Queensland State of the Environment 2015

In Brief

Queensland Government

Prepared by: Department of Environment and Heritage Protection

October 2016

#30944

Front Cover Image: © Department of Natural Resources and Mines, Crab Island—Normanton Queensland.

Foreword

The State of the Environment report is a public statement on the condition of our environmental assets and examines how we are addressing key challenges and pressures affecting Queensland's biodiversity, heritage, pollution and climate.

In an Australian-first, Queensland's State of the Environment 2015, moves to a web-based format.

Developed by the Department of Environment and Heritage Protection, the website represents a significant innovation in environmental performance reporting.

Using data visualisation and open data integration, the online report provides a platform to analyse and interact with the information through access to spatial data and maps with regionally-specific interpretive text, tables, graphs and charts.

To achieve this level of detail, a new suite of targeted indicators was established.

This new platform enables us to update the State of the Environment report more frequently and we will do so by moving to biennial updates. This will improve our environmental accountability and deliver greater transparency for all Queenslanders on the state of our environment.

Assessment summaries and video vision assist with greater appreciation and understanding of the information specific to the four key report themes.

Developing such an innovative reporting tool is a team effort and I would like to acknowledge the contribution of the many individuals and organisations whose dedication and commitment were integral to transforming an idea into a reality.

Improving how we share knowledge on the condition of our environment—as well as the pressures and challenges—will support better environmental management and better outcomes for our natural heritage, our communities and our economy.

By working together we can all play our part in ensuring a healthy and resilient environment for a sustainable and prosperous Queensland.

Steven Miles.

Dr Steven Miles MP
Minister for Environment and Heritage Protection and
Minister for National Parks and the Great Barier Reef

Jim Reeves
Director-General

Contents

Introduction

The Queensland State of the Environment 2015 report provides an assessment of Queensland's environmental performance for the period 2012–2015, 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 four themes—biodiversity, heritage, pollution and climate.

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

- extent and condition (state)
- pressures.

For the first time, the 2015 report is available in a web-based format—**www.qld.gov.au/state-of-the-environment**

This Queensland State of the Environment 2015 In Brief report provides a high-level overview of some of the information included on the website.

It includes key findings related to each of the themes and sub-themes, as well as management responses to the observed or anticipated pressures and impacts. In addition, the In Brief report contains a separate section on the Great Barrier Reef—due to the Reef's size and complexity and its values which cut across multiple themes.

The In Brief report 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. Where relevant, data source information is included on the website.

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

1.0 Great Barrier Reef

Understanding the Great Barrier Reef

The Great Barrier Reef is one of the world's largest and most diverse marine ecosystems, with a wide range of habitats and many thousands of different species recorded.

The Great Barrier Reef is unique in that it stretches more than 2,000 kilometres and is the only living structure visible from space. The Reef provides 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.

Within the Great Barrier Reef, most ecological processes are considered to be in good condition; however the inshore southern two-thirds of the region are in decline. Over the past 30 years, coral cover has declined by nearly 50% on mid-shelf and off-shore reefs.

The Great Barrier Reef faces a number of pressures. Crown-of-thorns starfish are a major predator of coral: evidence suggests increased nutrient loads contribute to more frequent outbreaks which result in coral cover decline. Climate change is predicted to have far-reaching consequences for the Reef ecosystem over the next 50 years. As climate changes, coral bleaching is predicted to become more frequent and severe. In 2015, the northern section of the Great Barrier Reef experienced large scale bleaching—a stress response to higher than average water temperatures.

Land-based run-off from agricultural practices is another key pressure on the Great Barrier Reef. Other pressures include loss of wetlands, coastal habitat changes and reductions in connectivity, direct use and population growth.

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 46** marine world heritage areas.

EXTENT

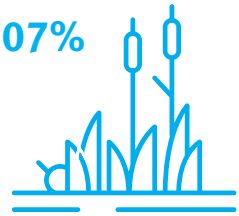
The Great Barrier Reef World Heritage Area covers 348,000km²

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

92% of **pre-clear—estuarine wetland**

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

Loss of estuarine wetland during **2009—13 period** was **294ha —0.07%** of the 2013 extent. Of this, **260ha** was **salt marsh/salt flat wetlands** and **27ha** was **mangrove wetland** in the Calliope catchment.



CONDITION

The outstanding universal value of the Great Barrier Reef remains in good condition, but the overall condition of **some key attributes** is poor and many have **deteriorated** since its world heritage listing in 1981.

Those assessed as being in overall poor condition now are:

Coral Reef & Seagrass Meadow Habitats

Marine Turtles

Seabirds

Dugong

CONDITION

Key **reef ecosystems** show **declining trends** in **condition** due to:

- × **continuing poor water quality**
- × **cumulative impacts of climate change**
- × **increasing intensity of extreme weather.**

Inshore coral reefs

have **improved** **since 2011–12** however remain in **poor condition overall.**

Inshore seagrass

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

PRESSURES

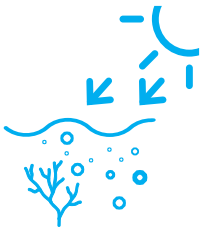
Declining marine water quality

is one of the most **significant threats** to the Reef however **agricultural practices** are **improving,** resulting in **reductions in land-based run-off** entering the region.

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

Excess nutrients from **agricultural fertilisers** and **fine sediment** from erosion of **agricultural lands** pose the **greatest water quality risks.**

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



Agricultural chemicals such as **pesticides** pose a **risk to freshwater** and some **inshore and coastal habitats.**

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.**

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.

Management responses related to the Great Barrier Reef include:

Great Barrier Reef Region Strategic Assessment

The Great Barrier Reef Region Strategic Assessment was undertaken in two parts—one by the Australian Government and one by the Queensland Government—to assess the likely impacts of actions on relevant matters of national environmental significance including the Outstanding Universal Value of the Great Barrier Reef World Heritage Area, and the management arrangements to deal with such impacts.

The assessment looked at the marine environment and adjacent coastal zone, examining how natural and heritage values can be protected into the future. The strategic assessment feeds into the Australian and Queensland governments' Reef 2050 Long-Term Sustainability Plan, an overarching framework for improving the Reef's resilience.

As part of the strategic assessment of the Great Barrier Reef World Heritage Area and adjacent coastal zone, the Great Barrier Reef Marine Park Authority is required to assess the effectiveness of its management arrangements to protect the values that underpin matters of national environmental significance within the Great Barrier Reef Region.

Management effectiveness is strongest on issues limited in scale or intensity and presenting only minor or moderate complexity such as defence and research activities. Tourism operates across much of the region and is moderately complex. It has received significant management attention and is effectively managed.

Management effectiveness challenges are evident for those broad scale issues which are complex socially, biophysically and jurisdictionally. These include ports, shipping, climate change and extreme weather, coastal development, water quality protection, commercial and recreational fishing and indigenous heritage.

Great Barrier Reef Outlook Report

Every five years, the Outlook Report examines the Great Barrier Reef's health, pressures and likely future. It provides a snapshot of current condition and trend of values and threats (through theme assessments). It also examines progress in protecting the Reef through an assessment of management effectiveness.

Achievement of desired outcomes is highly variable across the management topics. Objectives in relation to community understanding of issues and development of effective partnerships are being achieved. Outcome performance is especially strong for research activities, shipping and defence activities.

The report shows that, climate change has the weakest performance followed by coastal development, land-based runoff and fishing. For land-based runoff, the continued poor outcomes for the region are likely due to scale of the problem and lags within the natural system.

Crown-of-thorns starfish response

The Australian Government funds a crown-of-thorns starfish management program which involves manually injecting starfish to protect coral cover on priority reefs, particularly prime tourism sites.

The program involves dedicated dive teams from the Association of Marine Park Tourism Operators, with support from the Queensland Parks and Wildlife Service and the Great Barrier Reef Marine Park Authority. In 2014, the Reef and Rainforest Research Centre also joined management efforts.

The control program is made up of three elements:

- intelligence and dedicated surveillance to detect crown-of-thorns starfish and assess coral health
- a highly trained control team to cull the starfish using injection methods and to assess changes in coral health
- a comprehensive reef health database to monitor effectiveness of control efforts and adaptively manage the program.

The prevalence of crown-of-thorns starfish is monitored through programs such as the Field Management Program, the Australian Institute of Marine Science's long-term monitoring program and the Eye on program.

Data about crown-of-thorns starfish populations is entered into the Eye on the Reef database, enabling the effectiveness of the control program to be assessed and to help decide which sites need to be revisited and how often. A number of prime tourism reefs have also been selected for long-term monitoring to establish the change in coral cover over time.

Reef 2050 Long-Term Sustainability Plan

The Reef 2050 Plan is the overarching framework for protecting and managing the Great Barrier Reef from 2015 to 2050. The plan is a key component of the Australian Government's response to the recommendations of the UNESCO World Heritage Committee. At its core is an outcomes framework that will drive progress towards an overarching vision:

> "To ensure the Great Barrier Reef continues to improve on its Outstanding Universal Value every decade between now and 2050 to be a natural wonder for each successive generation to come."

Reef Trust

The Australian Government has committed $140 million to the Reef Trust to provide innovative, targeted investment focused on improving water quality, restoring coastal ecosystem health and enhancing species protection in the Great Barrier Reef region.

This program implements the Reef 2050 Plan. Monitoring and evaluation will be delivered through the Reef 2050 Integrated Monitoring and Reporting Program (RIMReP). While RIMReP is currently being designed it is anticipated that the Reef Report Card and the Paddock to Reef Integrated Monitoring Modelling and Reporting Program will deliver the water quality monitoring and evaluation components of the RIMReP.

Reef Water Quality Protection Plan 2013

The Reef Water Quality Protection Plan (Reef Plan) is a collaborative program of coordinated projects and partnerships designed to improve the quality of water in the Great Barrier Reef through improved land management in reef catchments.

The plan is a joint commitment of the Australian and Queensland governments. Its primary focus is diffuse source pollution from broad-scale land use.

Reef Plan sets ambitious but achievable targets for improved water quality and land management practices and identifies actions to improve the quality of water entering the Reef. It details specific actions and deliverables to be completed by 2018 when Reef Plan will be reviewed.

The Great Barrier Reef Report Card (Reef Report Card) measures progress towards the Reef Water Quality Protection Plan (Reef Plan) goal and targets for improved water quality, land and catchment management. Through the Paddock to Reef Program, a combination of monitoring and modelling is used to assess reductions in sediment, nutrients and pesticides at the end of catchments that flow to the Reef. The area of agricultural land managed using best practice systems is also assessed, along with key catchment health indicators such as groundcover, riparian extent and the extent and improvement in ecological processes and environmental values of natural wetlands.

Great Barrier Reef Report Card and Paddock to Reef Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef Program)

The Great Barrier Reef Report Card assesses progress towards the Reef Water Quality Protection Plan (Reef Plan) goal and targets for improved water quality, land and catchment management. Through the Paddock to Reef Program, a combination of monitoring and modelling is used to assess reductions in sediment, nutrients and pesticides from the paddock-scale to the end of catchments that drain to the Great Barrier Reef.

Paddock monitoring assesses water quality improvements from different land management practices. Catchment loads monitoring tracks long-term trends in water quality entering the Reef from high priority catchments and is used to validate modelling. Inshore marine water quality is also assessed. All of the information is combined in the annual Reef Report Card.

2.0 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 6,900 kilometres 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.

2.1 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 tool to provide a measure of how well a terrestrial ecosystem is functioning for the maintenance of biodiversity values at a local or property scale. The tool is site-based and has a quantitative and repeatable assessment procedure. Benchmark descriptions for each of the state's currently recognised 1,383 regional ecosystems are being compiled for the tool, with 340 available. While the tool can be used for assessing condition at a site and extrapolated to an area, there is no established program for mapping condition of vegetation on a regional basis in Queensland.

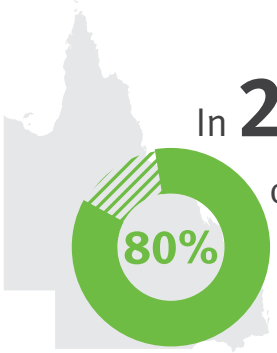
Pressures

- 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.

