—a major predator of coral—**resulting in coral cover decline**.



The **main source** of **excess nutrients, fine sediment and pesticides** is from **agriculture**.



Excess sediments reduce the light available to seagrass ecosystems and inshore coral reefs and can **smother** these **important marine habitats**.



1.1 Management responses

Management responses are the actions or initiatives undertaken to protect, maintain and restore environmental assets, as well as those that prevent, mitigate or adapt to changes in the environment. They are generally developed in reaction to the observed or anticipated pressures and impacts, or the state of the environment. They act in a multitude of ways, either individually or, more often, in concert with one another to bring about environmental change.

Applicable management responses related to the Great Barrier Reef included in the SOE 2020:

Legislation

- *Environmental Protection (Great Barrier Reef Protection Measures) and Other Legislation Amendment Act 2019*
- *Great Barrier Reef Marine Park Act 1975*
- *Marine Parks Act 2004*
- *Vegetation Management Act 1999*

Policy and programs

- Crown-of-thorns starfish response
- Great Barrier Reef Outlook Report
- Queensland Reef Water Quality Program
- Reef 2050 Long-Term Sustainability Plan
- Reef 2050 Water Quality Improvement Plan
- Reef Trust
- Reef Water Quality Report Card
- Regional report cards
- Scientific Consensus Statement

Headline initiatives: Great Barrier Reef

Applicable management responses led by the Department of Environment and Science related to the Great Barrier Reef since June 2020 include:

Reef Water Quality Improvement Plan

Protecting the Environment is a Queensland Government priority. The Reef 2050 Water Quality Improvement Plan sets a reduction target of 60% for dissolved inorganic nitrogen loads and 25% for sediment loads by 2025 to safeguard the Great Barrier Reef.

The Queensland Government has committed over \$700 million towards protecting the Great Barrier Reef since 2015. This includes \$270.1 million over five years to 2021–2022 and a new allocation of \$270.1 million over five years as part of the 2021–22 budget for the Queensland Reef Water Quality Program, and \$29.9 million under the Healthy Reef, Healthy Environment, Healthy Economy package. This package provides \$10 million to invest in Reef Credits, \$6 million for the Reef Islands Arks program, \$10 million for the Reef Assist Program, and funding for a tourism hub and visitor centre in the Daintree National Park.

Under the Queensland Reef Water Quality Program, the government is continuing to invest in projects focussed on improving Reef water quality. The majority of funding is allocated to on-ground water quality improvement projects by reducing pollutant run-off to local waterways.

In addition to the Reef Water Quality Report Card, there are five regional report card partnerships within the Reef catchment area—in the Wet Tropics, Dry Tropics, Mackay-Whitsunday-Isaac, Gladstone Harbour and Fitzroy Basin regions.

Other Queensland Government departments also continue to deliver valuable initiatives that help protect and conserve the Great Barrier Reef. These will be covered in the next SOE report.



Image courtesy of Commonwealth of Australia (GBRMPA)



Rockhampton floods
© The State of Queensland

2.0 Climate change



Understanding climate change in Queensland

Climate change refers to a long-term shift in global or regional climatic conditions, such as changes in temperature and rainfall patterns. Scientists have found that human influence on the climate system is clear and greenhouse emissions are the highest in history causing widespread impacts on human and natural systems.

Queensland's climate is changing. Hotter summers, warmer winters and more extreme disasters are some of the physical climate changes that are already occurring due to climate change.

Queensland has a highly variable climate and often experiences extremes such as tropical cyclones, floods, droughts, heatwaves, and bushfires. Climate change is likely to intensify these types of events. In addition, projected changes in temperature (especially longer and hotter heatwaves), rainfall patterns, sea level and extreme weather conditions will increasingly affect Queenslanders, the environment, particularly the health and condition of the natural environment, and the economy. For example, climate change is expected to further increase the frequency of coral bleaching events on the Great Barrier Reef.

The expected changes to Queensland's climate over coming decades may pose significant risks to our communities, industries and the environment. Queensland is adapting to this changing climate by preparing for current and future climate impacts in a way that reduces risk and increases resilience.

The Climate theme of this report provides more information about the physical changes to Queensland's climate. Alongside these physical changes, countries around the world are also undergoing a major economic transition as they decarbonise their economies and adopt low and zero emission alternatives.

To meet the goals of the Paris Agreement, Queensland has committed to reduce its carbon pollution and has set climate targets to reduce emissions by 30% below 2005 levels by 2030, and to commit to zero net emissions by 2050. In 2018, Queensland contributed more greenhouse gas emissions than any other Australian state and territory, responsible for 32% of Australia's total emissions. Decarbonisation of the economy presents opportunities for Queensland's industries and communities. Queensland is acting so that our communities, regions and industries remain strong in light of the global decarbonisation trend. The Pollution theme of this report provides more information about Queensland's greenhouse gas emissions and its trends across a number of sectors.

The transition to a low carbon, clean growth economy and adapting to a changing climate will help deliver better outcomes for Queensland communities and improve the health and condition of Queensland's natural environment including its unique biodiversity and ecosystems. As climate change is a pressure on all aspects of Queensland's environment, it is also addressed in other areas of this report.

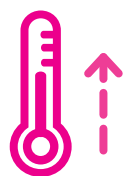
Key findings | Climate change

EMISSIONS

32% of Australia's **greenhouse gas emissions** are generated in **Queensland**.

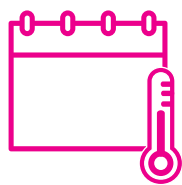


CLIMATE



About **1°C increase** in **average temperatures** across **Queensland** since **1910**.

3.4mm average rise in **sea level per year** since **1996** (similar to the global mean trend).



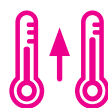
2015–19 was the **warmest 5-year period** on record.

Climate change is affecting the **Great Barrier Reef** with **multiple mass coral bleaching events** since **summer 2016**.



FUTURE CLIMATE*

Global climate models project various future changes to Queensland's climate, including:



1.2°C–3.9°C increase in temperature by 2070



0.8 metre sea level rise by 2100



Hotter and more frequent hot days



Warmer and more acidic oceans



Harsher fire weather



More time in drought for some areas of Queensland



More intense heavy rainfall events



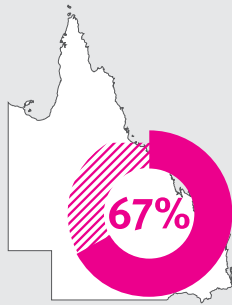
Fewer frosts

*As this information relates to future climate projections, there is no corresponding data contained in the State of the Environment 2020 report.



DROUGHT DECLARATIONS

Queensland has been in **drought** for its **9th** successive year (April 2013–April 2020), with **67%** of the **state drought declared**.



FIRE WEATHER AND ASSOCIATED BUSHFIRE HAZARD

From 1950–2018 Queensland saw **increased severity** in the **fire-weather** season **due to climate change**.



HEATWAVE EVENTS



Between **1986 to 2015**, about **80%** of Queensland has experienced an **average** of **3 heatwave events per year**.

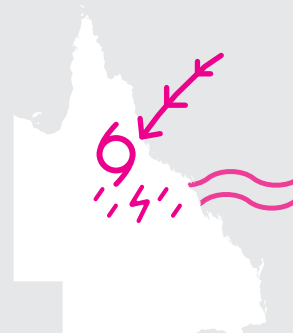
EARTHQUAKE HAZARD

The state's **south-east** is the **most at risk of experiencing an earthquake**.



SEVERE WEATHER EVENTS AND ASSOCIATED FLOODING HAZARD

Queensland has been directly impacted by **8 severe tropical cyclones** and more than **20 cyclones of other intensities** since 2010. Observations suggest there has been a **rise in extreme severe weather** events **due to climate change**.



2.1 Management responses

Management responses are the actions or initiatives undertaken to protect, maintain and restore environmental assets, as well as those that prevent, mitigate or adapt to changes in the environment. They are generally developed in reaction to the observed or anticipated pressures and impacts, or the state of the environment. They act in a multitude of ways, either individually or, more often, in concert with one another to bring about environmental change.

Applicable management responses related to climate change included in the SOE 2020:

Legislation

- *Vegetation Management Act 1999*

Policy and programs

- Building community capacity and resilience
- Carbon farming in Queensland
- Climate Solutions Fund - Emissions Reduction Fund
- Disaster Recovery Funding Arrangements (DRFA)
- Emissions reduction targets
- Encouraging innovation and low carbon technologies
- Government leading by example
- Low carbon energy and industries
- Managing Climate Risk: Actions for Queensland Government
- Queensland State Disaster Management Plan
- Queensland Treasury Corporation Green Bonds
- Reducing emissions from the built environment and infrastructure
- Sector Adaptation Plans
- Skilling Queenslanders for new economy jobs
- State Earthquake Risk Assessment (and the Tsunami Guide for Queensland)
- State Heatwave Risk Assessment
- State Natural Hazard Risk Assessment 2017
- Supporting local governments and regions to adapt
- Supporting Queensland communities to take action
- The Future is Electric: Queensland's Electric Vehicle Strategy

Headline initiatives: Climate change

Applicable management responses led by the Department of Environment and Science related to Climate Change since June 2020 include:

Queensland Climate Action

The Queensland Government is delivering significant investment in climate actions including a \$1.5 billion boost to the \$500 million Renewable Energy Fund and \$35 million for a Natural Capital Fund to facilitate private sector co-investment to achieve environmental outcomes.

Land Restoration Fund

As of January 2020, the Queensland Government has delivered its commitment to establish a \$500 million Land Restoration Fund to develop Queensland's emerging carbon farming industry.

The Land Restoration Fund values the additional benefits (co-benefits) that carbon farming delivers beyond the carbon benefits. Co-benefits are the direct, positive environmental, social, economic and First Nations outcomes associated with carbon farming projects.

The Land Restoration Fund has contracted 18 projects through its first investment round with a total value of \$91.77 million. The contracts will purchase around 1.9 million carbon credits with co-benefits across the life of the project (typically around 15 years). These projects cover almost 1.8 million hectares of land (project size) and are geographically diverse.

A second round of investment in the Land Restoration Fund of \$25 million has been approved by the Queensland Government. The Investment Round will prioritise carbon farming projects that provide outcomes for the Great Barrier Reef, as well as carbon farming projects that restore native vegetation as part of holistic regenerative agriculture practices.

Other Queensland Government departments also continue to deliver valuable initiatives that help address the gaps and opportunities from climate change. These will be covered in the next SOE report.





3.0 Biodiversity

The variety of life—its biological diversity—is commonly referred to as biodiversity.

Queensland is widely considered a biodiversity ‘hotspot’. Our state’s vast landscape covers an estimated area of 172.8 million hectares, has a mainland coastline of about 6,900km and 1,165 offshore islands and cays.

This vast area contains a huge number of plant and animal species as well as different ecosystems such as deserts, rainforests and coral reefs—all of which are part of a biologically diverse Queensland.

An ecosystem is a collection of communities of both living and non-living things that are interrelated. The biotic—or living—things found in an ecosystem include various life forms such as plants and animals. The abiotic—or non-living—things found in an ecosystem include the various land-forms and the climate.