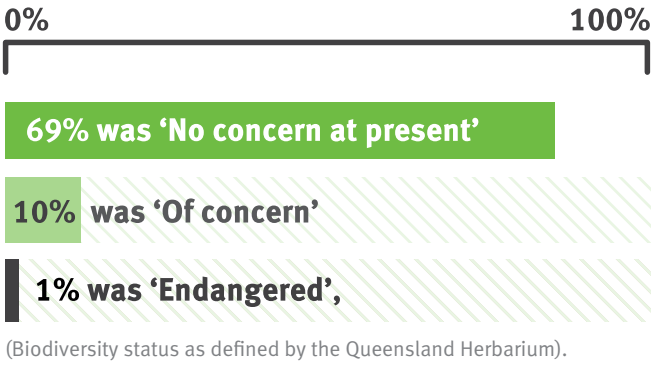
- Land clearing, predominantly for pasture, and fragmentation are significant pressures on terrestrial ecosystems. Fragmentation—the 'breaking up' of large areas of intact native vegetation for the purposes of clearing for development—reduces the ecological connectivity between habitats which allows for wildlife to cross the landscape for food, breeding and, ultimately, survival.

Key findings | Terrestrial ecosystems

REGIONAL ECOSYSTEMS

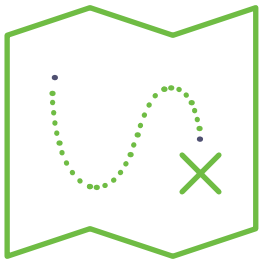


In 2013 about **80%** of the **state** contained **remnant regional ecosystems.**

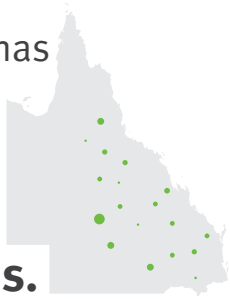


(Biodiversity status as defined by the Queensland Herbarium).

Surveying and **mapping** of regional ecosystems has been **completed for 97%** of Queensland showing the extent of **native vegetation remaining** from pre-settlement clearing.

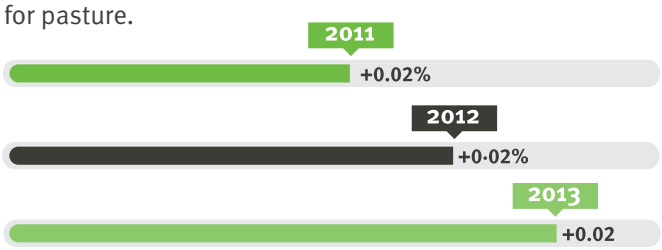


Queensland has **1,383 regional ecosystems.**

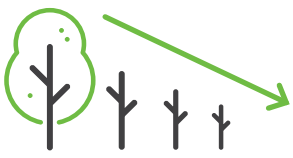


EXTENT AND RATE OF CHANGE

In **2011–13,** rates of **remnant native vegetation loss increased** to **0.02% per year,** mainly due to clearing land for pasture.



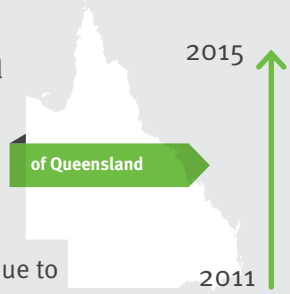
As at **2013, two Broad Vegetation Groups** (mainly comprising acacia and eucalypt forests) had **less than 60%** remnant **native vegetation.**



PROTECTION

Remnant vegetation covers **80%** of the **state** with **9%** of this **remnant vegetation** in **protected areas.**

The protected area estate (including national parks and nature refuges) **covers 7.9%** of Queensland an **increase** of **3 million hectares** between 2011–15 largely due to an increase in nature refuges.



LAND CLEARING

In 2014–15, 296,000 hectares per year of woody vegetation was **cleared,** an **increase** of

→ **91%** from **2011–12**

Pasture

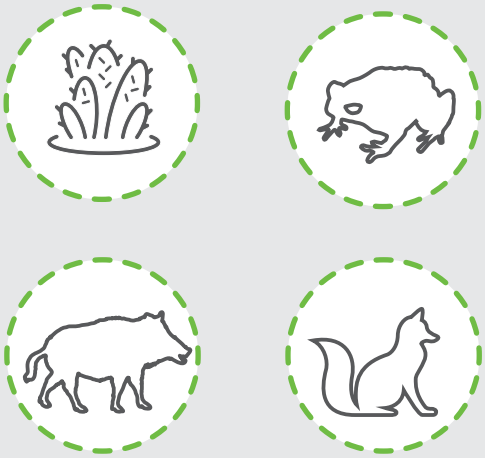
(which includes clearing for grazing, thinning, fodder, rural residential, future urban land use and privately owned plantations)

was the dominant replacement landcover class, contributing to

91% of the **total statewide clearing.**

INVASIVE NON-NATIVE SPECIES

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



FRAGMENTATION

South East Queensland is the most **heavily fragmented bioregion** with **only** **13.7%** comprising **remnant intact patches** of **1,000 hectares or more.**

2.2 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 6 metres 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. Currently there is a lack of information about the condition of freshwater ecosystems, however the Queensland Government has committed to supporting a number of regional waterway health report cards in the Great Barrier Reef, including existing Gladstone, Fitzroy and Mackay-Whitsundays report card partnerships, and expanding into other areas including Wet Tropics, Burdekin and Burnett Mary. The Healthy Waterways Report Card details South East Queensland's aquatic conditions.

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

2.2 Aquatic ecosystems

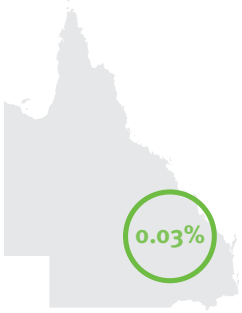
Pressures

- 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 remains largely free of invasive non-native marine flora and fauna species (marine pests), despite a high possibility of introduction through international shipping activity. Asian green mussels have been detected on vessels on a number of occasions however rapid response to the detections mean no populations are known to have established.
- 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.

Key findings | Aquatic ecosystems

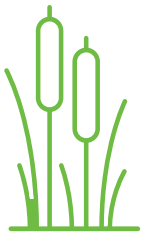
EXTENT AND RATE OF CHANGE

In **2013**, 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.**



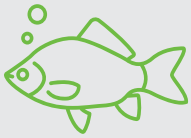
Since 2001, the **highest rate** of **estuarine wetland loss** was **0.03%** — occuring in the **North East Coast drainage division** during **2009–13**.

Freshwater wetland loss during **2009–13** was **0.03%.** The greatest ongoing losses occurred in palustrine and riverine systems in the Murray Darling and North East Coast Drainage divisions.



CONDITION

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



PROTECTION

36% of **estuarine wetlands across Queensland** are within an area of **managed protection** (which often overlap). This includes:

26% in declared fish habitat areas
12% in highly protected marine park zones
5% in protected areas.

8% of **freshwater wetlands** in **Queensland** are within **protected areas.** The majority are palustrine systems and within national parks.

1.8 million hectares of **marine wetlands in Queensland waters** are in, **highly protected marine park zones** or a **declared fish habitat area**, representing about **17%** of the state's **total marine wetlands.**

2.3 Species and habitat

Queensland has some of the most naturally diverse species and habitat 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 close to 13,000 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 tool to provide a measure of how well a terrestrial ecosystem is functioning for the maintenance of biodiversity values at a local or property scale. The tool can be used for assessing vegetation condition (and, by extension, the habitats it supports) at a site and extrapolated to an area. There is no established program, however, for mapping condition of vegetation on a regional basis in Queensland.

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

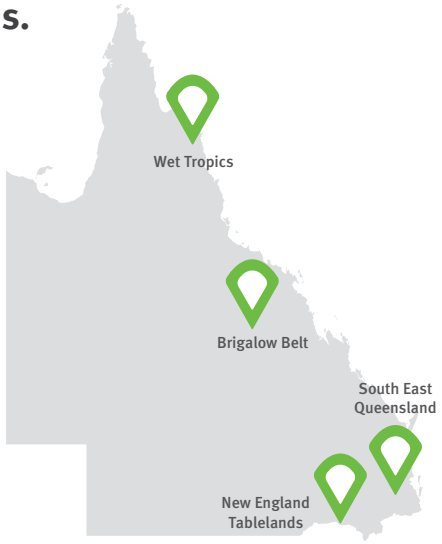
Pressures

- 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
  - clearing of vegetation
  - inappropriate grazing regimes
  - weeds.
- Land clearing for pasture (which includes clearing for grazing, thinning, fodder, rural residential, future urban land use and privately owned plantations) is the greatest pressure on threatened fauna and flora pre-clearing habitat. Clearing has almost doubled since 2011–12.
- The greatest loss of pre-clearing threatened flora habitat occurred in the New England Tableland, South East Queensland, Brigalow Belt and Mulga Lands bioregions. For threatened fauna the greatest loss of pre-clearing habitat occurred in the New England and South East Queensland bioregions.

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, Brigalow Belt and New England Tablelands bioregions.**



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**

THREATENED SPECIES NUMBERS

An additional **61** fauna species **were listed as vulnerable, endangered or extinct in the wild** in Queensland between **2007** and **2015**.

3 frog species have been listed as **extinct in the wild.**

An additional **275** flora species were listed as **threatened** in Queensland between **2007** and **2015**.

4 flora species have been **removed** from the **'extinct in the wild'** status.

2.4 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.

Management responses related to biodiversity include:

Vegetation Management Act 1999

The Vegetation Management Act 1999 regulates the clearing of vegetation in Queensland in a way that:

- conserves remnant vegetation
- ensures clearing does not cause land degradation
- prevents loss of biodiversity
- maintains ecological processes
- reduces greenhouse gas emissions
- allows for sustainable land use.

Key changes to the vegetation management framework in December 2013 included:

- de-regulation of the clearing of high value regrowth regulations applying to freehold and indigenous lands
- creation of new provisions requiring the development of self-assessable vegetation clearing codes for a range of clearing purposes
- creation of three new clearing purposes under the *Vegetation Management Act 1999* for high value agriculture clearing, irrigated high value agriculture clearing, and environmental clearing
- simplified and streamed vegetation mapping; and removal of particular offence and penalty provisions under the *Vegetation Management Act 1999* and the *Land Act 1994*.

The 2012–14 *Statewide Land Assessment* and *Tree Study (SLATS)* report showed an increase in annual clearing rates from 153,638ha in 2011–12 to about 266,191ha in 2012–13, and 296,324ha in 2013–14.

The Queensland Government has committed to meeting its election commitment, as well as commitments under the Reef 2050 Long-Term Sustainability Plan (Reef 2050 Plan), to reinstate its nation leading vegetation management protections to save the Great Barrier Reef and reduce carbon emissions.

Environmental Offsets Act 2014

Environmental offsets are actions that provide environmental benefits which counterbalance the significant residual environmental impacts or risks of a project or activity. Unlike mitigation actions which occur on-site as part of the project and reduce the direct impact of that project, offsets are undertaken outside of the project area and counterbalance significant residual impacts.

Until 1 July 2014, environmental offsets in Queensland were administered by different Queensland Government agencies under five separate offsets policies, each of which had their own distinct rules and criteria for meeting an offset obligation. Each agency was responsible for maintaining its own offset records: there was no formal requirement to maintain a single combined offsets dataset or deliver offsets in a coordinated and strategic manner.

A review of the existing offset policies was conducted between 2012 and 2013 in conjunction with all relevant departments, local government, industry, natural resource management groups and conservation groups. This review concluded that improving conservation outcomes while reducing costs for government and industry could be achieved through a more strategic and integrated approach to offsets.

Key features of the new framework, introduced with the gazettal of the *Environmental Offsets Act 2014*, included:

- Strategic Offset Investment Corridors (SOICs), which identify some of the best places in the landscape for environmental offsets
- a record of landholders within the SOICs interested in having offsets on their land
- Direct Benefit Management Plans, which provide proponents with the flexibility to deliver offsets across multiple properties and in a more strategic and cost efficient way
- the option to meet an offset obligation by means of a financial payment to a secured offsets fund, managed by the Department of Environment and Heritage Protection (EHP) and used to deliver strategic outcomes with the assistance of an independent committee.

A single dataset is now available for all offsets approved since 1 July 2014 in the form of an offsets register, maintained by EHP and publicly available via the Queensland Government's website. This register includes information on all permits that have been granted with an offset condition, as well as specific details on financial payments, land based offsets and advanced offsets, all of which are updated on a quarterly basis.

Nature Conservation Act 1992

The *Nature Conservation Act 1992* (the Act) provides the legislative basis for the conservation of nature through the dedication, declaration and management of protected areas and the protection of native wildlife and its habitat.

As at 10 December 2015, there were 9,663,595ha of State land and Aboriginal freehold land included in 283 national parks, 21 national parks (Cape York Peninsula Aboriginal land) and 280 regional parks in Queensland. Dedication of these lands provides a high level of protection for species and the ecosystems upon which they rely within the 13 terrestrial bioregions in the state. Additionally, 4,000,582ha of nature refuges—which are protected areas declared over private land with landowner consent—further adds to the conservation protection of lands across the State. The Queensland Government has committed to a target of 17% of land in protected areas.

The Act provides the legislative framework to manage these areas so that their natural and cultural values are protected and conserved while recognising other compatible uses.

Similarly, outside of protected areas, the majority of native plants and animals are protected under the Act, so that they are managed under a legislative framework designed to promote the continuation of viable and sustainable populations in the wild.

Specific tools for managing protected areas, and for managing wildlife outside of protected areas, include park management plans and statements, regulatory notices, protected area permits and other authorities, licences and permits for the taking or use of wildlife, and individual conservation plans or recovery plans for species with particular needs.

Landscape Fragmentation Connectivity tool

The Landscape Fragmentation Connectivity tool performs a desktop assessment of development impacts on connectivity areas containing remnant vegetation. Connectivity areas are defined in Schedule 2 of the Environmental Offsets Regulation 2014.

The tool is effective as a test for significant residual impacts on connectivity, a prescribed environmental matter under the Environmental Offsets Framework. It is also effective as a mechanism for quantifying the fragmentation of remnant regional ecosystems at the bioregion scale.

A significant residual impact on connectivity by a prescribed activity is counterbalanced through the delivery of an offset in a non-remnant ecosystem. The outcome maintains overall ecosystem connectivity within the affected bioregion.

BioCondition

BioCondition is a biodiversity/vegetation condition assessment tool used to measure how well a terrestrial ecosystem is functioning for the maintenance of biodiversity values at a local or property scale. It is a site-based, quantitative and repeatable assessment procedure that either provides a numeric score that can be summarised as a condition rating of 1, 2, 3 or 4, or is described as functional through to dysfunctional condition for biodiversity.

Vegetation condition is referred to as "… how much the attributes of a patch of vegetation differ from the attributes of the same vegetation type in its reference state". The reference state refers to the natural variability in attributes of a regional ecosystem in 'best-on-offer' condition, or patches of vegetation that have been least impacted by local disturbances.

BioCondition is used for environmental offsets to determine condition of an offset proposal and its potential biodiversity value, as well as in the assessment of mining rehabilitation. Benchmark descriptions for each of the state's currently recognised 1,383 regional ecosystems are being compiled for the tool: 340 are so far available. While BioCondition is a proven tool for assessing condition at a site and extrapolated to an area, currently there is no established program for mapping condition of vegetation on a regional basis.

Protected Area Acquisition and Landscape Resilience Program

Successive Queensland governments have acquired, sometimes with the financial support of the Commonwealth, properties to add to Queensland's Protected Area Estate. For a variety of reasons, including pre-existing interests held over some of the lands, the dedication of these properties as protected areas can be delayed over several years.

Collaboration between James Cook University and EHP led to the implementation of the Landscape Resilience Program, an evidence-based protected areas acquisition strategy that incorporates the predicted effects of climate change on Queensland's biodiversity. Property prioritisation has been determined through a CAR (Comprehensive, Adequate, and Representative) approach, identifying those that will contribute the most to retaining underrepresented species in the current protected area system. Acquisitions are also targeted at securing or facilitating enhanced landscape connectivity.

This strategy will result in maximising biodiversity outcomes whilst moving towards the Queensland Government's target of 17% Protected Area Estate.

The 2014–15 target of 2% increase to protected areas was exceeded with a 5.3% increase achieved. The 2015–16 target of 8.1% of Queensland land area as Protected Area Estate is on track.

Nature Refuges Program and NatureAssist

The Nature Refuges Program forms part of the Queensland Government's commitment to 'Investing in our Environment for the Future'. Through the program, landholders voluntarily establish areas of land called nature refuges on their properties. While the nature refuges are legally binding, perpetual agreements with the State upholding conservation on those parcels, compatible and sustainable land uses can continue. The Queensland Trust for Nature, and the Scenic Rim and Sunshine Coast regional councils have partnered with EHP to service additional demand for nature refuges.

NatureAssist is a financial incentives program that targets specific properties that meet the Queensland Government's priorities for the Nature Refuges Program. Properties are selected for their significant conservation values, connectivity and their predicted resilience to a changing climate. Landholders of properties identified through this process are contacted directly by the Queensland Government to ask if they are interested in participating. NatureAssist staff work with landholders to achieve mutually agreed projects that formally protect significant conservation values on their land and enhance the resilience of the property. Participation is conditional on a nature refuge agreement being signed by the landholder and the Queensland Minister for Environment and Heritage Protection.

The 2013–14 target of a 2.8% increase was exceeded, with a 13.1% increase in nature refuges achieved. The 2014–15 target of 10% increase was not achieved: only a 2.7% increase was realised. The 2015–16 target of 8.1% of Queensland land area as Protected Area Estate is on track.

Indigenous Land and Sea Rangers

The Queensland Indigenous Land and Sea Ranger program increases Indigenous participation in environmental management. The Queensland Government, through EHP, funds 65 Indigenous land and sea rangers, employed through local Indigenous host organisations across 15 local communities. Most are traditional owners of the land on which they work.

Land and sea ranger activities include:

- weeds and feral animal management
- fire management
- biodiversity surveys on local species and habitats
- preserving cultural sites and stories
- supporting disaster recovery efforts
- visitor management and education
- helping manage national parks.

In 2015, Indigenous land and sea rangers:

- removed more than 130 ghost nets from North Queensland foreshores
- implemented measures to remove feral animals (predominantly pigs) in land covering more than 2,800,000ha
- conducted more than 280 environmental condition and biodiversity surveys, including marine turtle surveys
- undertook fire management of more than 900,000ha of land.

Strategic Fire Management Program

Fire is a natural phenomenon and wildfires can occur in parks and forests. Some fires have nature conservation benefits while others, particularly severe late season fires, can cause damage to property and the environment.

The Strategic Fire Management Program (SFMP) provides funding for enhanced and targeted fire management. The Department of National Parks, Sport and Racing is actively committed to bushfire mitigation and reducing risk to urban interfaces and rural communities across the 1,500 parcels of protected area estate and State forests it manages.

The successful implementation of a strategic planned burn program across the Queensland Parks and Wildlife Service estate reduces fuel loads and the subsequent intensity of any wildfires that may occur.

Between 2004 and 2015, the funding allocation for SFMP fluctuated between $714,000 and $1.4m per year. This is mirrored in the variance in number of annual planned burns—between 238 and 517—and the total area of the estate subjected to planned burning (between 247,000ha and 755,000ha annually).

Strategic Pest Management Program

Plant and animal pests cause significant adverse impacts in Queensland. The *Biosecurity Act 2014* places a responsibility on government agencies, including the Queensland Parks and Wildlife Service (QPWS), to manage pests on land and water bodies for which they have direct management responsibility.

The QPWS Strategic Pest Management Program (SPMP) provides funding for enhanced and targeted pest management. The allocation for SPMP has fluctuated between $1.015m and $1.964m per year since its inception in 2004, with the number of projects varying between 41 and 90 per year. These projects range from targeted campaigns in western Queensland involving baiting, shooting and trapping feral pigs, goats and horses, to large scale projects in north Queensland targeting highly invasive weeds.

Invasive pest species management

Where priority invasive pest species have become established and are no longer considered feasible to eradicate, the management focus changes from eradication to containment or asset protection.

Invasive pest management response—case study

War on Western Weeds—Prickly acacia and bellyache bush

War on Western Weeds (WoWW) aims to reduce the incidence and spread of prickly acacia and bellyache bush in western Queensland through improved weed management, research and training.

Prickly acacia and bellyache bush are two of Queensland's worst weeds because of their invasiveness, potential for spread, and economic and environmental impacts. Both are well-established throughout parts of western Queensland. These weeds can overtake pasture and natural grasslands, interfere with stock management and contribute to erosion. Bellyache bush is also toxic to humans and animals.

Effective prickly acacia management can only be achieved through collaborative partnerships between government, industry and community-based organisations such as natural resource management groups, who invest in research or management projects that align with local priorities. The WoWW program is an opportunity for graziers, local government, industry, and regional natural resource management groups to work in partnership with the Department of Agriculture and Fisheries to find better weed control solutions. Some of the key activities undertaken as part of the program include: trialling innovative weed management techniques; improving understanding of seed dispersal and longevity; identifying and testing new biological control agents; piloting "good neighbour" programs to measure the cost of removing prickly acacia along property boundaries to prevent weed spread; and promoting best-practice weed management through field days and forums.

Invasive pest species eradication

Pest eradication programs target the highest invasive species threats that are considered feasible to eradicate. For example, four tropical weeds and Red Imported Fire Ants are subject to national eradication programs.

Invasive pest eradication response—case study

Red Imported Fire Ants at the Port of Brisbane

Fire ants were discovered at the Port of Brisbane in February 2001. To prevent fire ants spreading, a restricted area was established at the site and movement controls put in place for items that could potentially carry fire ants.

The eradication program for the Port of Brisbane involved baiting the infested area (14,000ha) three to four times a year for three years. Bait was delivered either by hand, quad bikes or helicopters for larger treatment areas. The bait is carried by worker ants into the nest, leading to the queen becoming sterile and the colony dying out. A buffer area around the infested area also received surveillance over those three years.

Following three years of baiting, the treatment area received two rounds of surveillance over two years to confirm that the eradication was successful. The last nest was found in February 2005.

In 2010, all areas at the port were surveyed by fire ant odour detection dogs. Odour detection dogs can find fire ant nests in difficult terrain and can sniff out one solitary ant. They are more efficient than visual surveillance because their noses can find nests not apparent to the human eye. No Red Imported Fire Ant workers or nests were found. The Port of Brisbane was then considered to be free of Red Imported Fire Ants and movement controls for the area were lifted in December 2012.

Surveillance for fire ants is now undertaken by field officers and odour detection dogs on the ground and by helicopters using remote sensing technology (thermal, near-infrared and colour cameras) to capture imagery from the air.

Of the five known established incursions of Red Imported Fire Ant in Australia, two have been eradicated (the Port of Brisbane and Yarwun) and three are in the process of being eradicated. The eradication at the Port of Brisbane is the largest recorded for any ant species and demonstrates the technical feasibility of Red Imported Fire Ant eradication over large areas.

Status of key fish stocks

Nationally agreed assessment protocols record the status of key fish stocks in Queensland, assisting fishery managers to ensure that harvesting is at sustainable levels.

Key fish stocks program response—case study

King Threadfin—Gulf of Carpentaria stock

King Threadfin is a target species for both commercial and recreational fishers in Queensland. The species is distributed along the east coast of Queensland with a distinct genetic stock occurring in waters of the Gulf of Carpentaria.

The 2015 stock status assessment for Gulf of Carpentaria King Threadfin classified the stock as 'transitional depleting' according to nationally agreed criteria. This classification suggests numbers are declining with potential overfishing of the species without some type of management intervention. Given the uncertainty in existing catch data and the potential influence of environmental factors on recent catch rates for King Threadfin, a decision was taken to expand current monitoring and assessment programs for the species.

Detailed biological information is being collected in an ongoing program involving both commercial and recreational fishers. From 2016 onwards, King Threadfin will also be included in the national Status of Key Australian Fish Stocks report with assessment outcomes subject to independent peer review. This approach is consistent with an adaptive management framework and will ensure that future fishing effort for King Threadfin can be constrained to sustainable levels without imposing unnecessary or ineffective management measures.

Sustainable fishing policy

The Queensland Government's sustainable fishing policy highlights the need to maximise the overall community benefit from the state's limited fisheries resources. The policy recognises the complexity of current regulatory arrangements for fisheries and the need to obtain maximum value from fisheries resources on a sustainable basis. Key actions include adoption of a resource allocation policy based on maximising economic value, development of a charter fishing action plan and a review of the existing regulatory structure of commercial fisheries.

Water Quality Improvement Plans and Healthy Waters Management Plans

Water quality improvement plans (WQIPs) identify the most cost-effective and timely projects for investment by all parties including Australian, state and local governments, and community and environmental groups.

They seek to deliver significant reductions in discharge of pollutants to agreed 'hotspots' through identification of environmental values, water quality objectives and catchment-based management actions. They use an ecosystem-based approach to integrated water cycle management, supported by science.

The Environmental Protection (Water) Policy 2009, subordinate legislation under the *Environmental Protection Act 1994*, establishes healthy waters management plans (HWMPs) as key planning mechanisms to improve the quality of Queensland waters. HWMPs are similar to WQIPs as they identify environmental values, water quality objectives and catchment-based management actions through consultation and best available science.

HWMPs and WQIPs are broader than 'just water quality' as they protect aquatic ecosystems through specifying water quality objectives for indicators such as macroinvertebrates, fish and riparian/groundcover.