The biodiversity theme comprises Terrestrial ecosystems, Aquatic ecosystems (including freshwater wetland and estuarine and marine ecosystems) and Species and habitat.



Red sand dunes, Welford National Park
© iStock.com/Janelle Lugge



Dry sclerophyll forest, Bellthorpe
© The State of Queensland

3.1 Terrestrial ecosystems

Terrestrial ecosystems are entirely land-based. They comprise communities of organisms and their environments that occur on the land masses of continents and islands, and they provide important habitat for many animals and plants. They include regional ecosystems which are discrete vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The biodiversity status of regional ecosystems is classified as: 'Endangered', 'Of concern', and 'No concern at present'.

Broad vegetation groups are a higher-level grouping of vegetation communities across the state, encompassing a wide variety of landscapes across temperate, wet and dry tropics and semi-arid to arid climatic zones.

Why terrestrial ecosystems are important

Terrestrial ecosystems are the community of living organisms and the non-living environmental features that support them. They are essential for the provision of services (e.g. food, fuel) and ecological processes for all life on Earth. The challenges of improving ecosystems include options to conserve or enhance them and the services they provide in ways that boost co-benefits and reduce negative trade-offs.

Condition

Currently there is a lack of information about the condition of terrestrial ecosystems. However, the Queensland Herbarium is developing BioCondition—a vegetation condition assessment framework used to measure how well a terrestrial ecosystem is functioning for the maintenance of biodiversity values. It is a site-based, quantitative and repeatable assessment procedure. Benchmark descriptions for each of the state's currently recognised 1,459 regional ecosystems are being compiled for the tool, with 480 available. A program of work by the Queensland Herbarium and Remote Sensing Centre is currently in progress to develop a method to map vegetation condition at a regional level.

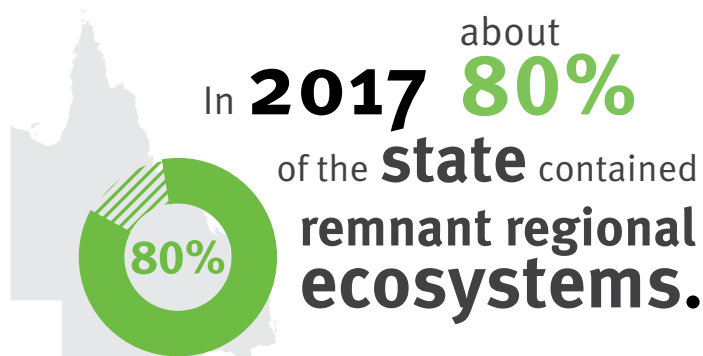
Pressures

- Invasive non-native fauna species place significant pressure on Queensland's native biodiversity through predation, competition for food and shelter, destruction of habitat, altering ecosystem balance and poisoning. Invasive non-native flora species degrade natural vegetation and impact on biodiversity.
- Land clearing, predominantly for pasture, and fragmentation are significant pressures on terrestrial ecosystems. Fragmentation—the 'breaking up' of large areas of intact native vegetation for the purposes of clearing for development—reduces the ecological connectivity between habitats which allows for wildlife to cross the landscape for food, breeding and, ultimately, survival.
- Climate change is also expected to have both direct and indirect impacts on biodiversity in Queensland.



Key findings | Terrestrial ecosystems

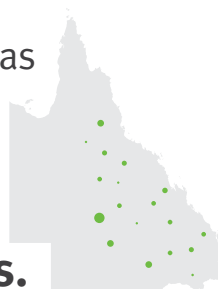
REGIONAL ECOSYSTEMS



Surveying and **mapping** of regional ecosystems has been **completed for 100%** of Queensland showing the extent of **native vegetation remaining** from pre-settlement clearing and 2017 remnant.

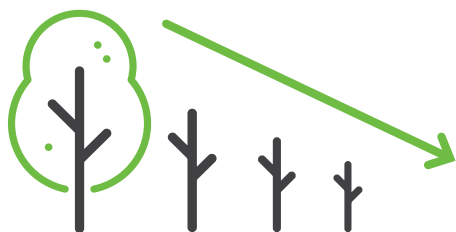


Queensland has **1,459** regional ecosystems.



EXTENT AND RATE OF CHANGE

Remnant vegetation clearing increased by 168% between 2011–13 and 2015–17, mainly due to clearing land for pasture.



As at **2017**, one **Broad Vegetation Group** (mainly comprising other acacia dominated open forests, woodlands and shrublands) had **less than 60%** remnant **native vegetation.**

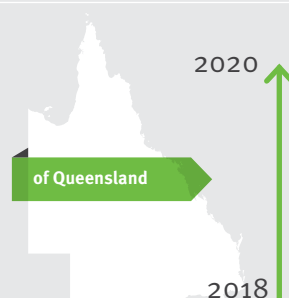
PROTECTION

Remnant vegetation

covers **80%** of the **state** with **10.1%** of this **remnant vegetation** in **protected areas.**



The **protected area estate** (including national parks and nature refuges) **covers 8.24%** —an **increase** of more than **40,971 hectares** between 1 January 2018 and 30 June 2020.





LAND CLEARING

In 2017–18, 392,000 ha per year of woody vegetation was **cleared**, an **increase** of **→ 10 %** from **2016–17**.



In 2017–18,

19%

of clearing was of remnant woody vegetation and



81%

was of non-remnant woody vegetation.



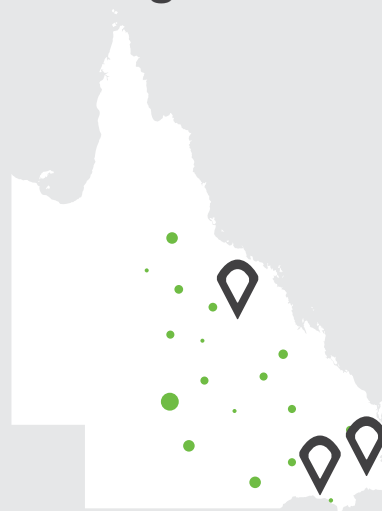
RIPARIAN VEGETATION

Between **2013** and **2017**, woody vegetation has **decreased** in extent within the **riparian zones** of **SEQ and the GBR catchments**. Most of the decrease is **due to land clearing**.



FRAGMENTATION

The **southern bioregions** are the most **heavily fragmented** in Queensland. The **New England Tableland, Mulga Lands** and the **Brigalow Belt** have a **high level of fragmentation**.



INVASIVE NON-NATIVE SPECIES

Invasive non-native fauna and flora species place **significant pressure** on **Queensland's native biodiversity**.





Melaleuca Wetlands, Slade Point Natural Resource Reserve, Mackay
© Qld.Museum Network/Gary Cranitch

3.2 Aquatic ecosystems

Aquatic ecosystems comprise freshwater wetland, estuarine and marine ecosystems.

Freshwater wetland ecosystems include lakes, rivers, streams, springs, marshes and swamps. They have many functions, from reducing floods to producing clean water and food for humans, industry and agriculture; they also provide important habitat for many animals and plants.

Estuarine wetlands are those with marine or oceanic water which is diluted with freshwater run-off from the land. They are usually in an area where a river meets the sea, providing an important habitat for many species.

Marine wetlands include the area of ocean from the coastline to 6m below the lowest astronomical tide. They provide important habitat for many animals and plants. Some, such as the Great Barrier Reef, are world-renowned marine wetland areas, attracting visitors from all over the world.

Why aquatic ecosystems are important

Queensland's freshwater wetland, estuarine and marine ecosystems are important habitats, supporting much of the state's native biodiversity including migratory birds, frogs, fish, dugongs, dolphins, turtles and other threatened species.

They are important for the economy because they provide nurseries for fish and water for farming. Wetlands help protect people and property from storms and floods; they also protect other downstream habitats by removing sediments and transforming nutrients and pesticides.

Condition

Queensland's aquatic ecosystems vary significantly in condition. Some are in good to very good condition while others do not meet standards for water quality. Depending on location, water quality report cards document the state of water quality, habitat condition and other ecosystem features at various spatial and time scales. Regional report card partnerships produce annual water quality report cards for a number of Great Barrier Reef catchments, including Gladstone Harbour, Fitzroy Basin, Mackay-Whitsunday-Isaac, Townsville Dry Tropics and the Wet Tropics. The Healthy Land and Water Report Card details South East Queensland's aquatic conditions. The Queensland Government QCatchments program conducts water quality assessments for many freshwater systems in Queensland, including the Queensland Eastern Murray Darling.

These report cards provide in-depth information on aquatic ecosystem health.



3.2 Aquatic ecosystems

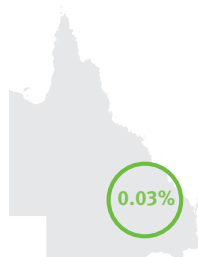
Pressures

- Invasive non-native fauna species, particularly pest fish, are relatively widespread in some sections of Queensland's freshwater ecosystems and have the potential to degrade and modify aquatic environments as well as displace native species.
- Invasive non-native flora species can have significant impacts on freshwater ecosystems including smothering native vegetation, blocking creeks, reducing water quality by preventing light penetration, reducing oxygenation of water, and choking out fish and other aquatic wildlife.
- Queensland has two species of invasive non-native marine flora and fauna species (marine pests) established with a high possibility of further introductions through international shipping activity and other pathways. White colonial sea squirt and Black scar oysters have recently been detected in Queensland and are considered established in number of locations. Asian green mussels have been detected on a number of occasions including a small number of environmental detections however rapid response to the detections, including surveillance activities, indicate no known establishment.
- Sediment, nutrients, chemicals, litter, loss of riparian forests, filling, hydrological modifications, extraction and draining are the major catchment pressures that broadly impact Queensland's freshwater wetland, estuarine and marine ecosystems. These vary in their relative importance between regions.
- Climate change is the most significant threat to the Great Barrier Reef's long-term outlook.

Key findings | Aquatic ecosystems

EXTENT AND RATE OF CHANGE

In **2017**, more than **94%** of the pre-European settlement extent of **freshwater wetlands**, and more than **96%** of the pre-European settlement extent of **estuarine wetlands**, remained in Queensland.



Since 2001, the **highest rate** of **estuarine wetland loss** was **0.03%**—occurring in the **North East Coast drainage division** during **2001–05**.

Freshwater wetland loss during **2013–2017** **increased** to **0.13%** due to **agricultural expansion** and **infrastructure development**.



The greatest ongoing losses occurred in palustrine and riverine systems in the Gulf and North East Coast (Great Barrier Reef) Drainage divisions.

CONDITION

The **majority** of **Queensland's key fish stocks** are considered **sustainable**.



943,000 Queenslanders were involved in recreational fishing in **2019**, an **increase of more than 300,000** since 2013.

PROTECTION

38% of **estuarine wetlands across Queensland** are within an area of **managed protection** (which often overlap). This includes:

29% in declared fish habitat areas
11% in highly protected marine park zones
5% in protected areas.



10% of **freshwater wetlands** in **Queensland** are within **protected areas**.

The majority are palustrine systems and within national parks.