WQIPs undertaken in the Great Barrier Reef (GBR) catchments use the monitoring and evaluation tools generated by the Paddock to Reef Program. For example, GBR catchment water quality modelling and monitoring is used to prioritise areas for on-ground investment in management improvements and to predict water quality improvements from proposed management options.

The HWMP Guideline specifies that a HWMP should describe the proposed monitoring, reporting and evaluation program to enable the assessment of the short and longer term effectiveness of control actions and management measures, and whether contaminant loads and concentration reductions are being met. Monitoring, reporting and evaluation should be undertaken in accordance with the Queensland Integrated Waterways Monitoring Framework 2010 and the Monitoring and Sampling Manual 2009, both published by the Queensland Government. A collaborative partnership between the Queensland Government and a natural resource management group is the recommended approach for the delivery of a HWMP.

Queensland Regional Natural Resource Management Investment Program—2013 to 2018 and State Strategic Projects

The Queensland Government has allocated $80 million to the Regional Natural Resource Management Investment Program over five years from 2013 to 2018, including $30 million to protect the Great Barrier Reef.

The majority of the funding supports strategic projects delivered through Queensland's regional natural resource management bodies (regional NRM bodies). Largely community-based, these organisations provide an important link between governments and communities. They also work collaboratively with volunteer and grassroot organisations (e.g. Landcare), rural industry groups and landholders.

Funded projects implement on-ground activities that protect, improve and restore waterways and rangelands by addressing weeds and pests, and improving soil, vegetation and water quality at a river catchment or other landscape level. Funding is devolved by the regional NRM bodies to Landcare and like organisations.

This regional investment program also funds state strategic projects, distributing funding largely through Queensland Government agencies, to assist program administration and support.

In 2013, $31 million was allocated to 35 projects to be funded through regional NRM bodies to 2016. These projects included the NRM program commitments for the delivery of land and water management actions in key Great Barrier Reef catchments delivered through regional NRM bodies.

Eight projects were funded to improve water quality entering the Great Barrier Reef.

Funding of state strategic projects included:

- Queensland Water and Landcarers to assist with administrative costs and undertaking their advocacy role
- Rockhampton City Council for ex-Tropical Cyclone Marcia flood recovery activities
- AgForward to undertake coal seam gas and agricultural land workshops and field days
- South East Queensland Catchments for riparian restoration to mitigate erosion risk in several creek catchments in the greater Brisbane area.

The program is on track to achieve its targets.

The Annual Outlook 2014: Qld Regional Natural Resource Management Investment Program 2013–2018 reported:

- 303,609ha of pest plant control was undertaken representing about half of the target hectares. It noted that continued drought conditions may prevent achievement of the invasive plant control target of 3,000,000ha by the program's end. Invasive pest animal control was undertaken across 2,264,698ha, achieving twice the target area of control
- 176 land and water managers had applied best management practices across 382,787ha over the past 12 months, exceeding the target of 224,724ha
- 1,520ha of native riparian vegetation was protected, restored or enhanced along 221km of priority waterways, exceeding the target
- exclusion fencing was installed along 31km of waterways to protect riparian vegetation, exceeding the target of 12km
- 1,047ha of priority wetlands was protected or restored, exceeding the target
- 121 community groups were assisted to participate in natural resource management activities, and 5,653 people participated in 166 capacity building activities
- 193 partnerships were established with key stakeholders, and the target is on track to be achieved by the end of the program.

National Landcare Programme (Caring for our Country)

The National Landcare Programme (NLP) is the Australian Government's key natural resource management investment. The Australian Government's $1 billion investment includes support for Australia's 56 regional natural resource management organisations and complements funding for the Reef 2050 Plan.

The NLP's aims to achieve four strategic outcomes:

- maintain and improve ecosystem services through sustainable management of local and regional landscapesincrease the number of farmers and fishers adopting practices that improve the quality of the natural resource base, and the area of land over which those practices are applied
- increase engagement and participation of the community, including Landcare, farmers and Indigenous people, in sustainable natural resource management
- increase restoration and rehabilitation of the natural environment, including protecting and conserving nationally and internationally significant species, ecosystems, ecological communities, places and values.

This program was preceded by Caring for our Country (2008–2013) which provided more than $2 billion in funding and Natural Heritage Trust (1996–2008) which provided more than $3 billion.

Project proponents monitor and report through a monitoring, evaluation, reporting and improvement (MERI) approach which supports the collection of data and information to demonstrate achievements and allow ongoing improvements to be made at the project and program level.

The Australian Government aims to evaluate and report on the progress of NLP on a regular basis. A mid-term review of the NLP is underway and due mid–2016.

The Convention on Wetlands (Ramsar Convention)

The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Queensland has five Ramsar sites.

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) establishes a framework for managing Ramsar wetlands in Australia. Australian Ramsar management principles cover matters relevant to the preparation of Ramsar site management plans, including community consultation processes.

Primary responsibility for managing wetlands and their associated flora and fauna is vested in the appropriate landholders/land managers. Individual state and territory governments have the primary legislative and policy responsibility for natural resource management.

Regional Waterway Health Report Card Program

The Queensland Government committed $6 million over four years to support a number of regional waterway health report cards in the Great Barrier Reef including existing report card partnerships in Gladstone, Fitzroy and Mackay-Whitsundays, as well expanding to other areas such as the Wet Tropics, Burdekin and Burnett Mary. This is an action under the Reef 2050 Long-Term Sustainability Plan.

Regional waterway health report card—case study

Mackay–Whitsunday Pilot Report Card

The Mackay-Whitsunday Pilot Report Card, released in October 2015. reports on the health of the region's waterways, including the catchments of the Don, Proserpine, Pioneer, O'Connell and Plane basins, eight estuaries, and the inshore and offshore marine areas to the eastern boundary of the Great Barrier Reef. The report card helps community, industry, science, tourism and government to work together to determine how and where to do more to look after our waterways.

The agriculture stewardship assessments are adopted from the Great Barrier Reef Report Card. The Mackay-Whitsunday Pilot Report Card presents the proportion of the area of land for each sector under the current best management practice (defined as low or low-moderate risk to water quality); it does not show progress towards targets.

The percentage of land under best-practice management for sugarcane was 37% for pesticides, 20% for nutrients, and 41% for soil. The percentage of land under best-practice management for grazing was 16% hillslope, 38% stream bank, and 27% gullies. The percentage of land under best-practice management for horticulture was 10% pesticides, 47% nutrients, 64% soil, and 8% irrigation.

Stewardship reporting frameworks for other industries were designed to describe and evaluate environmental management efforts by industries and port operators to maintain or improve ecosystem health of the Great Barrier Reef.

Overall stewardship was rated on a scale from 'very effective' through to 'ineffective' based on administrative, operational and development activities during planning, implementation and outcome management phases. Legislative requirements were also considered in the frameworks.

The Mackay-Whitsunday Pilot Report Card rated management practices for heavy industry as 'effective', aquaculture as 'very effective', ports as 'effective', and tourism as 'effective'.

Investing in Our Environment for the Future (Healthy Catchments Program South East Queensland)

The Queensland Government's investment of $8 million over four years (2013–2017) delivers information and on-ground results to restore and rehabilitate South East Queensland's waterways.

The Healthy Catchments Program, led by EHP, aims to improve water quality and catchment health. It focuses on diffuse pollution sources from urban and rural areas and works in partnership with industry, independent organisations, local governments and other state government departments to deliver priority projects.

These projects cover a range of catchment management aspects from water quality monitoring and science, to further understand the interactions between land use and catchment health, to erosion and sediment control and stormwater management and the implementation of best management agricultural practices and restoration of riparian vegetation and bank stabilisation.

Monitoring and evaluation for the Healthy Catchments Program is built into individual projects. Healthy Waterways manages the Ecosystem Health Monitoring Program for South East Queensland which delivers an Ecosystem Health Report Card in October each year.

Marine Parks Act 2004

The *Marine Parks Act 2004* (the Act) provides for the conservation of Queensland's marine environment by implementing a comprehensive range of management strategies including the declaration of marine parks and the establishment of zones and designated areas, including highly protected areas within marine parks. These management arrangements are formalised through the gazettal of zoning plans and in some instances the development of management plans.

The Act aims to achieve a coordinated and integrated approach with other environmental conservation legislation, and recognises the cultural, economic, environmental and social relationships between marine parks and their adjacent lands and waters.

Australia's international responsibilities and intergovernmental agreements are important considerations in park management. Marine parks extend across areas adjacent to the Queensland coast which are under the control of both the Commonwealth and State governments. Both governments have agreed that, as far as practicable, in managing marine parks, state legislation will be consistent with the relevant Commonwealth legislation. This is critical in the Great Barrier Reef region where complementary measures support the management of this significant area.

Marine parks are multiple-use areas providing for a range of activities and visitor opportunities, for example fishing, tourism, education, research and some structures. The zoning plans prescribed under the Act spell out the types of uses and management measures.

Three marine parks have been declared under the Act with corresponding zoning plans established—Great Barrier Reef Coast Marine Park, Great Sandy Marine Park and the Moreton Bay Marine Park. Along with the Commonwealth Great Barrier Reef Marine Park, 99% of the east coast of Queensland currently sits within a marine park.

Each marine park has a zoning plan which is reviewed every 10 years to ensure that the management arrangements in place are the most appropriate to conserve the marine environment while allowing for sustainable use.

Fisheries Act 1994 (Fish Habitat Areas)

Queensland has 70 declared fish habitat areas (FHA) along its coast. These areas are declared under the *Fisheries Act 1994* and protect more than 1,100,000ha of high-quality fish habitat. This network provides long-term protection—essential for sustaining recreational, commercial and indigenous fisheries.

In 2013, the Central Queensland Fish Habitat Area Investigation Program began examining the feasibility of declaring two new FHAs and expanding an existing FHA.

Declared FHA Network Assessment Reports document the status of the declared FHA network every five years. The first report was published in 2012, with the second due in 2017. Assessment criteria are based on the aims of the Declared FHA Network Strategy.

Annual progress reports review and summarise the effectiveness of responses to recommended management actions.

Koala Nature Refuges Program and Koala habitat acquisition program

The Koala Nature Refuges Program provided targeted landholders with the opportunity to partner with the Queensland Government to restore and manage koala habitat on their land, through a funded project involving activities such as revegetation, pest management and fencing. Delivery of a Koala Nature Refuge project was conditional upon entering into a binding, perpetual nature refuge agreement to establish a nature refuge over all or part of the property, including the restored habitat. After completion of the project the landholder continues to manage the property and the restored area to maximise koala habitat outcomes.

Community infrastructure offset payments made by Queensland Government entities were invested in land acquisition programs aimed at protecting and rehabilitating koala bushland. The initial focus shifted from purchasing land that could be rehabiliatated in the state's south-east to acquiring existing high-value koala habitat both within and beyond South East Queensland, especially land that would consolidate existing protected area management boundaries and minimise overall management costs. Once koala habitat was well established, properties were transferred to a suitable land manager to allow for long-term rotection of the koala habitat.

The 2013–14 target of a 10% gain in the total amount of land secured for rehabilitation as new koala habitat was exceeded with a 111.4% increase.

The 2014–15 target was a 12.5% increase. This program has now ceased.

3.0 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.

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

3.1 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 and Torres Strait Islander cultural heritage is important

Aboriginal and Torres Strait Islander cultural heritage can be both tangible and intangible. It intrinsically links people to place and enables cultural connections with country.

There are many different types of Aboriginal and Torres Strait Islander sites and places throughout Queensland and numerous ways of describing them. Efforts to protect, conserve and interpret Aboriginal and Torres Strait Islander cultural heritage are important in preserving and respecting the cultural values of a place or object.

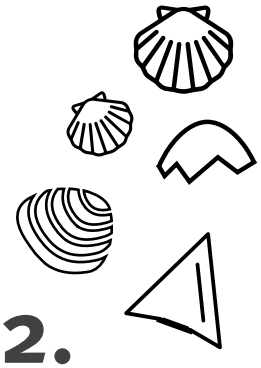
Pressures

There is decreasing pressure on cultural heritage from major resource and infrastructure projects, but there is consistent pressure from general land use activities.

Key findings | Aboriginal and Torres Strait Islander

CULTURAL HERITAGE

More than 10,000 new site locations were recorded on the **cultural heritage database since 2012.**



(As at 30 june 2015, there were 42,537 site locations on the register.)

Between **2012–15**

105

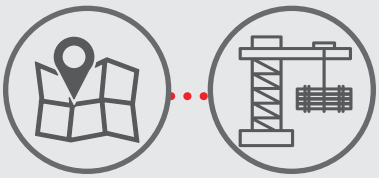
cultural heritage management plans

were approved and registered.