1.9 million hectares of **marine wetlands** in Queensland waters are in **highly protected marine park zones** or a **declared fish habitat area**, representing about **18%** of the state's **total marine wetlands**.





Green Tree Frog (*Litoria caerulea*)
© Qld.Museum Network/Gary Cranitch

3.3 Species and habitat

Queensland has some of the most naturally diverse species and habitats in Australia, both native flora (plants) and fauna (animals). Every species requires a certain set of environmental conditions to be able to survive, move around, feed and reproduce. Whether in the forest, grassland, desert or ocean, the place where each species finds the conditions needed to live and thrive is called its habitat. When habitats are threatened, so are the animals and plants that live there.

Queensland has about 85% of Australia's native mammals, 72% of its native birds, more than half of the nation's native reptile and frog species and more than 14,000 native plant species.

Why species and habitat are important

Queensland's native flora and fauna are unique and valuable elements of our state's rich biodiversity. Conserving our native biodiversity not only ensures its protection for future generations but helps maintain healthy ecosystems, clean water and clean air.

Some species of flora and fauna are at risk of extinction due to threatening processes including the clearing of habitat. These 'threatened' flora and fauna are declared under Queensland's *Nature Conservation Act 1992*.

Understanding the distribution of threatened species habitat prior to land clearing allows examination of trends in habitat loss, determination of the adequacy of the current reserve system for protecting threatened species habitat and the prioritisation of new areas for protection or restoration.

Monitoring the changes in threatened species numbers provides an overview of whether species, over time, are still experiencing pressures that put them at risk of extinction.

Condition

Currently there is a lack of information about habitat condition.

However, the Queensland Herbarium is developing BioCondition, a vegetation condition assessment framework used to measure of how well a terrestrial ecosystem is functioning for the maintenance of biodiversity values at a local or property scale. The framework can be used for assessing vegetation condition (and, by extension, the habitats it supports) at a site and extrapolated to an area. A program of work by the Queensland Herbarium and Remote Sensing Centre is currently in progress to develop a method to map vegetation condition at a regional level.

The Queensland Government also supports a number of regional waterway health report cards to provide in-depth information on aquatic ecosystem health which will help inform habitat condition.

Pressures

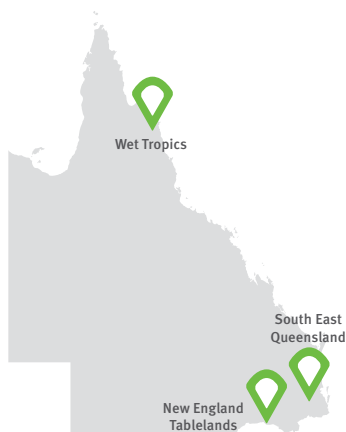
- A range of pressures put species at threat of extinction within Queensland. Major threats have been identified under the Back on Track species prioritisation framework, most significantly:
 - inappropriate fire regimes
 - inappropriate grazing regimes
 - clearing of vegetation, including for urban expansion
 - introduced predators
 - weeds.
- Land clearing for pasture (which includes clearing for grazing, thinning, fodder, rural residential and future urban land use) is the greatest pressure on threatened fauna and flora pre-clearing habitat. Clearing remains three times higher than in 2009–2010, when clearing rates were at their lowest since annual reporting began in 1999–2000.
- Although a large proportion of pre-clear threatened flora and fauna habitat remains in Queensland, threatened fauna habitat loss has slowed by 11% relative to the 2015–2016 reporting period.
- The impact associated with climate change has also been identified as a major factor in the risk of extinction of fauna and flora species in Queensland.



Key findings | Species and habitat

THREATENED SPECIES HABITAT

The **highest densities** of **terrestrial threatened fauna and flora species habitat** are found in the **South East Queensland, Wet Tropics and New England Tablelands** bioregions.



Climate change also is expected to have **both direct and indirect impacts** on Queensland **fauna** and **flora species**.

MAJOR THREATS

34 major threats have been identified that impact on **Queensland threatened flora**. The threats affecting the most species are:



Clearing of vegetation



Inappropriate fire regimes



Weeds

Queensland's threatened fauna are at risk from

68 major threats most commonly



Clearing of vegetation



Inappropriate fire regimes



Inappropriate grazing regimes



Introduced predators

THREATENED SPECIES NUMBERS

An additional

83 fauna species were listed as **vulnerable, endangered or presumed extinct** in Queensland between **2007** and **2019**.

1 species has been listed as **presumed extinct** since 2017.

An additional

277 flora species were listed as **threatened** in Queensland between **2007** and **2019**.

There has been **no change** in the total **number of flora species listed as presumed extinct** since 2017.



Wallaman Falls Rainforest vegetation, Girringun National Park
© The State of Queensland

3.4 Management responses

Management responses are the actions or initiatives undertaken to protect, maintain and restore environmental assets, as well as those that prevent, mitigate or adapt to changes in the environment. They are generally developed in reaction to the observed or anticipated pressures and impacts, or the state of the environment. They act in a multitude of ways, either individually or, more often, in concert with one another to bring about environmental change.

Applicable management responses related to biodiversity included in the SOE 2020:

Legislation

- *Biosecurity Act 2014*
- *Environmental Offsets Act 2014*
- *Fisheries Act 1994 (Fish Habitat Areas)*
- *Great Barrier Reef Marine Park Act 1975*
- *Marine Parks Act 2004*
- *Nature Conservation Act 1992*
- *Nature Conservation and Other Legislation (Koala Protection) Amendment Regulation 2020*
- *The Convention on Wetlands (Ramsar Convention)*
- *Vegetation Management Act 1999*

Policy and programs

- BioCondition
- Carbon farming in Queensland
- Conservation and management of crocodiles
- Enhanced Fire Management Program
- Great Barrier Reef Outlook Report
- Healthy Waters Management Plans/Water Quality Improvement Plans
- Indigenous Land and Sea Rangers
- Invasive pest species management and eradication
- Koala Habitat Mapping (SEQ)
- Koala Strategy
- Landscape Fragmentation Connectivity tool
- MyRanger Mobile App
- National Landcare Program
- Natural Resource Investment Program —2018 to 2022
- Nest to Ocean Program
- Northern Hairy-Nosed Wombat Program

- Point Source Water Quality Offsets Policy
- Private Protected Area Program and NatureAssist
- Protected area management arrangements
- Protected area acquisition
- Protected areas
- Queensland Biosecurity Strategy and Queensland Invasive Plants and Animals Strategy 2019–2023
- Queensland Protected Area Strategy
- Reef 2050 Long-Term Sustainability Plan
- Reef Water Quality Report Card
- Regional report cards
- Selection and prioritisation of new protected areas
- South East Queensland ‘Investing in Our Environment for the Future’ Program
- Statewide Landcover and Trees Study (SLATS)
- Status of key fish stocks
- Strategic Fire Management Program
- Strategic Pest Management Program
- Sustainable Fisheries Strategy
- Values-Based Management Framework (VBMF)
- Walking the landscape
- WetlandInfo
- Wetlands in the Great Barrier Reef Catchments Management Strategy 2016–2021

Headline initiatives: Biodiversity

Applicable management responses led by the Department of Environment and Science related to biodiversity since June 2020 include:

Protected Areas Strategy

Queensland's protected area system includes a mix of state-owned and managed protected areas, First Nation Peoples-owned national parks jointly managed by Traditional Owners and Queensland Parks and Wildlife Service and Partnerships and privately owned and managed nature refuges including those owned and managed by First Nation peoples. Recent research estimates that national park-generated spending in 2018 alone made a \$2 billion-plus contribution to Queensland's Gross State Product and supported 17,241 jobs directly and indirectly.

In 2020, the Queensland Government released the Queensland's Protected Area Strategy 2020–2030, a ten-year plan for supporting the growth, management and sustainability of national parks and other protected areas. The Protected Area Strategy includes an initial investment of \$60 million which will deliver the following priority activities:

- \$28 million for the strategic acquisition of properties across the state for dedication as protected areas.
- \$8 million to expand the Private Protected Areas Program that supports landholders to establish Nature Refuges and Special Wildlife Reserves on their land.
- \$24 million to fund a further 100 Indigenous Land and Sea Rangers.

In late 2020, a further \$6 million was committed to the Great Barrier Reef Island Arks project to acquire and protect some of the Reef's most valuable areas.

The Protected Area Strategy outlines a vision whereby Queensland's protected areas are "world-class for people, culture and nature". The implementation of the Protected Area Strategy has already resulted in the addition of over 28,600 hectares to the public protected area estate in 2020–2021, the dedication of Pullen Pullen Reserve as the first Special Wildlife Reserve, and the commencement of the expansion of the Indigenous Land and Sea Ranger program.

Koala Strategy

The *South East Queensland Koala Conservation Strategy 2020–2025* (Koala Strategy) establishes a vision, targets and coordinated actions for koala conservation, and maps a network of priority areas to focus koala habitat protections and conservation efforts. Through the Koala Strategy, the Queensland Government is committed to maintaining viable and healthy koala populations in South East Queensland, and in doing so, safeguard the future of this iconic species.

The Koala Strategy is built around six key action areas including habitat protection. New koala conservation protections within the state's planning framework are delivering the strongest koala habitat protections Queensland has seen—by prohibiting (unless exempt) clearing in 330,660 hectares of koala priority areas and regulating development in a further 385,606 hectares of koala habitat across South East Queensland.

The Koala Strategy also commits to improved mapping, monitoring, research and reporting, which will ensure that progress toward Strategy targets and action areas are evaluated and transparently reported over the Koala Strategy's lifetime.

Other Queensland Government departments also continue to deliver valuable initiatives that help protect and conserve Biodiversity. These will be covered in the next SOE report.



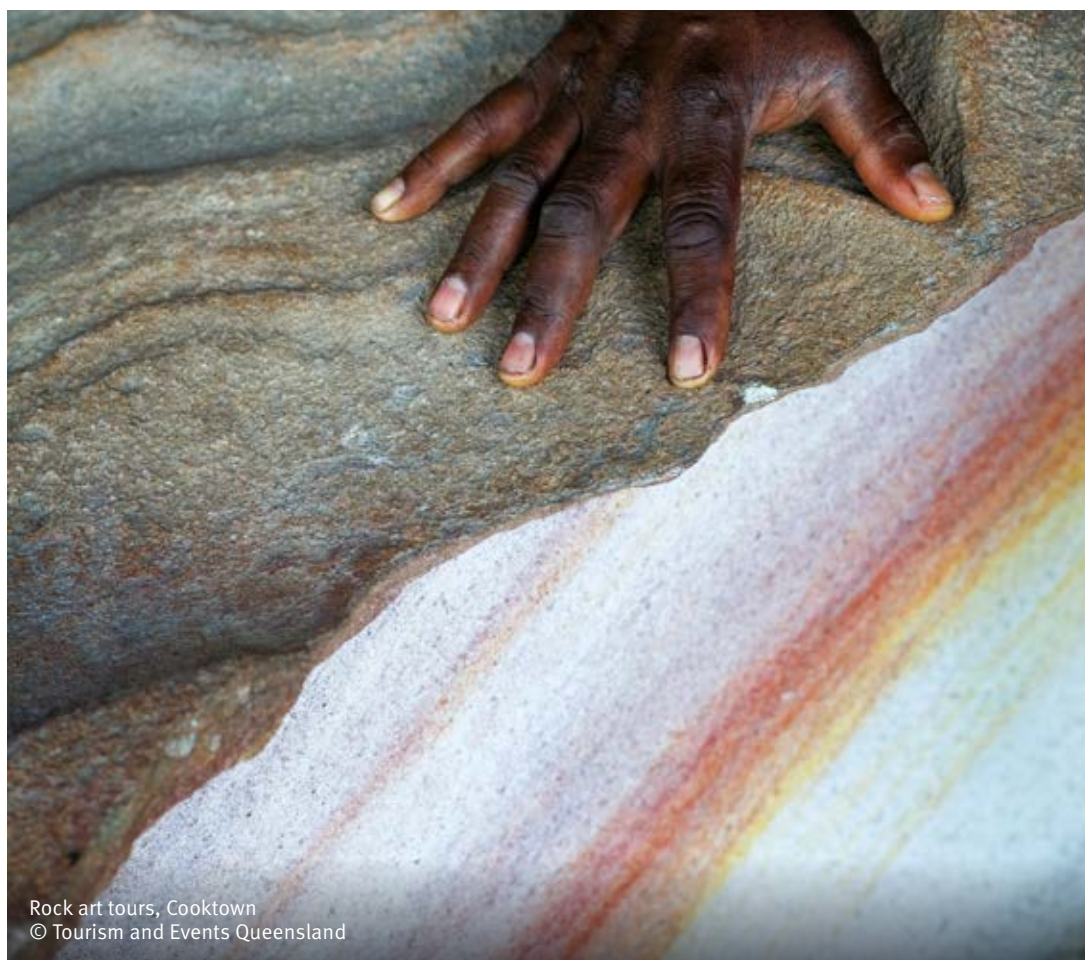
Lawn Hill Gorge, Boodjamulla (Lawn Hill) National Park
© The State of Queensland

4.0 Heritage

Queensland has a rich and diverse heritage. Heritage places, areas and objects contribute to our sense of place, reinforce our identity and help define Queensland's story. They form part of our common inheritance and we have a responsibility to ensure their conservation for present and future generations.

Queensland's most important historic heritage places are entered in the Queensland Heritage Register which aims to be a comprehensive and representative record of Queensland's past. Places that are important at a local level, but which do not necessarily meet the state heritage threshold, are required to be recognised on a local government heritage register or be identified in the local planning scheme. Natural, historic and Indigenous places of outstanding significance to Australia are entered in the National Heritage List.

The heritage theme is separated into the following sub-themes: Aboriginal and Torres Strait Islander; Historic; and World.



Rock art tours, Cooktown
© Tourism and Events Queensland





Carnarvon Gorge, Carnarvon National Park
© The State of Queensland

4.1 Aboriginal and Torres Strait Islander

Aboriginal and Torres Strait Islander people have distinct identities, histories and cultural traditions. Their cultural heritage includes areas, objects, and evidence of archaeological or historic significance of Aboriginal or Torres Strait Islander occupation of an area of Queensland. Areas and objects of traditional, customary, and archaeological significance are protected in Queensland.

Why Aboriginal cultural heritage and Torres Strait Islander cultural heritage is important

Australia is home to the oldest continuous culture on Earth with 65,000 years of uninterrupted heritage. Queensland is even more unique because it is home to two distinct cultural groups with their own diversities. The Aboriginal peoples and the Torres Strait Islander peoples share a symbiotic relationship with the land, waters and sky country and everything in it.

There are many different types of Aboriginal and Torres Strait Islander sites and places throughout Queensland and numerous ways of describing them.

In Queensland, the protection of Aboriginal cultural heritage and Torres Strait Islander cultural heritage is a legislative obligation and all land users have a responsibility to take all reasonable and practicable measures to avoid causing harm.

Pressures

There is increasing pressure on Aboriginal cultural heritage and Torres Strait Islander cultural heritage from major development projects, particularly in the resources, energy generation, public infrastructure and residential development sectors.



Key findings | Aboriginal and Torres Strait Islander

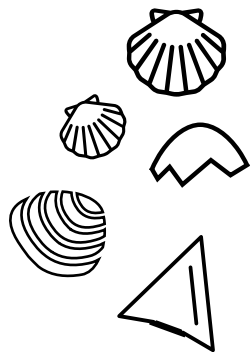
CULTURAL HERITAGE

9,163 new site locations

were recorded on the

**cultural
heritage
database
since July 2015**

(As at March 2020, there were 52,806 site locations on the register.)



Between
July 2015 – March 2020

71

**cultural
heritage
management
plans**

were approved and registered.



PRESSURES



The number of **cultural heritage management plans approved** is consistent with **continued development activities** within the **mining, resources and energy generation sector** and **public infrastructure**. This suggests constant ongoing **pressure** on **Aboriginal and Torres Strait Islander cultural heritage** from major projects.



Stone arrangement, Outback Queensland
© Tourism Queensland



Cottage in lush paddock, Queensland
© iStock.com/Michele Jackson

4.2 Historic

Queensland's heritage comprises places from our past that we want to keep, respect and pass on to future generations. These places reflect our history and evoke special meaning for us as individuals, and as members of communities.

Heritage places help tell us who we are and how we connect with the things that have formed our community and environment. These places are tangible expressions of the way people interact with their wider natural, social and economic environments. Some places are important to the nation, some are important to the state, while others have importance to regional and local communities.

The Queensland Heritage Register is a comprehensive record of the state's most significant historic heritage places, and includes buildings and structures, cemeteries, archaeological sites, gardens and landscapes. The majority of local heritage places and areas are identified and protected through local government planning schemes.

Why historic heritage is important

Heritage places are central to our community's character and identity—allowing us to trace our history and feel connected to the important stories about our progress.

Protecting, conserving and promoting heritage places and their stories plays an important role in creating community identity, sustaining local economies and contributing to Queensland's cultural heritage tourism industry.

Queensland's shipwrecks reflect the diverse stories of adventure, industry, disaster and ingenuity that stem from the state's maritime heritage. Many shipwrecks continue to serve the economy as recreational diving locations.

Pressures

Heritage places continue to be at risk from destructive events, such as fire and flooding.

Extreme events—including cyclones, floods, severe storms and fire—have seen substantial impacts and damage occurring to several Queensland Heritage Places.



Key findings | Historic

HISTORIC HERITAGE

Since 2018, **one Queensland place** has been added to the **National Heritage List**.



Since 2018, the following **changes** were made to the **Queensland Heritage Register**:



48 places were **entered**.



3 State Heritage places were **destroyed**.

Since 2018, the **Australasian Underwater Cultural Heritage Database** was **updated** to include:

14

existing shipwreck entries



4

new shipwreck entries



3

aircraft entries



2

artefact entries



Of the **78** local governments in Queensland, **63** identify local heritage places in their planning schemes (as of May 2020).



OPEN HOUSE EVENTS

BNE OPEN HOUSE

Queensland's Open House events encourage the community to explore a region's significant buildings and history.

In 2019, the event attracted

96,000 visitors.

79,448 Brisbane Open House

8,054 Maryborough Open House

4,000 Gold Coast Open House

4,002 Sunshine Coast Open House

1,428 Bundaberg Open House.



Interior of Old Government House Cellar
© Jeff Cheadle





Elabana Falls, Lamington National Park
© iStock.com/Greg Sullavan

4.3 World

World Heritage areas are considered the most outstanding natural or cultural heritage places. They are selected by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). Queensland, one of the most naturally diverse places on Earth, has five world heritage areas: the Great Barrier Reef; Wet Tropics of Queensland; Riversleigh section of the Australian Fossil Mammal Sites; Fraser Island (K'gari); and Gondwana Rainforests of Australia.

Why World Heritage is important

World Heritage areas are places that have universal value that transcends the value they hold for a particular nation. These qualities are expressed in the Convention concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention). The World Heritage Convention aims to promote cooperation among nations to protect heritage from around the world that is of such outstanding universal value that its conservation is important for current and future generations.

Pressures

Pressures on Queensland's World Heritage areas include:

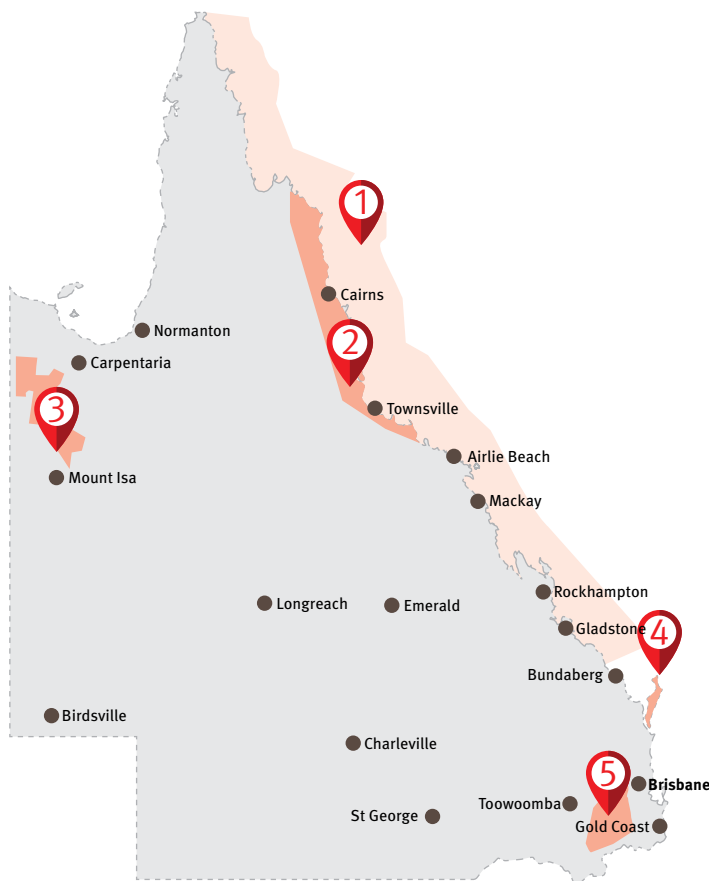
- The Great Barrier Reef—climate change, coastal development, land-based run-off, direct use, and crown-of-thorns starfish.
- Wet Tropics of Queensland—climate change, and invasive species and pathogens.
- Riversleigh section of the Australian Fossil Mammal Sites—illegal removal of fossils, research activities, and altered fire regimes.
- Fraser Island (K'gari)—invasive species and pathogens, tourism, climate change, and altered fire regimes.
- Gondwana Rainforests of Australia—climate change, invasive species and pathogens, tourism, altered fire regimes, and fragmentation.



Key findings | World

QUEENSLAND'S WORLD HERITAGE AREAS

1. Great Barrier Reef | 2. Wet Tropics of Qld | 3. Riversleigh | 4. Fraser Island (K'gari) | 5. Gondwana Rainforests



1. Inscribed on the World Heritage List: 1981.

The Great Barrier Reef became the first coral reef ecosystem to be listed on the World Heritage List in recognition of its outstanding universal value and importance to the global community.