PRESSURES

There is **decreasing pressure** on **cultural heritage** from **major resource** and **infrastructure projects.**

There is **consistent pressure**



from **general land use activities.**


Q A T B
1900
AMBULANCE

3.2 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.

Key findings | Historic

Between **2012–15** the following **changes** were made to the **Queensland Heritage Register:**

✓ **66** **places** were **entered.**

0 **State Heritage** Places were **destroyed.**

✕ **5** **places destroyed prior** to **2012** were **removed.**

Since 2012, the **Australian National Shipwreck Database** was **updated** to include:

1,112 **shipwreck entries**

50 **aircraft entries.**

Of the **77** **local governments** in Queensland, **57** **identify local heritage places** in their planning schemes **(as of December 2015).**

OPEN HOUSE EVENTS

BNE OPEN HOUSE

Queensland's Open House events encourage the community to explore a region's significant buildings and history.
In 2015, the event attracted **85,754 visitors**.

65,918 **Brisbane** Open House

11,526 **Maryborough** Open House

5,310 **Toowoomba** Open House

3,000 **Gold Coast** Open House.

3.3 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; 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—crown-of-thorns starfish, climate change, coastal development, land-based run-off, and direct use.
- Wet Tropics of Queensland—invasive species, and climate change.
- Fraser Island—increased tourism, climate change, and invasive species
- Gondwana Rainforests of Australia—climate change, and invasive species.

Key findings | World

QUEENSLAND'S WORLD HERITAGE AREAS

1. Great Barrier Reef | 2. Wet Tropics of QLD | 3. Riversleigh | 4. Fraser Island | 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.

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.

Management responses related to heritage include:

3.4.1 Aboriginal and Torres Strait Islander

Aboriginal and Torres Strait Islander cultural heritage legislation

The *Aboriginal Cultural Heritage Act 2003* and the Torres Strait Islander Cultural Heritage Act 2003 provide effective recognition, protection and conservation of Aboriginal and Torres Strait Islander cultural heritage, defined as anything that is:

- a significant Aboriginal or Torres Strait Islander area or object in Queensland; or
- evidence, of archaeological or historic significance, of Aboriginal or Torres Strait Islander occupation of an area of Queensland.

An area or object is significant because of either or both of the following:

- Aboriginal or Torres Strait Islander tradition
- history including contemporary history of any Aboriginal or Torres Strait Islander party for the area.

The Acts:

- provide blanket protection of areas and objects of traditional, customary, and archaeological significance
- recognise the key role of traditional owners in cultural heritage matters
- establish practical and flexible processes for dealing with cultural heritage in a timely manner.

Aboriginal and Torres Strait Islander cultural heritage database and cultural heritage register

The purpose of the cultural heritage database is to assemble information in a central and accessible location, to be used as a research and planning tool to assist with the assessment of cultural heritage values of particular areas. The database is not publicly accessible.

The cultural heritage register, which is available to the public, holds information regarding:

- cultural heritage studies
- Designated Landscape Areas
- whether a particular area has been the subject of a cultural heritage management plan
- cultural heritage bodies
- details of statutory Aboriginal and Torres Strait Islander parties.

The register also contains information used for land-use planning. It is used as a research and planning tool to assist with the assessment of cultural heritage values of particular objects and areas.

Cultural Heritage Management Plans

A cultural heritage management plan (CHMP) is an agreement between a land user and Traditional Owners, developed under Part 7 of the Acts, that explains how land use activities can be managed to avoid or minimise harm to Aboriginal or Torres Strait Islander cultural heritage.

While a CHMP must be developed and approved under Part 7 of the legislation when an environmental impact statement is required for a project, any land user can voluntarily develop and seek to have a CHMP approved.

A statutory one-month notification of an intention to develop a CHMP is followed by a three-month negotiation and consultation period with the Aboriginal or Torres Strait Islander party regarding the terms of the plan.

3.4.2 Historic

Queensland Heritage Act 1992

The *Queensland Heritage Act 1992* is the primary legislation by which Queensland's historic heritage places are identified and protected, creating an environment for growing recognition of heritage by local government. The Act is administered by the Department of Environment and Heritage Protection and the Queensland Heritage Council, an independent statutory body. The Heritage Council has sole responsibility for deciding which places are entered in, or removed from, the state's Heritage Register.

Amendments to the *Queensland Heritage Act 1992* commenced in September 2015, along with a new Heritage Regulation. The changes focused on reducing regulatory burden while strengthening protections for Queensland's heritage places, emphasising the important role played by local government in heritage protection and reinforcing the strategic role of the Queensland Heritage Council. The amendments were the subject of public consultation through release of Our heritage: A collaborative effort. Discussion paper – Review of the *Queensland Heritage Act 1992*.

Subsequently, Heritage Register processes were streamlined. Excluded place provisions replaced the out-dated Certificate of Immunity provisions; the scope of Exemption Certificates was expanded to reduce the regulatory burden for owners when they undertake low-impact work on a heritage place; Essential Repair and Maintenance provisions were strengthened to better target wilful neglect; and the orders available to the court in penalising those convicted of certain offences under the Heritage Act were expanded. A requirement was also introduced requiring underwater cultural heritage artefacts (including ship and aircraft wrecks lost in Queensland waters, rivers and bays for at least 75 years) to be reported and protecting these discoveries from interference without consent.

Local governments' vital role in protecting local heritage places was emphasised and updated along with Exemption Certificate, Essential Repair and Maintenance and Heritage Agreement powers for local heritage places.

Queensland Heritage Register

The Queensland Heritage Register is the primary instrument by which places of heritage value to Queensland as a whole are identified and protected. The Department of Environment and Heritage Protection manages the details about places in the Queensland Heritage Register, but the Queensland Heritage Council makes decisions about which places are entered in or removed from it, and when substantial changes are made to those entry documents.

Amendments to the *Queensland Heritage Act 1992* commenced in 2015. Queensland Heritage Register processes were streamlined and aligned with Certificate of Immunity provisions; the process of updating entry details was rationalised to allow for greater currency of information; and a higher standard of application information will be required so that only well-researched and evidenced applications are progressed.

Monitoring of historic shipwreck sites

Monitoring of historic shipwreck sites is undertaken periodically, after severe weather events, and in response to notifications made by members of the public.

EHP recently prepared a condition report form that must be completed by applicants for permits to enter protected zones. This form can also be used to provide information on any historic shipwreck site. Accompanying guides for seven popular historic shipwrecks, and for visiting historic shipwrecks generally, have also been prepared.

Information obtained from monitoring activities is used to update the Australian National Shipwreck Database and the Living Heritage Information System.

Monitoring helps keep sites open and enables risks to be addressed. This supports commercial and recreational divers to responsibly engage with the state's underwater heritage.

Historic shipwreck survey

Of the estimated 1,100 historic shipwrecks along the Queensland coastline, only 13% have been properly documented with an exact location and description of the site. Through a combination of survey work, historical research, and information from the public, the number of properly documented historic shipwrecks is increasing.

Historic shipwreck entries in the Australian National Shipwreck Database are updated with an exact location and site description. Accurate identification of historic shipwrecks allows appropriate management and protection of these wrecks for current and future generations.

Open House visitation data collation

Open House visitation data is used to guide and improve future events.

Starting in London in 1992, the Open House movement showcases outstanding architecture and encourages people to explore and understand the value of a well-designed built environment.

Following the lead of Melbourne in 2008, Open Houses started in Brisbane in 2010 extending to Maryborough (2012), Toowoomba (2013), and Gold Coast (2015).

Visitation numbers are used to:

- maintain current sponsorship commitments and to secure new sponsors
- encourage other regional centres to become involved in the Open House movement
- develop and refine programs at future events
- allocate volunteer resources more efficiently.

3.4.3 World Heritage

World Heritage List

The World Heritage List comprises natural and cultural places of 'outstanding universal value' selected by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Committee.

The Committee is responsible for implementing the World Heritage Convention, defining the use of the World Heritage Fund and allocating financial assistance, deciding whether a property is inscribed on the World Heritage List, examining reports on the state of conservation of inscribed properties, and asking for action to be taken when properties are not being properly managed. It also decides on the inscription or deletion of properties on the List of World Heritage in Danger.

Once a property is inscribed on the World Heritage List, effective and active measures must be taken for its protection, conservation and presentation.

Every six years a periodic report on the application of the World Heritage Convention, and the state of conservation of World Heritage properties, is invited to be submitted to the World Heritage Committee.

IUCN World Heritage Outlook

The International Union for Conservation of Nature (IUCN) is the world's oldest and largest global environmental organisation. It was instrumental in the founding of the World Heritage Convention in 1972. The IUCN World Heritage Outlook is the first independent global assessment of all natural World Heritage sites and the action needed to achieve excellence in their conservation.

IUCN has developed a standardised methodology for the Conservation Outlook Assessments of natural World Heritage sites.

The assessments are based on the best-available information, and do not replace existing site-based monitoring and evaluation systems of the World Heritage Convention.

Assessments are coordinated by the IUCN Secretariat working with a team of site assessors who are familiar with the sites and supported by consultation.


UENTIN HI
LINE ANZAC
D ROMANI

4.0 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 cause harm to our native species and their habitat and impact on the scenic amenity of Queensland's natural areas.

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

4.1 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.

Historical lead levels throughout Queensland declined dramatically from the 1980s as the lead content in petrol was reduced, and eventually phased out in 2002.

Even in the limited areas where lead is still a concern (Mount Isa and Townsville), levels measured show compliance with the national standard and are considerably lower than levels of lead measured in Brisbane during the 1980s.

Pressures

Air pollutant emissions for industrial sources in Queensland have generally been trending upwards for the past five 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 and driving behaviour.

Key findings | Air quality

AIR QUALITY

Air quality

has **improved significantly** 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 **significantly reduced.**

Sulphur dioxide

has **exceeded** the **standard** on a number of occasions in

Mount Isa.

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

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

During 2012–15, the majority of the

air toxics (pollutants)

measured at one location in **Brisbane,** and one in **Gladstone** — were at levels **below** the **national air quality investigation levels.**

VEHICLES

Registered motor vehicles (cars, truck, buses) 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

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

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

4.2 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. The Queensland Government has committed to supporting a number of regional waterway health report cards in the Great Barrier Reef, including existing Gladstone, Fitzroy and MackayWhitsundays report card partnerships, and expanding into other areas including Wet Tropics, Burdekin and Burnett Mary. The Healthy Waterways Report Card reports on South East Queensland.

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. Climate change is another pressure, particularly the Great Barrier Reef.

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.

Key findings | Water quality

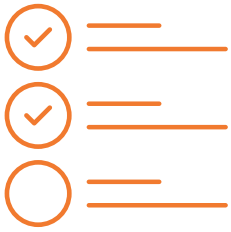
UNDERSTANDING WATER QUALITY REPORT CARDS

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 2015 SEQ report card **Moreton Bay** zones were found to be in good or **excellent condition.** ✓

The overall grade in the 2015 **Gladstone harbour** report card remained as **satisfactory.**



Mackay-Whitsunday 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 2013-14 **Fitzroy Basin** report card overall condition grade changed from **fair to good.**

In the **Condamine Catchment** report card overall condition grade was **good.**

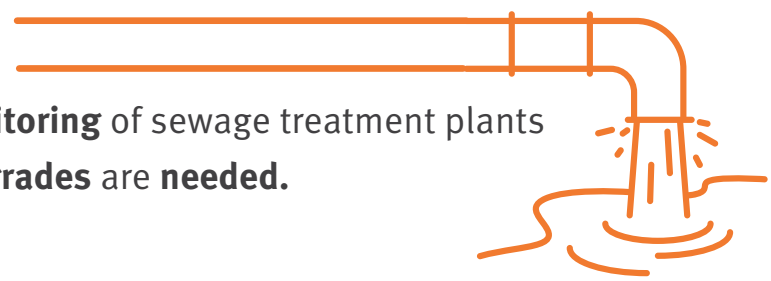
PRESSURES

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. Continuous monitoring** of sewage treatment plants is undertaken to **determine** when **upgrades** are **needed.**




375 ml
real

4.3 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.