2. Inscribed on the World Heritage List: 1988.

The Wet Tropics of Queensland, although small in area, conserves an extraordinary percentage of Australia's biodiversity and is the only habitat for many endemic and threatened species.

3. Inscribed on the World Heritage List: 1994.

The Riversleigh section of the Australian Fossil Mammal Sites is one of the most significant fossil deposits in the world, and has the richest known mammal deposit in Australia.

4. Inscribed on the World Heritage List: 1992.

Fraser Island, also known by its Aboriginal name of K'gari, is the world's largest sand island. It is an outstanding example of ongoing biological, hydrological and geomorphological processes and features the world's largest unconfined aquifer on a sand island.

5. Inscribed on the World Heritage List: 1986.

The Gondwana Rainforests of Australia feature outstanding examples of major stages of Earth's evolutionary history as well as ongoing geological and biological processes and exceptional biological diversity.



Lake McKenzie, K'gari (Fraser Island)
Photo: Danielle Bolton



4.4 Management responses

Management responses are the actions or initiatives undertaken to protect, maintain and restore environmental assets, as well as those that prevent, mitigate or adapt to changes in the environment. They are generally developed in reaction to the observed or anticipated pressures and impacts, or the state of the environment. They act in a multitude of ways, either individually or, more often, in concert with one another to bring about environmental change.

Applicable management responses related to heritage included in the SOE 2020:

Legislation

- Aboriginal and Torres Strait Islander cultural heritage database and cultural heritage register
- Aboriginal and Torres Strait Islander cultural heritage legislation
- Cultural Heritage Management Plans
- Management Planning
- *Queensland Heritage Act 1992*
- Queensland Heritage Register
- *Underwater Cultural Heritage Act 2018*
- World Heritage List

Policy and programs

- Monitoring and reporting
- Monitoring of Queensland underwater cultural heritage sites
- Open House visitation data collation
- Queensland historic shipwreck survey

Headline initiatives: Heritage

Applicable management responses led by the Department of Environment and Science related to heritage since June 2020 include:

Looking after Country Grant Program

The Looking after Country Grant program provides Aboriginal and Torres Strait Islander groups with grants of up to \$75,000, for projects that care for Country and culture. It supports planning and on-ground work activities and encourages the development of collaborative partnerships in caring for Country.

Project activities funded through the program include cultural site management, protected species monitoring and conservation, revegetation and habitat restoration, feral animal and weed management, fire management, erosion control and the development and implementation of Country management plans.

In 2020, the Looking after Country funding supported 12 applicants with grants up to \$75,000 to support their projects to protect and care for Country, with \$844,239 worth of grants provided. The program is open again in 2021.

Heritage

The Queensland Government is committed to protecting the State's cultural heritage.

The *Heritage Act 1992* (the Heritage Act) provides for the conservation of the state's cultural heritage for the benefit of the community and future generations. Key objectives of the Heritage Act include reporting the discovery of archaeological and underwater cultural heritage artefacts and providing enforcement powers to help protect Queensland's cultural heritage.

The Heritage Act also establishes the Heritage Council, an independent statutory authority which advises the Minister on heritage matters and is responsible for deciding which places are entered in the Heritage Register.

The Heritage Register is a list of the state's most important heritage places and aims to be a comprehensive and representative record of our past. There are over 1790 places across Queensland on the Heritage Register.

The Queensland Heritage Strategy: protecting, investing in and connecting Queensland's story provides the framework for the management of the state's heritage.

The department plays a key role in protecting our heritage, through assessing register applications, deciding applications for minor works on State heritage places and advising on major development affecting State heritage places such as Cross River Rail, the new QPAC theatre and the Queen's Wharf development.

The department's Community Sustainability Action grant program is providing \$18 million for climate change, wildlife protection, and the conservation of Queensland's natural and built environment.

Other Queensland Government departments also continue to deliver valuable initiatives that help protect and conserve Heritage. These will be covered in the next SOE report.



Plastic bag
© iStock.com/Lindsay imagery

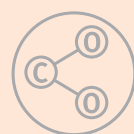
5.0 Pollution

Pollution can affect human health, impact the environment and result in economic costs

While greenhouse gas emissions cause global warming, all forms of pollution can harm our native species and their habitat and impact on the scenic amenity of Queensland's natural areas.

Pollution such as waste generated and the release of toxic chemicals into the air can have an impact on human health and the environment. Poor water quality can contribute to algal blooms, decline in seagrass coverage and coral loss.

The pollution theme is separated into the following sub-themes: Air quality, Water quality, Waste and Greenhouse gas emissions.



Kerbside recycling
© The State of Queensland



Smoke rising into the sky from a bushfire
© The State of Queensland

5.1 Air quality

Air quality is a measure of the purity of the atmosphere, in terms of the quantity of solid, liquid or gaseous air pollutants. The impacts of these pollutants tend to be localised near major sources or groups of sources, since pollutants are continually removed from the atmosphere by processes such as gravitational deposition, rainfall, chemical reaction and solution in water bodies.

The effects of air pollutants can include human health impacts (short term and long term), irritation, nuisance (for example, soiling of surfaces from deposited dust or increased corrosion rates), aesthetics (light scattering, visual range, haze) and flora and fauna impacts.

Why air quality is important

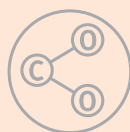
Good air quality is important to maintain environmental health, including human health. Poor air quality can cause reduced visibility and damage our environment and ecosystems. Ground-level ozone damages agricultural crops, forests and plants, reducing their growth rates. Nitrogen oxides and sulphur dioxide harm soil, lakes and rivers which can cause a loss of animal and plant life: ammonia and nitrogen oxides disrupt land and water ecosystems.

Air quality in Queensland has improved over the last three decades, despite pressures from a growing population, and increase in motor vehicle use and industrial growth. Air quality improvements are a result of Queensland's regulation of industry, stricter emissions standards for motor vehicles and new emissions reduction technology.

Pressures

Air pollutant emissions for industrial sources in Queensland have generally been trending slightly upwards for the past seven years. Increases in industrial emissions for a number of key air pollutants reflect increased demand in commodities.

Emissions from motor vehicles are a function of many factors—but most importantly total travel, fleet mix, emission control technology, engine type and driving behaviour.



Key findings | Air quality

AIR QUALITY

Air quality

has **improved** over the **last three decades** and remains relatively good as a result of industry regulation, stricter emission standards for motor vehicles and new emission reduction technology.

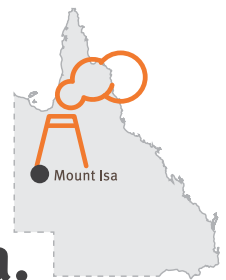
Most measures of air quality

- carbon dioxide
 - lead
 - nitrogen dioxide
 - sulphur dioxide and
 - ozone concentrations
- have **reduced**.

Sulphur dioxide

has occasionally **exceeded** the **standard** in

Mount Isa.



Particle pollution is the most **significant** air quality issue in Queensland with



bushfires and **dust storms** identified as the **main causes**.

In the **past decade**, **exceedances** of the **particle pollution** occurred **only once** in **South West Queensland**, **Blackwater** and **Mackay**, **twice** in **Mount Isa** and **four times** in **Moranbah**.

VEHICLES

Registered motor vehicles (cars, truck, buses, motorcycles, campervans) and the **kilometres** they travel **continue to climb**.



MAJOR AIR POLLUTANTS

The **National Pollutant Inventory** (NPI) tracks air pollutant emissions for industrial sources across Australia.

NPI results for **industrial sources** in Queensland show that **several pollutants** have generally been **trending upwards** for the **past five years** reflecting an **increased demand** in **commodities**.

The main sources of **industrial air pollutants** are from the following sectors:

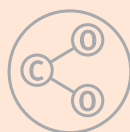
- **primary metal manufacturing**
- **coal mining**
- **electricity supply.**



The **increased production** of **sulfur dioxide** is driven by the primary metal manufacturing sector and particulate matter by the coal mining sector.



Thick smog over Brisbane from local industry and controlled burning
© The State of Queensland





Norman River, Gulf of Carpentaria
© iStock.com/John Carnemolla

5.2 Water quality

Water is essential to human life and the health of the environment. Water quality is commonly defined by its physical, chemical, biological and aesthetic (appearance and odour) characteristics. A healthy environment is one in which the water quality supports a rich and varied community of organisms and protects public health.

Water quality is highly variable year to year in many regions depending on rainfall. As a result, a combination of monitoring and modelling is often used to better understand long-term improvements in water quality.

Why water quality is important

Clean water is needed to protect freshwater, estuarine and marine plants and animals. Poor water quality has been attributed to algal blooms, declines in seagrass and coral loss. It can also affect our drinking water supplies. Many marine systems, such as the Great Barrier Reef, are likely to face a number of pressures from climate change into the future. Improving water quality and reducing some of the local stressors will create resilience against the likely impacts from climate change.

Condition

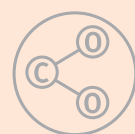
Queensland's aquatic ecosystems vary significantly in condition. Some are in pristine condition while others do not meet standards for water quality. Depending on location, water quality report cards document the state of water quality, habitat condition and other ecosystem features at various spatial and time scales. Regional report card partnerships produce annual water quality report cards for a number of Great Barrier Reef catchments, including Gladstone Harbour, Fitzroy Basin, Mackay-Whitsunday-Isaac, Townsville Dry Tropics, and the Wet Tropics. The Healthy Land and Water Report Card details South East Queensland's aquatic conditions. The Queensland Government QCatchments program conducts water quality assessments for many freshwater systems in Queensland, including the Queensland Eastern Murray Darling. These report cards provide in-depth information on aquatic ecosystem health.

Pressures

The pressures affecting Queensland's aquatic ecosystems vary depending on local conditions and level of development. Broadly, sediments, nutrients and pesticides are the main catchment pressures on our aquatic ecosystems.

Nitrogen and phosphorus are significant contaminants resulting from both diffuse sources (such as farmland) and point sources (such as sewage treatment plants) they cause ecological imbalance through growth of algae and other species.

Climate change is also a significant pressure, particularly to the Great Barrier Reef's long-term outlook.



Key findings | Water quality

UNDERSTANDING WATER QUALITY REPORT CARDS

Regional waterway health report cards provide **finer scale information on water quality in local streams, rivers and bays.**

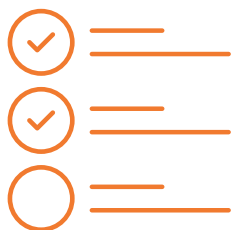
These show that many **waterways** are in **poor condition**, and that the condition is heavily **dependent on rainfall** during the relevant period.



In the 2019 SEQ report card

Moreton Bay zones were found to be in **excellent condition.** ✓

In 2019, the **Outer Harbour zone** had **very good water quality** in the **Gladstone Harbour** report card.



Mackay-Whitsunday-Isaac report card grades vary across different reporting zones: **some** are in **good condition** while others have been more heavily impacted by rural and coastal land use.