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

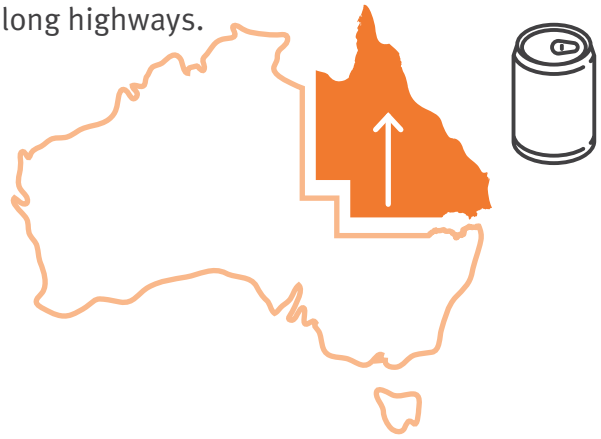
Queensland disposes of millions of tonnes of general waste per year. In recent years, the amount of waste sent to landfill in Queensland has been boosted by waste from interstate sources. It is likely that the relatively low costs of landfill disposal in Queensland have been the motivator for this cross-border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

Littering and illegal dumping causes serious environmental impacts, with reports suggesting that the problem is widespread throughout the state. Recent surveys indicate that approximately 25% of the population admits to littering and approximately 10% admits to illegal dumping.

Key findings | Waste

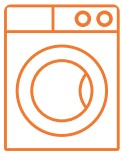
IMPACT OF LITTER AND ILLEGAL DUMPING

The average number of **litter items** is **higher in Queensland** than **other Australian states**, particularly in shopping centres, retail areas and along highways.



The **most prevalent type of litter** is **cigarette butts** although this **makes up** only a **very small fraction** of the **total volume of litter**.

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**.

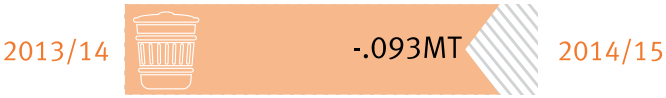
Collecting and properly disposing of illegally dumped materials imposes substantial costs, particularly on local governments.

WASTE LANDFILLED

1.21 million tonnes (MT) of **domestic kerbside waste** was sent to **landfill** in **2014–15**

a **decrease** from **1.28 million tonnes** in **2012–13**.

1.493 million tonnes (MT) of **construction and demolition waste** was sent to **landfill** in **2014–15**



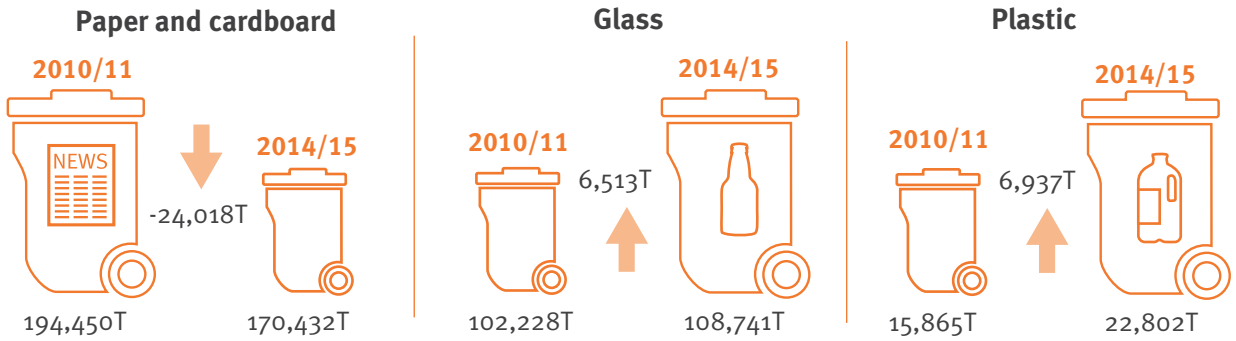
a **reduction** of **93,000 tonnes** from **2013–14** (but 644,000 tonnes higher than in 2011–12).

1.518 million tonnes of **commercial and industrial waste** was sent to landfill in **2014–15**

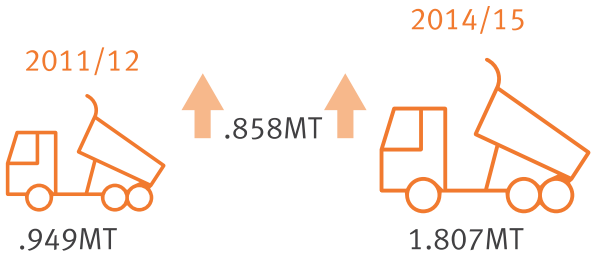
—similar to amounts reported in previous years.

WASTE RECOVERED OR RECYCLED

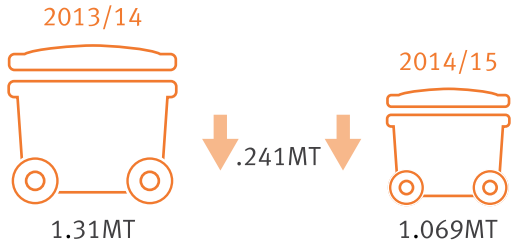
Household waste sent for recycling



Construction and demolition waste recovered

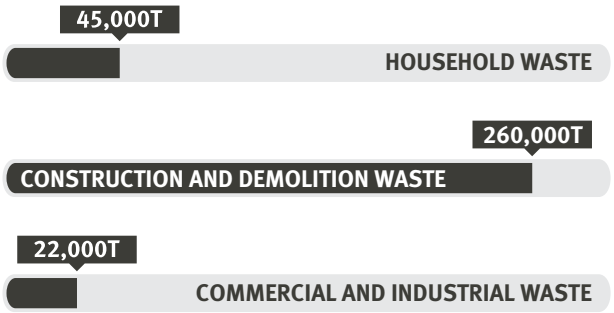


Commercial and industrial waste recovered or recycled



INTERSTATE WASTE RECEIVED

In **2014–15**, the following **wastes generated interstate** were **transported** to **Queensland landfills** for disposal:



Trackable waste received from interstate **increased** from about **13,000T** in **2011–12** to about **33,600T** in **2014–15**

4.4 Greenhouse gas emissions

A greenhouse gas is a gas that traps heat in the atmosphere. By increasing the heat in the atmosphere, greenhouse gases are responsible for the greenhouse effect, which leads to global warming and climate change.

Human activities have increased greenhouse gases in the atmosphere. Activities such as burning fossil fuels for electricity, heat and transportation are a significant source 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

Between 2005 and 2014, Queensland greenhouse gas emissions data showed:

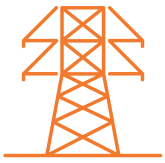
Decrease

18%

greenhouse gas

In 2014, Queensland was the largest source of emissions compared to other Australian jurisdictions.

1%



stationary energy sector
(44% of total emissions)

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

69%

land sector
(13% of total emissions)

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

Increase

38%

total fugitive emissions
(9% of total emissions)

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

15%

waste sector
(2% of total emissions)

However waste emissions have fallen since 2011 due to increased capture and combustion of landfill gas.

18%

transport sector
(14% of total emissions)

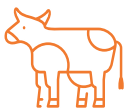
Road transport including passenger cars were the main source of emissions.

11%

industrial processes sector
(4% of total emissions)

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

6%



agriculture sector
(14% of total emissions)

This is mainly due to increased livestock numbers.


QUAY CENTRAL
SUNCORP

4.5 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.

Management responses related to pollution include:

4.5.1 Air quality

National Environment Protection (Ambient Air Quality) Measure 1998

Transport and industrial activities are the main sources of air pollutants in Queensland although rural and domestic activities also play a role.

The National Environment Protection (Ambient Air Quality) Measure 1998 establishes national goals for sulphur dioxide, nitrogen dioxide, ozone, carbon monoxide, particles and lead.

Australian Design Rules (ADRs), under the Commonwealth *Motor Vehicle Standards Act 1989*, set emission standards for new vehicles. Ongoing tightening of ADRs over the past 20 years has resulted in significant reductions in emissions of lead, carbon monoxide, nitrogen oxides, hydrocarbons and particles.

The Commonwealth *Fuel Quality Standards Act 2000* sets national quality standards for a wide range of fuel quality properties to reduce emissions or improve engine performance.

National Environment Protection Measure standards

The National Environment Protection Measure for Ambient Air Quality (Air NEPM) requires annual reporting of Queensland's air quality against the Air NEPM standards.

The requirement applies to 15 stations across the state and focuses on normal population exposure (for example, stations that are not close to industrial areas or major roads).

Ambient air quality monitoring at AAQ NEPM sites in Queensland between January and December 2014 showed no exceedances of the AAQ NEPM air quality standards for carbon monoxide, nitrogen dioxide, ozone and lead at any monitoring location.

Exceedances of the AAQ NEPM standards occurred for:

- one-hour average sulphur dioxide at the Menzies and The Gap monitoring sites in Mount Isa due to industrial emissions
- 24-hour average sulphur dioxide emissions at the Menzies monitoring site in Mount Isa due to industrial emissions
- 24-hour average PM10 (particles less than 10 micrometres in diameter) at the Mountain Creek monitoring site in South East Queensland due to smoke from a bushfire, and at The Gap site in Mount Isa due to windblown dust.
- 24-hour average PM2.5 (particles less than 2.5 micrometres in diameter) advisory reporting standard at the South Gladstone monitoring site due to bushfire smoke.

The AAQ NEPM goals were met in all regions with the exception of:

- one-hour average sulphur dioxide at the Menzies and The Gap sites in Mount Isa due to industrial emissions.

Compliance with the AAQ NEPM standards and goals could not be demonstrated for sulphur dioxide at the Stuart monitoring site in Townsville or for lead at The Gap monitoring site in Mount Isa because data availability was below the level required to make a valid assessment due to instrument failure.

Environmental Protection Act 1994

The Environmental Protection Act 1994 and the Environmental Protection Regulations 2008 establish a list of industrial activities (called environmentally-relevant activities—ERAs) that must have a current development approval or environmental authority.

The Environmental Protection (Air) Policy 2008 (Air EPP) establishes long-term objectives for sulphur dioxide, nitrogen dioxide, ozone, carbon monoxide, particles, lead and a number of air toxics.

Euro 5 emission standards

Australia has had road vehicle emission standards for new vehicles in place since the early 1970s.

Australian Design Rules (ADRs), under the Commonwealth *Motor Vehicle Standards Act 1989*, set emission standards for new vehicles. In November 2013, the first stage of the introduction of the Euro 5 emission standards commenced for light vehicles, which includes cars and light commercial vehicles.

It is generally accepted that the increasing proportion of vehicles meeting tighter emission standards has played a major part in improvements in a number of air quality indicators over the past 10 years.

ADRs are performance standards which specify the maximum levels of emissions permitted under a specified test, and do not mandate the use of particular technology.

National Clean Air Agreement

In December 2015, Australia's environment ministers established the National Clean Air Agreement. The agreement seeks to ensure that the community continues to enjoy clean air and address the impacts on human health and the environment.

The agreement focuses on actions to reduce air pollution and improve air quality through cooperative action between industry and government at the national, state and local levels. The agreement is designed to incorporate a range of existing, new and complementary measures to improve Australia's air quality.

Under the agreement, emission standards for new non-road spark ignition engines will be introduced through Commonwealth legislation in 2016. State and territory governments are working towards adopting standards for new wood heaters and particles. Particle pollution is the most significant air quality issue in Queensland: particles are emitted into the atmosphere from a variety of sources including motor vehicles and industrial activities, as well as climatic conditions, agricultural burning and hazard-reduction burning.

Moving freight

Queensland's freight task is rising rapidly, and is forecast to increase by 89% from 871 million tonnes in 2010–11 to between 1,643–1,741 million tonnes by 2026.

The Department of Transport and Main Roads is planning for this growing challenge with Moving Freight, a 10-year strategy which identifies 38 actions to improve freight movement in Queensland. This includes more freight on rail, supporting the agricultural sector and improving the efficiency of the road freight task.

4.5.2 Water quality

Water Quality Improvement Plans and Healthy Waters Management Plans

Water quality improvement plans (WQIPs) identify the most cost-effective and timely projects for investment by all parties including Australian, state and local governments, and community and environmental groups.

They seek to deliver significant reductions in discharge of pollutants to agreed 'hotspots' through identification of environmental values, water quality objectives and catchment based management actions. They use an ecosystem based approach to integrated water cycle management, supported by science.

The Environmental Protection (Water) Policy 2009, subordinate legislation under the *Environmental Protection Act 1994*, establishes healthy waters management plans (HWMPs) as a key planning mechanism to improve the quality of Queensland waters. HWMPs are similar to WQIPs as they identify environmental values, water quality objectives and catchment based management actions through consultation and best available science.

HWMPs and WQIPs are broader than 'just water quality' as they protect aquatic ecosystems through specifying water quality objectives for indicators such as macroinvertebrates, fish and riparian/groundcover.