The 2019 **Townsville Dry Tropics** report card, water quality was **moderate** in the freshwater ecosystems assessed.

The 2019 **Wet Tropics** report card scored the offshore marine as **very good** and inshore marine as **moderate**.

PRESSURES

Sediments



Pesticides



Nutrients



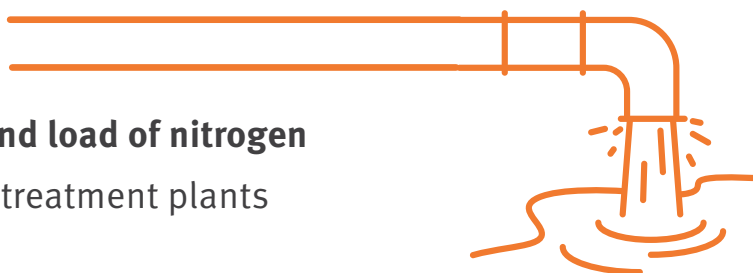
Climate change

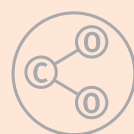


are the **main catchment pressures** on aquatic ecosystems.

Discharge into waterways

Current levels of **contaminants** from **sewage treatment plants** are **relatively stable**. Annual volume and load of nitrogen and **phosphorus** from coastal sewage treatment plants have **reduced** since 2015.







Cans
© The State of Queensland

5.3 Waste

Waste generation and disposal have significant social, economic and environmental costs. Having a decentralised population spread across a vast geographic area presents logistical challenges for waste management in Queensland.

Why waste management is important

Waste is managed to protect human health and environmental quality, and to improve the efficiency of resource use. The amount of waste generated and the proportion of materials recovered are indicators of the sustainability of the community's use of resources. Reductions in the amounts of waste generated and increases in the proportions recovered would suggest improved resource use efficiency.

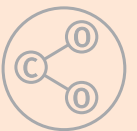
The principles of a circular economy aim to use resources at their highest value for as long as possible, helping retain materials in the economy and reduce the amount of waste generated and disposed of. Examples include rethinking product design to allow for reuse, repair and remanufacture before recycling or energy recovery.

Litter and illegally dumped items are visible indicators of pollution in our environment—adversely affecting aesthetic and environmental values, degrading natural areas, facilitating the spread of pests and weeds, and harming wildlife that eat or are entangled in the waste.

Pressures

Queensland disposes of millions of tonnes of general waste per year. In recent years, the amount of waste sent to landfill in Queensland has been boosted by waste from interstate sources. It is likely that the relatively low costs of landfill disposal in Queensland have been the motivator for this cross-border flow.

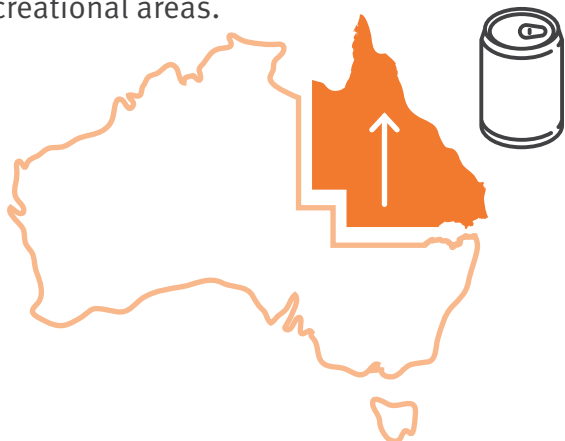
Littering and illegal dumping causes serious environmental impacts, with reports suggesting that the problem is widespread throughout the state.



Key findings | Waste

IMPACT OF LITTER AND ILLEGAL DUMPING

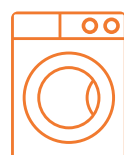
The average number of **littered items** is **higher in Queensland** than **other Australian states and territories**, particularly at beaches, retail strips and recreational areas.



In **2018–19**, **plastic items** replaced cigarette butts as the **most common littered items** in Queensland.



Plastic and paper are frequently littered items, both in terms of number and volume.



Illegal dumping is defined in Queensland as the **unlawful depositing of 200 litres or more of waste**.

Collecting and properly disposing of illegally dumped materials imposes substantial costs, particularly on local government.

WASTE LANDFILLED

1.2 million tonnes (MT) of **domestic kerbside waste** was sent to **landfill** in **2018–19**



a **decrease** from **1.26 million tonnes** in **2016–17**.

2.21 million tonnes (MT) of **construction and demolition waste** was sent to **landfill** in **2018–19**

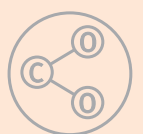


a **decrease** of **385,000 tonnes** from **2017–18** (and 0.714 MT higher than in 2014–15).



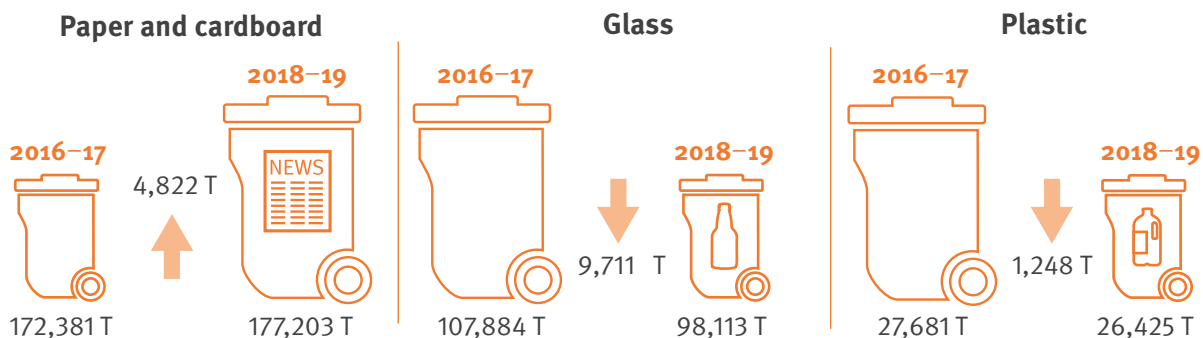
1.61 million tonnes of **commercial and industrial waste** was sent to landfill in **2018–19**

—an **increase** of **121,000 tonnes** from the average amount landfilled during **2014–15 to 2017–18**.

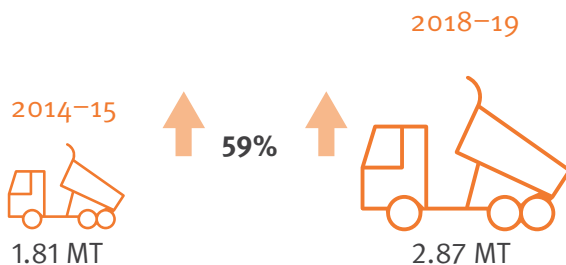


WASTE RECOVERED OR RECYCLED

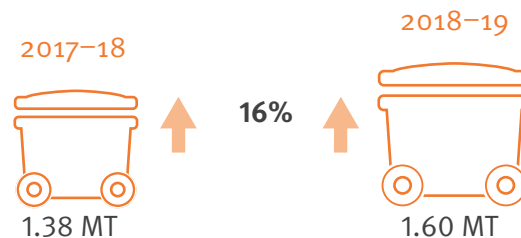
Household waste sent for recycling



Construction and demolition waste recovered

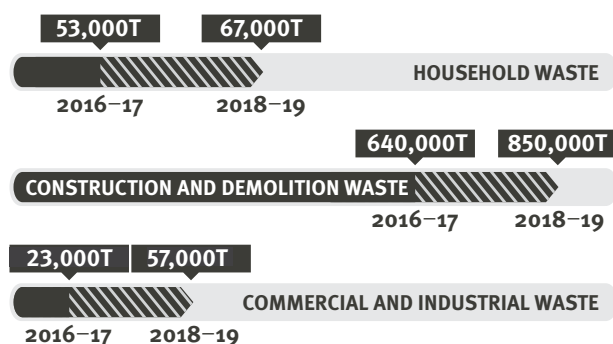


Commercial and industrial waste recovered or recycled



INTERSTATE WASTE RECEIVED

In **2018-19**, the following **wastes generated interstate** were **transported to Queensland landfills** for disposal:



Trackable waste received from interstate **increased** from about **13,000 T** in **2011-12** to about **120,100 T** in **2018-19**





Coal Port, Queensland
© iStock.com/John Kirk

5.4 Greenhouse gas emissions

A greenhouse gas is a gas that traps heat in the atmosphere. Increasing levels of greenhouse gases in the atmosphere from human activities is leading to changes in the global climate system. Activities such as burning fossil fuels for electricity and transport, and deforestation are significant sources of greenhouse gas emissions.

Mitigating the effects of climate change by reducing greenhouse gas emissions is important for the overall health of the environment and can substantially reduce the risks associated with human-induced global warming. Both the Queensland and Australian governments have committed to reducing greenhouse gas emissions.



Key findings | Greenhouse gas emissions

GREENHOUSE GAS EMISSIONS

Queensland accounted for **32%** of Australia's total **greenhouse gas emissions**, the **highest** state/territory **contributor**.



Between 2005 and 2018, Queensland greenhouse gas emissions data showed:



8%

greenhouse gas

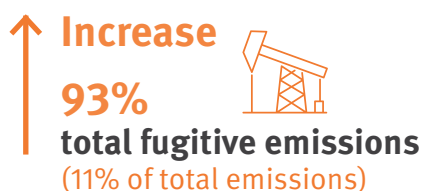
In 2018, Queensland greenhouse gas emissions were 8% lower than in 2005.

66%

land sector

(13% of total emissions)

Queensland is the largest source of this type of emission in Australia.



93%

total fugitive emissions

(11% of total emissions)

This is due to an increase in coal mining and gas production.

1%

waste sector

(2% of total emissions)

Waste emissions have fallen since 2013 due to increased capture and combustion of landfill gas.



26%

transport sector

(13% of total emissions)

Road transport including passenger cars were the main source of emissions.



8%

industrial processes sector

(3% of total emissions)

This is due to the increased use of replacements for ozone-depleting substances.



20%

stationary energy sector

(45% of total emissions)

This sector continues to be the highest source of Queensland's emissions.



1%

agriculture sector

(12% of total emissions)

This is mainly due to emissions associated with beef cattle.





5.5 Management responses

Management responses are the actions or initiatives undertaken to protect, maintain and restore environmental assets, as well as those that prevent, mitigate or adapt to changes in the environment. They are generally developed in reaction to the observed or anticipated pressures and impacts, or the state of the environment. They act in a multitude of ways, either individually or, more often, in concert with one another to bring about environmental change.