WQIPs undertaken in the Great Barrier Reef (GBR) catchments use the monitoring and evaluation tools generated by the Paddock to Reef Program. For example, GBR catchment water quality modelling and monitoring is used to prioritise areas for on-ground investment in management improvements and to predict water quality improvements from proposed management options.

The HWMP Guideline specifies that a HWMP should describe the proposed monitoring, reporting and evaluation program to enable the assessment of the short and longer term effectiveness of control actions and management measures, and whether contaminant loads and concentration reductions are being met. Monitoring, reporting and evaluation should be undertaken in accordance with the Queensland Integrated Waterways Monitoring Framework 2010 and the Monitoring and Sampling Manual 2009, both published by the Queensland Government. A collaborative partnership between the Queensland Government and a natural resource management group is the recommended approach for the delivery of a HWMP.

Queensland Regional Natural Resource Management Investment Program—2013 to 2018 and State Strategic Projects

The Queensland Government allocated $80 million to the Regional Natural Resource Management Investment Program over five years from 2013 to 2018. This includes $30 million to protect the Great Barrier Reef.

The majority of the funding supports strategic projects delivered through Queensland's regional natural resource management bodies (regional NRM bodies). Largely community-based, these organisations provide an important link between governments and communities. They also work collaboratively with volunteer and grassroot organisations such as Landcare, rural industry groups and landholders.

Funded projects implement on-ground activities that protect, improve and restore waterways and rangelands by addressing weeds and pests, and improving soil, vegetation and water quality at a river catchment or other landscape level. Funding is devolved by the regional NRM bodies to Landcare and like organisations.

State strategic projects are also funded, distributed through Queensland Government agencies to assist program administration and provide necessary support over five years from 2013 to 2018.

In 2013, $31 million was allocated to 35 projects to be funded through regional NRM bodies to 2016. These projects include the NRM program commitments for the delivery of land and water management actions in key Great Barrier Reef catchments delivered through regional NRM bodies.

Eight projects have been funded to improve water quality entering the Great Barrier Reef.

Other state strategic projects include:

- funding to Queensland Water and Landcarers to assist with administrative costs and undertaking their advocacy role
- additional funding through South East Queensland Catchments allocated for riparian restoration to mitigate erosion risk in several creek catchments in the greater Brisbane area.

The program is on track to achieve its targets.

The Annual Outlook 2014: Qld Regional Natural Resource Management Investment Program 2013–2018 reported that:

- 303,609ha of pest plant control was undertaken representing about half of the target hectares. It noted that continued drought conditions may prevent achievement of the invasive plant control target of 3,000,000hainvasive pest animal control was undertaken across 2,264,698ha, achieving twice the target area of control
- 176 land and water managers had applied best management practices across 382,787ha over the past 12 months, exceeding the target of 224,724ha
- 1,520ha of native riparian vegetation was protected, restored or enhanced along 221kms of priority waterways, exceeding the target
- exclusion fencing was installed along 31kms of waterways to protect riparian vegetation, exceeding the target of 12kms
- 1,047ha of priority wetlands were protected or restored, exceeding the target
- 121 community groups were assisted to participate in natural resource management activities, and 5,653 people participated in 166 capacity building activities
- 193 partnerships had been established with key stakeholders. The target was on track to be achieved by the end of the program.

National Landcare Programme (Caring for our Country)

The National Landcare Programme (NLP) is the Australian Government's key natural resource management investment. The $1 billion investment includes support for Australia's 56 regional natural resource management organisations and complements funding for the Reef 2050 Plan.

The NLP aims to achieve four strategic outcomes:

- maintain and improve ecosystem services through sustainable management of local and regional landscapes
- increase in the number of farmers and fishers adopting practices that improve the quality of the natural resource base, and the area of land over which those practices are applied
- increase engagement and participation of the community, including Landcare, farmers and Indigenous people, in sustainable natural resource management
- increase restoration and rehabilitation of the natural environment, including protecting and conserving nationally and internationally significant species, ecosystems, ecological communities, places and values.

The program was preceded by Caring for our Country (2008-2013) which provided more than $2 billion in funding and Natural Heritage Trust (1996–2008) which provided more than $3 billion.

Project proponents use a monitoring, evaluation, reporting and improvement (MERI) approach which supports the collection of data and information to demonstrate achievements and allow ongoing improvements to be made at the project and program level.

The Australian Government aims to evaluate and report on the progress of NLP on a regular basis. A mid-term review of the NLP is underway and due mid-2016.

Investing in Our Environment for the Future (Healthy Catchments Program South East Queensland)

The Queensland Government's investment of $8 million over four years (2013–17) delivers information and on-ground results to restore and rehabilitate South East Queensland's waterways.

The Healthy Catchments Program, led by EHP, aims to improve water quality and catchment health.

The program focuses on diffuse pollution sources from urban and rural areas and works in partnership with industry, independent organisations, local governments and other state government departments to deliver priority projects.

These projects cover a range of catchment management aspects, from water quality monitoring and science to further understand the interactions between land use and catchment health, to erosion and sediment control and stormwater management and the implementation of best management agricultural practices and restoration of riparian vegetation and bank stabilisation.

Monitoring and evaluation for the Healthy Catchments Program is built into individual projects.

Healthy Waterways manages the Ecosystem Health Monitoring Program for South East Queensland which delivers an Ecosystem Health Report Card in October each year.

Regional Waterway Health Report Card Program

The Government has committed $6 million over four years to support a number of regional waterway health report cards in the Great Barrier Reef. This includes existing report card partnerships in Gladstone, Fitzroy and Mackay Whitsundays as well as expansion to other areas such as the Wet Tropics, Burdekin and Burnett-Mary. This is an action under the Reef 2050 Long-Term Sustainability Plan.

Regional waterway health report card—case study

Gladstone Harbour Report Card 2015

The Gladstone Harbour Report Card reports on estuarine and marine condition in the harbour based on monitoring of ecological and biological indicators; it reports on social, economic and cultural indicators. The report card helps enable stakeholders to have confidence in the efforts to maintain and improve the health of the harbour.

Gladstone Healthy Harbour Partnership commissioned consultants, Eco Logical Australia Pty Ltd, to develop a stewardship reporting framework for ports and industry (including major industry and fishing). The stewardship reporting framework is designed to describe management efforts within the Gladstone Harbour area. The results of the stewardship reporting framework are:

- PORT: Overall, port stewardship in Gladstone Harbour was rated as effective for the 2014-15 financial years. This was consistent across each of the management themes, with administration, operations, development and shipping achieving effective stewardship ratings.
- INDUSTRY: Overall, industry stewardship in Gladstone Harbour was rated as effective. This was consistent across each of the management themes, with administration, operations and development achieving effective stewardship ratings.
- FISHING: The overall ratings for fishing stewardship in Gladstone Harbour for the 2014 calendar year were: Recreational – fully effective; Commercial – effective. This was based on fishing and vessel compliance data provided by the Queensland Department of Agriculture and Fisheries from their boating and fishing patrols and inspections.

For Great Barrier Reef management responses, see section 1.

4.5.3 Waste

Waste Reduction and Recycling Act 2011

The *Waste Reduction and Recycling Act 2011* contains a suite of measures to reduce waste generation and landfill disposal and encourage recycling.

It aims to modernise waste management and resource recovery practices in Queensland, promote waste avoidance and reduction, and encourage resource recovery and efficiency.

In addition, the legislation also provides a regulatory framework for enforcing compliance action against littering and illegal dumping incidences in Queensland—regardless of land tenure or property ownership—and third party reporting of littering and illegal dumping.

Waste Strategy

This industry-led approach has fostered a strong focus on shared responsibility for improving Queensland's waste performance.

The strategy is underpinned by a set of principles and the waste and resource management hierarchy, which sets out an order of preference for options for managing waste—from avoiding, to reducing, reusing, recovering and disposing of waste.

The targets set in the Waste Strategy are projected forward 10 years and can be assessed each year against the findings in the State of Waste and Recycling in Queensland report.

State of Waste and Recycling in Queensland report

The State of Waste and Recycling in Queensland report includes information gathered each year through the Queensland Waste Data System annual survey.

The reported results and findings are exclusive to the year the data is collected.

Queensland's Litter and Illegal Dumping Action Plan

Queensland's Litter and Illegal Dumping Action Plan, released in October 2013, outlines the key actions undertaken by the state government in managing this problem. It is an integrated plan that focuses on a suite of actions to positively influence community attitudes and behaviours to encourage the appropriate disposal of waste.

Litter and Illegal Dumping Online Reporting System

The Litter and Illegal Dumping Online Reporting System enables the public to report online, or via a smart phone or tablet, incidents of littering and illegal dumping from a vehicle or vessel.

4.5.4 Greenhouse gas emissions

Emissions Reduction Fund

The Emissions Reduction Fund (ERF) provides incentives for emissions reduction activities across the Australian economy. The ERF operates alongside existing programs that are already working to reduce Australia's emissions growth such as the Renewable Energy Target and energy efficiency standards on appliances, equipment and buildings. The Australian Government has provided $2.55 billion to establish the ERF.

The ERF offers a range of opportunities for businesses, local councils, state governments and land managers to reduce their greenhouse gas emissions associated with agriculture, energy, waste, transport and industrial processes. As of April 2016, more than 550 ERF projects were registered with the Clean Energy Regulator.

Large-scale Renewable Energy Target and the Small-scale Renewable Energy Scheme

The Large-scale Renewable Energy Target (LRET) creates a financial incentive for the establishment or expansion of renewable energy power stations, such as wind and solar farms or hydro-electric power stations.

The Small-scale Renewable Energy Scheme (SRES) creates a financial incentive for households, small businesses and community groups to install eligible small-scale renewable energy systems such as solar water heaters, heat pumps, solar photovoltaic (PV) systems, small-scale wind systems, or small-scale hydro systems.

The Climate Change Authority released its second review of the Renewable Energy Target on 22 December 2014. It found that the LRET was effective in reducing emissions at reasonable cost in the electricity sector and can be relied upon to deliver sizeable volumes of emissions reductions.

One million solar rooftops target

The Queensland Government has set a target of one million rooftops—or 3000 megawatts of solar photovoltaics (PV)—in Queensland by 2020.

The solar target will help Queensland grow solar PV on businesses, community buildings and even large commercial or industrial sites.

Renewable Energy Study

The Queensland Government Renewable Energy Study will investigate the development of a renewable energy economy in Queensland.

An independent renewable energy expert panel will assist this process and will consider a credible pathway to achieving 50% renewable energy target by 2030.

Solar 60

The Queensland Government's Solar 60 initiative will support up to 60 megawatts of solar generation to encourage large-scale solar generation and investment in Queensland.

In collaboration with the Australian Renewable Energy Agency, Solar 60 will help support the development of local, large-scale solar projects. This will provide a long-term revenue contract to successful Queensland bidders.

Queensland climate change strategies

The Queensland Government has committed to play its part in the global effort to limit warming to well below 2 degrees.

To ensure the long-term viability of Queensland's economy, communities and industries, the government will develop and implement strategies to better understand how global warming will affect Queensland, how to transition to a low carbon future and how to adapt to the impacts of a changing climate.

A Climate Transition Strategy is being developed to prepare Queensland for the future, to manage the transition to a low-carbon world and ensure a fair share of the jobs and industries of the future are built in Queensland.

The government is also working with leading science bodies to develop a detailed understanding of how global warming will affect Queensland in the future under different warming scenarios.

This research will support a new Queensland Climate Adaptation Strategy, which is being developed in partnership with a wide range of sectors to address the risks to the economy, infrastructure, environment and communities from current and future climate impacts.

5.0 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.

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

5.1 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 implement appropriate mitigation and adaptation strategies to ensure the economic, social and environmental health of Queensland.

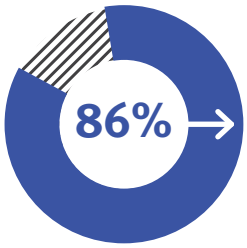
Climate variability statistics help with understanding Queensland's climate, especially in regard to agricultural and water resources. For example, with an understanding of historical climate variability and its drivers, climate outlooks can be developed using statistical modelling for specific periods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

Key findings | Climate observations

AVERAGE RAINFALL

In **2012**, Queensland experienced a **wetter than average** year,

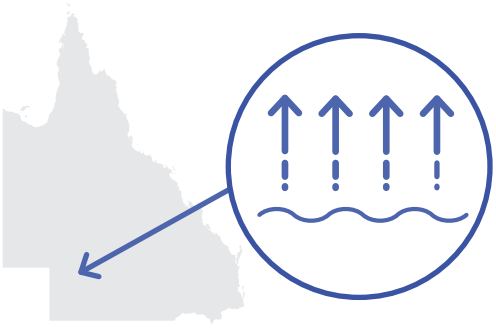
followed by much **drier years** from **2013–15**, leading to **widespread drought**.