Applicable management responses related to pollution included in the SOE 2020:

Legislation

- Container Refund Scheme
- *Environmental Protection Act 1994*
- Euro 5 emission standards
- National Environment Protection (Ambient Air Quality) Measure
- National Environment Protection Measure standards
- Plastic bag ban
- Recycling and Waste in Queensland report
- *Vegetation Management Act 1999*
- Waste Levy
- *Waste Reduction and Recycling Act 2011*

- One million solar rooftops target or 3000 MW solar PV
- Plastic Pollution Reduction Plan
- Point Source Water Quality Offsets Policy
- Queensland Freight Strategy—Advancing Freight
- Reducing emissions from the built environment and infrastructure
- Regional report cards
- Solar 150
- South East Queensland ‘Investing in Our Environment for the Future’ Program
- The Future is Electric: Queensland’s electric vehicle strategy
- Waste Management and Resource Recovery Strategy

Policy and programs

- A net-zero emissions transport roadmap for Queensland
- Carbon farming in Queensland
- Climate Solutions Fund—Emissions Reduction Fund
- Emissions reduction targets
- Energy from Waste Policy
- Government leading by example
- Healthy Waters Management Plans/Water Quality Improvement Plans
- Keeping Queensland Clean; the Litter and Illegal Dumping Plan
- Large-scale Renewable Energy Target and the Small-scale Renewable Energy Scheme
- Litter and Illegal Dumping Online Reporting System
- Low carbon energy and industries
- National Clean Air Agreement
- National Landcare Program
- Natural Resource Investment Program—2018 to 2022

Headline initiatives: Pollution

Applicable management responses led by the Department of Environment and Science related to pollution since June 2020 include:

Waste and resource recovery

Implementation of Queensland’s Waste Management and Resource Recovery Strategy (Waste Strategy) is supported by a waste disposal levy. The Waste Strategy provides the strategic framework to help Queensland become a zero-waste society, where waste is avoided, reused, and recycled to the greatest possible extent.

The Waste Strategy focuses on transitioning to the principles of a circular economy where the value of material is retained in the economy for as long as possible. It provides the framework to help deliver coordinated, long-term and sustained waste avoidance measures, as well as providing a framework for growth in the recycling and resource recovery sector to increase recycling and decrease landfill disposal by promoting more sustainable waste management practices for business, industry and households.

To help achieve the 2050 targets of a 25% reduction in household waste, 90% recovery of waste, and a 75% recycling rate across all waste streams; priority action plans for organics, e-Waste and textiles are currently being developed. The development of the Organic Waste Action Plan by mid-2021 is a 2020 Government Election Commitment.

There is a statutory requirement to review the Waste Strategy every three years, with the next review due to take place by 30 June 2022.

Other Queensland Government departments also continue to deliver valuable initiatives that help address the gaps and opportunities from Pollution. These will be covered in the next SOE report.



Goorganga Plains, Proserpine
© Qld. Museum Network/Gary Cranitch

6.0 Climate

Climate is the long-term pattern of prevailing weather conditions (rainfall, temperature etc.) for a particular locality or region, whereas weather refers to the state of the atmosphere at, or for, a brief period of time.

Queensland's climate variability is strongly influenced by seasonal variations, such as the location and intensity of the summer monsoon season and year-to-year fluctuations in the global climate system related to the El Niño Southern Oscillation phenomenon.

In Queensland, El Niño is often, although not always, associated with below average rainfall throughout winter, spring and summer. La Niña, the opposite of El Niño, is often linked to an increased risk of above average summer rainfall, floods and tropical cyclones.

Queensland's highly variable and changing climate is increasingly influencing the severe weather events we experience.

The climate theme is separated into the following sub-themes: Climate observations and Coasts and oceans.



Lightning, Gold Coast
©iStock.com/Kathy Gould



Cracked earth, Murray Lagoon, Rockhampton
© Qld.Museum Network/Gary Cranitch

6.1 Climate observations

Why climate observations are important

High-quality observations of climate variables are important for understanding historical trends and helping to build resilience to future events.

Climate patterns, variability and change data contributes to informed decision making to help effectively manage for seasonal variability, the effects of climate change and the implementation of appropriate mitigation and adaptation strategies to ensure the economic, social and environmental health of Queensland.

Climate variability statistics help with understanding Queensland's climate, especially in regard to agricultural and water resources. For example, with an understanding of historical climate variability and its drivers, climate outlooks can be developed using statistical modelling for specific periods (i.e. the summer wet season), to help decision-makers plan for future drought and flood events.

Queensland's highly variable and changing climate is increasingly influencing the severe weather events we experience as they are occurring in a more energetic climate system. Whilst overall precipitation rates have fallen, long-term observations have shown that there has been a net increase in the number of heavy to extreme precipitation events since 1951. Such increases have and will continue to yield occurrences of associated major flooding events; the 2019 North Queensland monsoon trough event being the most notable. Whilst severe thunderstorms are a long-standing feature of Queensland's climate, a more energetic climate has resulted in an observed increase in the most damaging severe storm events.

Pressures

Climate observation resulting from pressures include, drought, heatwave events, fire weather and associated bushfire, severe weather events and associated flooding and earthquakes.



Key findings | Climate observations

AVERAGE RAINFALL

In **2016**, **rainfall** was **above average** in **western Queensland**



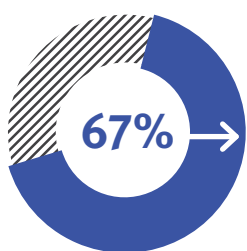
and **below average** in some **northern** and **south-eastern areas**.



Days with **very heavy rainfall** are **common** in **north-eastern coastal locations** and **rare** in the **south west**.



DROUGHT DECLARATIONS



As of **May 2020**, **67%** of Queensland was **drought declared**.

EVAPORATION RATE

Annual evaporation is typically much **higher** in **inland** parts of **Queensland** than in coastal and sub-coastal areas.



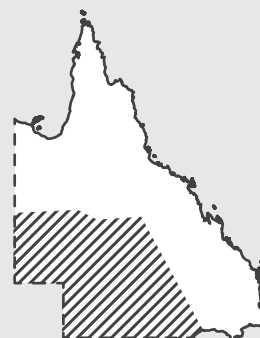
TEMPERATURE

The **Annual average temperature** across Queensland **increased** by about **1°C** since **1910**.

Most of this warming has occurred over the **past 50 to 60 years**.



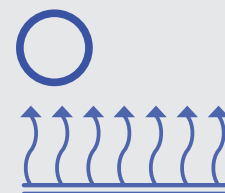
The **strongest warming** since **1960** has been observed in **inland parts** of the state.



2015 to 2019 was Queensland's **warmest 5-year period** on record.



Extreme hot days were **more frequent** than **average** at several **inland locations** between **2013 and 2018**.





FIRE WEATHER AND ASSOCIATED BUSHFIRE HAZARD

From 1950–2018 Queensland saw **increased severity** in the **fire-weather** season **due to climate change.**



HEATWAVE EVENTS



Between **1986 to 2015**, about **80%** of Queensland has experienced an **average** of **3 heatwave events per year.**

EARTHQUAKE HAZARD

The state's **south-east** is the **most at risk** of experiencing an earthquake.

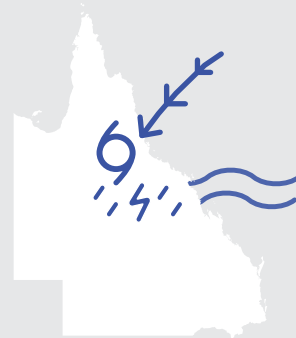


SEVERE WEATHER EVENTS AND ASSOCIATED FLOODING HAZARD

Queensland has been directly impacted by

8 severe tropical cyclones and more than **20 cyclones of other intensities** since 2010.

Observations suggest there has been a **rise in extreme severe weather** events **due to climate change.**





Coastline, Cooktown
© The State of Queensland

6.2 Coasts and oceans

The coast is the interface between the land, ocean and atmosphere. Sea surface temperatures around Queensland (particularly in the Coral Sea, but also in the Gulf of Carpentaria) provide an indicator of the likelihood of the formation and development of tropical cyclones and east coast lows.

Warmer than average sea surface temperatures favour the development of these weather systems, which often bring flood-producing rainfall and damaging wind and storm surges to coastal Queensland. While a recent change in the mean sea level is not significant, sea level rise over the historical tide gauge record is discernible.

Coastal hazards impact on both the natural environment and human settlements. Coastal erosion and storm tide inundation are part of normal coastal processes albeit at the extreme end of natural fluctuations.

Understanding the risks associated with coastal hazards can improve decision making for managing the natural environment and new urban development. It can also help build resilience for existing development that is exposed to these hazards.

Pressures

Coastal erosion continues to impact the Queensland coast, with several major incidents at developed areas.

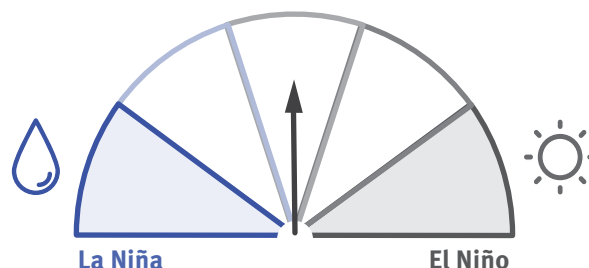
A climate change sea level rise factor of 0.8m by 2100 has been incorporated into hazard mapping.



Key findings | Coasts and oceans

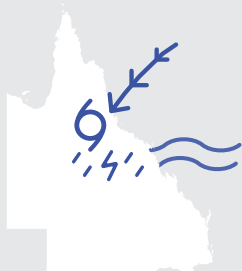
SOUTHERN OSCILLATION INDEX

A **transition** occurred from **El Niño** conditions at the start of **2016** to **neutral conditions** from **2017**.



CYCLONE ACTIVITY

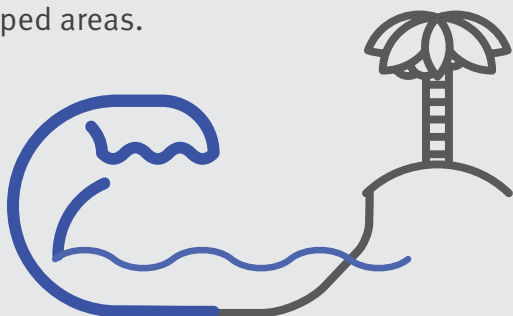
8 cyclones were experienced between **1 January 2018** and **1 April 2020**.



This includes cyclones in the Coral Sea that, while not crossing the Queensland coast, still had wind and wave impacts.

EROSION PRONE AREA

Coastal erosion continues to **impact** the **Queensland coast**, with **several major incidents** at developed areas.



SEA LEVEL

Historical tide gauge **records show** a trend of mean **sea level rise**.

Tide gauges at Rockhampton and Townsville indicate a trend the same as the **global mean sea level rise trend of 3.2 ± 0.4 mm/year**.

Different regions can exhibit seasonal, **decadal** and **multi-decadal changes** in **sea level** due to **weather patterns**.



SEA SURFACE TEMPERATURE

Sea surface temperatures across northern **Australia** are now almost **1° Celcius warmer**, on average, than they were **100 years ago**.





Elim Beach, Hope Vale Queensland
© iStock.com/Dominic Jeanmaire



6.3 Management responses

Management responses are the actions or initiatives undertaken to protect, maintain and restore environmental assets, as well as those that prevent, mitigate or adapt to changes in the environment. They are generally developed in reaction to the observed or anticipated pressures and impacts, or the state of the environment. They act in a multitude of ways, either individually or, more often, in concert with one another to bring about environmental change.