As of **December 2015**, **86%** of Queensland was **drought declared**.

EVAPORATION RATE

Potential Evaporation is much **higher** than mean annual rainfall in **semi-arid inland** locations.



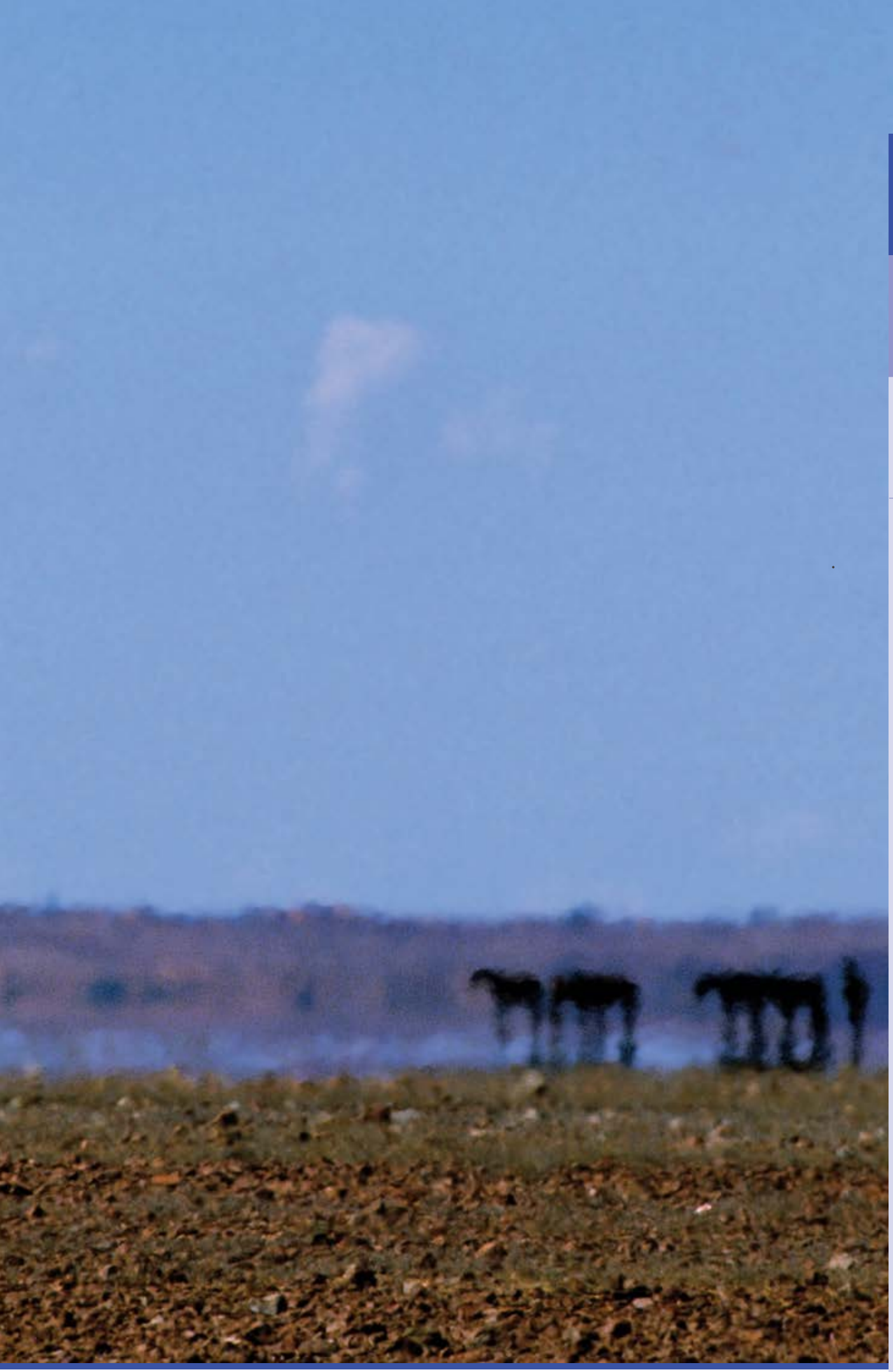
TEMPERATURE

Annual average temperature across Queensland **increased** by about **1.1°C since 1910**.

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

The **strongest warming** since **1960** has been observed across the **southern half of the state.**

Extremely warm temperatures have been experienced across Queensland from **2013 to 2015**, including the second, third and fourth **warmest years on record.**



5.2 Coast 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.

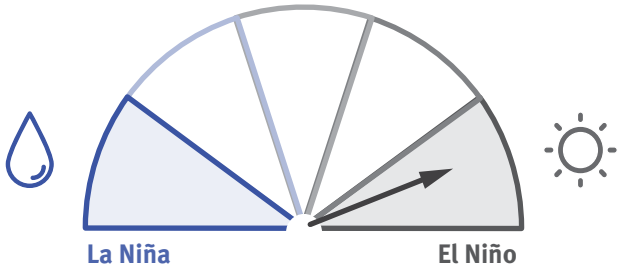
Coastal hazards impact on both the natural environment and human settlements. Coastal erosion and storm tide inundation are part of normal coastal processes albeit at the extreme end of natural fluctuations.

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

Key findings | Coast and oceans

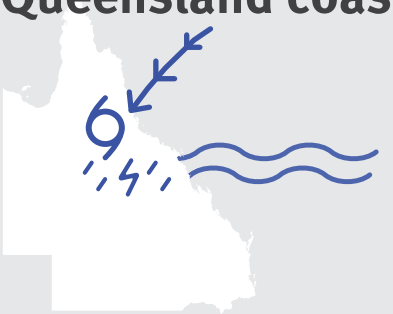
SOUTHERN OSCILLATION INDEX

A **transition** occurred from a **La Niña** in early **2012** to a strong **El Niño** during the second half of **2015.**



CYCLONE ACTIVITY

12 cyclones were experienced **between 2012 and 2015** including a number of **severe** category 4 and 5 cyclones which **impacted** the **Queensland coast.**



SEA LEVEL

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

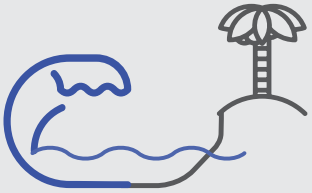
Changes between **2012 and 2015** were dominated by **seasonal trends.**

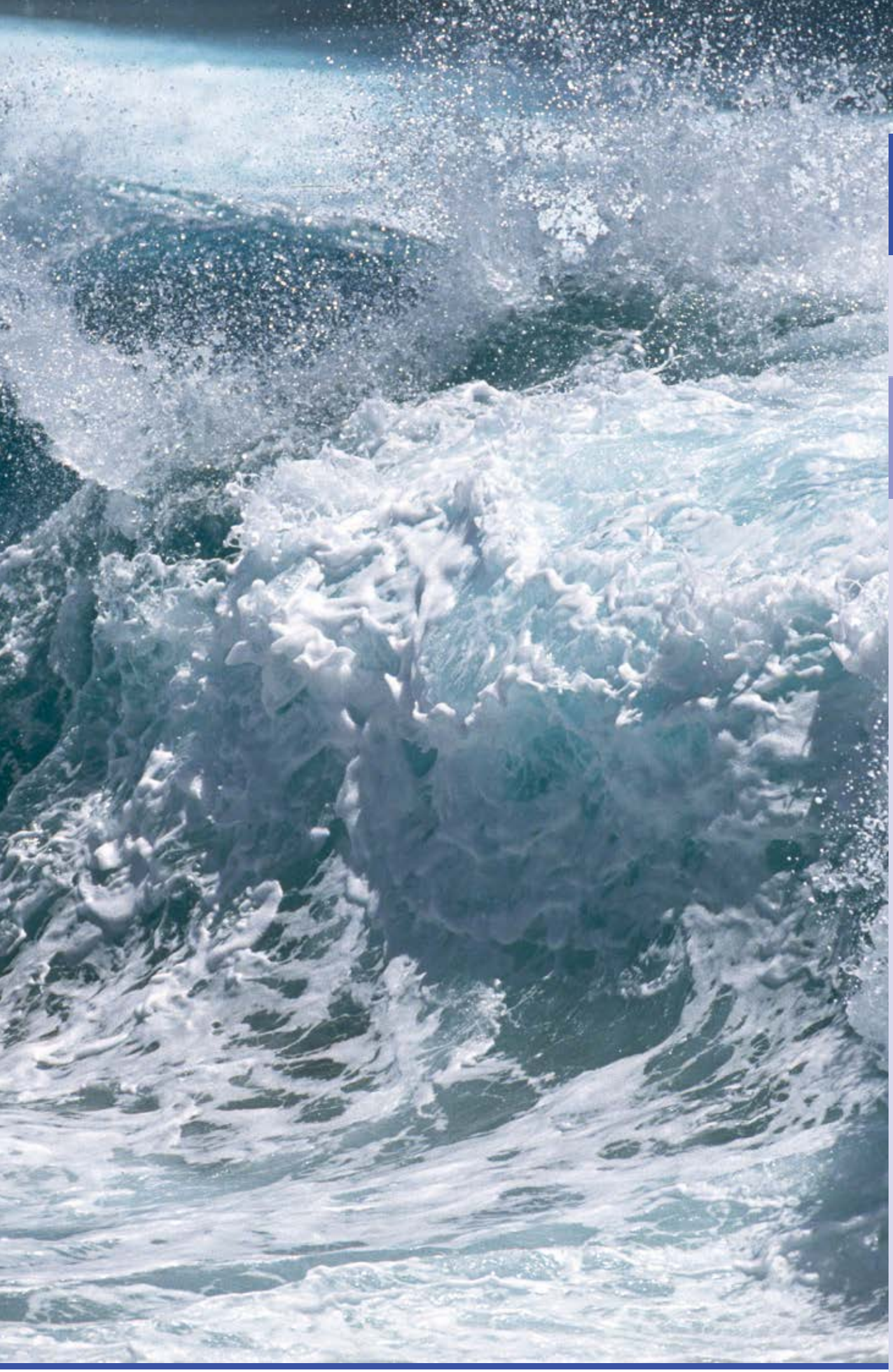
SEA SURFACE TEMPERATURE

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

EROSION PRONE AREA

During **2012–15, coastal erosion** continued to **impact** the **Queensland coast,** with **several major incidents** at developed areas.





5.3 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.

Management responses related to climate include:

Queensland Climate Adaptation Strategy

The Queensland Government is investing $3 million over three years to support the development and implementation of a Queensland Climate Adaptation Strategy (Q-CAS) in order to improve opportunities and reduce risks to our economy, environment, infrastructure and communities from current and future climate impacts.

Q-CAS will identify adaptation strategies that will enable sectoral groups, local councils and State government to become more resilient to climate change impacts. The draft Q-CAS will be released for public consultation in 2017.

Coastal Protection and Management Act 1995

Queensland's coast is a significant natural resource and provides valuable ecosystem services that support the state's economic and social development.

The *Coastal Protection and Management Act 1995* provides for the protection, conservation, rehabilitation and management of the coastal zone, including its resources and biological diversity.

QCoast2100

Over the next three years, the Queensland Government will invest $12 million through the Local Government Association of Queensland to help coastal communities plan and prepare for storm tide, coastal erosion and rising sea levels from climate change. Open to coastal councils, the investment will attract additional funding through local council contributions and support council decision-making along the Queensland coast.

QCoast2100 aims to support coastal councils in their progression from identifying coastal hazards and climate change risks through to the decision-making and implementation phases. The program recognises that Queensland's coastal councils are at different stages in their adaptation journey, with some yet to commence and others having completed a comprehensive coastal hazard adaptation strategy.

Shoreline erosion management plans

Shoreline erosion management plans, prepared by local governments with technical advice from the State, support localised, effective and sustainable responses to shoreline erosion issues within specific communities.

Coastal Management District

The *Coastal Protection and Management Act 1995* provides for the declaration of a Coastal Management District over coastal areas that need protection or management, especially with respect to the area's vulnerability to erosion, to maintain or enhance coastal resources, or for planning and development management of the area.

Coastal Management Plan

The Coastal Management Plan commenced in March 2014, formed under the *Coastal Protection and Management Act 1995*. It provides non-regulatory policy guidance to coastal land managers. The plan deals with key management policies such as:

- maintaining coastal landforms and physical coastal processes
- conserving nature
- maintaining access to coastal resources for indigenous cultural activities
- maintaining or enhancing public access
- management planning
- knowledge sharing and community engagement.

www.qld.gov.au/state-of-the-environment