Applicable management responses related to climate included in the SOE 2020:

Legislation

- Coastal Management District
- *Coastal Protection and Management Act 1995*

Policy and programs

- Building community capacity and resilience
- Coastal Management Plan
- Disaster Recovery Funding Arrangements (DRFA)
- Natural Disaster Relief and Recovery Arrangements (NDRRA)
- QCoast2100
- Queensland State Disaster Management Plan
- Sea level rise
- Sector Adaptation Plans
- Shoreline erosion management plans
- State Earthquake Risk Assessment (and the Tsunami Guide for Queensland)
- State Heatwave Risk Assessment
- State Natural Hazard Risk Assessment 2017
- Supporting local governments and regions to adapt

Headline initiatives: Climate

Applicable management responses led by the Department of Environment and Science related to climate since June 2020 include:

QCoast 2100

Since 2015, over \$13.2 million in funding has been provided by the Queensland Government through the QCoast2100 program to eligible local governments, with an additional \$3 million over two years (2020–2022) being allocated to expand the program's objectives.

The QCoast2100 program is delivered through the Local Government Association of Queensland. Funding enables all Queensland coastal local governments to progress the preparation of plans and strategies to address climate change related coastal hazard risks over the short, medium and long-term through the development of a Coastal Hazard Adaptation Strategy.

To date, 31 Queensland local governments have been supported by funding from QCoast2100.

Other Queensland Government departments also continue to deliver valuable initiatives that help address the gaps and opportunities from Climate. These will be covered in the next SOE report.





7.0 Liveability



Human settlements can be a major driver of environmental change, through land use change as populations grow and expand, putting pressure on the natural environment.

This chapter focuses on how population growth and the expansion of human settlements can affect our communities and quality of life. It can also cause changes in land use, not just in urban areas, but also in adjacent rural locations, and the liveability of these areas is important.

Most people live in urban areas along Queensland's east coast, with more than 70 per cent of the state's population living in South East Queensland.

The liveability theme is separated into the following sub-themes: Urban and Rural.



Murgon Town, Queensland



Bardon, Brisbane
© The State of Queensland

7.1 Urban

Why urban settlements are important

Good design and planning is essential for creating more liveable urban areas while reducing impacts on the environment. New housing types that meet changing lifestyles and demographic needs can improve housing choice and affordability and help minimise urban sprawl. Well-planned, higher density residential areas can create more connected communities by providing easy access to essential services as well as green spaces and outdoor recreation areas.

An efficient, reliable transport network also plays an important role in improving the liveability of urban settlements and reducing emissions. High-quality, high-frequency public transport systems provide economic and social benefits, improve social cohesion and help reduce pollution. Good bikeway networks in urban areas can promote healthy living by reducing a dependence on cars and encouraging a more active lifestyle.

Pressures

Numbers of light commercial and heavy freight vehicles have increased substantially. Commercial vehicles potentially have greater emissions that affect public health and the environment.

The extent of urbanisation varies greatly across Queensland, the most urbanised regions are in the east and south of the state.



Key findings | Urban

HOUSING

Queensland's **housing stock** is **dominated** by **detached dwellings**, but the number of **high-rise dwellings** is **increasing**.



Of Queensland's total housing stock:



76% are **detached dwellings**



20% are **attached dwellings** (1–3 storeys)



5% are **high-rise dwellings**

CHANGE IN URBAN LAND USE EXTENT

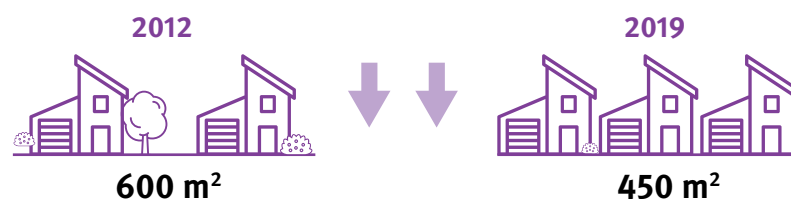
The **most urbanised regions** are in—

- South East Queensland NRM region (15.50%),
- Reef NRM region (4.10%),
- Burnett Mary NRM region (2.80%), and
- Wet Tropics NRM region (2.27%).

134,184 dwellings were **approved** in Queensland in **2016–2019**, of these **117,573** were in **South East Queensland**.



Median lot sizes for **urban lots** **decreased** from



Dwelling density increased from **11.4 dwellings per hectare** in 2011 to **13.5 per hectare** in 2016.

TRANSPORT

The number of **light commercial vehicles** registered has more than doubled between **2001 and 2019**.



49% increase in the the number of **heavy vehicles** registered between **2001 and 2019**.



Use of **monitored bikeways** in **SEQ** has increased. ↑

The **average daily** count at Veloway 1

(Woolloongabba, Brisbane) **increased** from **1,450** in 2017 to **1,695** in 2019.



Average road-network **commute travel times** **increased marginally** between **2017 and 2019**:
morning peak hour 11.3 to 11.5 mins per 10 km
afternoon peak 11.9 to 12.1 mins per 10 km.

On-time running for **SEQ public transport** in **2018–19**:



Train
95.02%



Bus
93.44%



Tram
99.80%



Light Rail (G:Link) service, Gold Coast
© iStock.com/BeyondImages





Sugarcane
© The State of Queensland

7.1 Rural

Why rural settlements are important

Queensland has a vast land area across a wide variety of climate zones and soil types, and rural settlements are essential in supporting our regional and rural communities and industries.

By better understanding Queensland's landscape, climate zones and soil types, we can develop appropriate practices to help increase crop yields and productivity of the land while still considering the natural environment around it to help conserve these areas for future generations.

Effective planning and management is essential for ensuring the long-term sustainability and prosperity of Queensland's environment and its communities.

Pressures

Changes in rural land use, for purposes such as urban development or conservation protection, put pressure on Queensland's finite land resources available for agricultural production.

Additionally, long-term drought and extreme monsoonal rainfall can have significant impact on pastoral growth in Queensland.



Key findings | Rural

GROUND COVER

Ground cover in **grazing lands** across Queensland **declined** in **2019 (57%)** compared to the long-term mean (**64%**).



SOIL AND LAND

71% of Queensland's land resource is mainly **suitable for grazing**.



Only **9%** is suitable for **intensive high-productivity agriculture**.



BROAD ACRE AGRICULTURE PRODUCTION



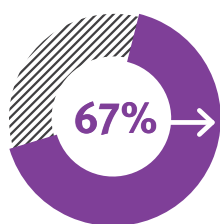
Broadacre agriculture production grew **8%**, reaching **35.5 million tonnes** in **2017–18**, mostly due to increased sugar cane production.

EXTENT OF CROPPING



Queensland **grew** an average of **3.86 million hectares** of **crops** per year for the **last 10 years**.

RAINFALL AND PASTURE GROWTH



Queensland grazing lands continued into the **9th successive dry year**, with **67%** of the **state drought-declared**. Widespread rainfall and pasture growth respite began in **mid-January 2020**.

Queensland has endured **dry conditions** for **8 years** (April 2012 – March 2020). Rainfall for this dry period was **37% below** the **previous (wet) period** that lasted for **5 years** (April 2007 – March 2012).



CHANGE IN AVAILABLE SOIL AND LAND RESOURCES

<0.1% of the state changed **land use** from **1999 to 2019**.

3.6% of land capable of **agricultural production** became **unavailable for agriculture**, mainly due to **conservation**.

CHANGE IN RURAL LAND USE EXTENT

The proportion of **Queensland** that is **rural land not settled** has **increased by 6.9 million hectares (or 34.26%)**. (Such as **National parks** and other **conservation reserve tenures**).

Cape York NRM region experienced the **greatest increase of 38.1%**.

Southern Gulf NRM region experienced the **least increase** of **3.0%**.



HORTICULTURE PRODUCTION

Horticulture production increased **10%** to **1.18 million tonnes** in **2017–18**.



LIVESTOCK AND MEAT PRODUCTION

From **2013–14 to 2017–18**:

- **Beef, sheep and lamb** numbers **decreased** by nearly **7%**
- **Pig** numbers **increased 11%**
- **Egg** production **increased** by **4%**
- **Wool** production **declined** by **23%**
- **Milk** production **declined** by **9%**.

7.3 Management responses

Management responses are the actions or initiatives undertaken to protect, maintain and restore environmental assets, as well as those that prevent, mitigate or adapt to changes in the environment. They are generally developed in reaction to the observed or anticipated pressures and impacts, or the state of the environment. They act in a multitude of ways, either individually or, more often, in concert with one another to bring about environmental change.

Applicable management responses related to liveability included in the SOE 2020:

Legislation

- *Planning Act 2016*
- Transport Coordination Plan 2017–2027

Policy and programs

- Cooperative and Automated Vehicle Initiative (CAVI)
- Improving the capacity of the transport network
- Introduction of QLDTraffic
- Land Condition Assessment Tool (LCAT)
- Local government planning schemes
- Preserving transport corridors
- Providing efficient public transport
- QDESIGN
- Queensland AgTrends
- Queensland Cycling Strategy
- Queensland Freight Strategy—Advancing Freight
- Queensland Soil Monitoring Program
- Queensland Transport Strategy
- Queensland Walking Strategy 2019–2029
- Reduced fares for South East Queensland public transport users
- Regional Planning Program
- Regional transport plans
- South East Queensland's Rail Planning Program
- State of the Forests Report (SOFR) 2018
- State Planning Policy
- The Future is Electric: Queensland's Electric Vehicle Strategy

Headline initiatives: Liveability

Applicable management responses led by the Department of Environment and Science related to liveability since June 2020 include:

Land Condition Assessment Tool

Land condition data underpins sustainable land management initiatives across Queensland—from influencing practices that keep vast grazing resources productive and sustainable, supporting communities and industries, to reducing sediment and improving water quality flowing to the Great Barrier Reef.

The Land Condition Assessment Tool (LCAT) is a science-based assessment framework that the Queensland Government has developed, combining simple design and contemporary technologies. Implementation and training in the use of LCAT commenced in early 2020.

Unlike land resource assessments which focus on land capability, LCAT determines the current state of the land, by evaluating key indicators of long-term land condition. Data from long-term grazing trials demonstrates that as land condition declines, productivity declines.

The Queensland Electric Super Highway

The Minister for Transport and Main Roads released *The Future is Electric: Queensland's Electric Vehicle Strategy (EV Strategy)* on 4 October 2017. The EV Strategy is the beginning of a new era in transport fuel sources that will also include bio-fuels and alternative new technologies such as hydrogen to support environmentally-friendly transport options, particularly from renewable energy.

The EV Strategy is positioning Queensland for an increase in electric vehicles. It outlines 16 cost-effective initiatives to empower consumers, enable supporting infrastructure, explore cost-effective support programs and envisage future government actions.

One of the key actions from the EV Strategy is the Queensland Electric Super Highway, which includes a series of 18 fast charging stations from Coolangatta north to Cairns and Brisbane west to Toowoomba, completed in 2018.

Planning for stage 2 of the Queensland Electric Super Highway, and additional fast charging stations, was well underway during the reporting period.

