Department of Environment and Resource Management

Building Nature's RESILIENCE

A Biodiversity Strategy for Queensland

Toward 2 Tomorrow's Queensland

Queensland Government

Prepared by:

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Department of Environment and Resource Management

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Premier's foreword

Science tells us that biodiversity is in decline in our state and around the globe and all governments must take action to protect the natural systems that support our lifestyles and future generations.

Queenslanders are uniquely positioned to make a difference now, in our lifetimes. We still have relatively high levels of biodiversity compared with many other parts of Australia and many countries around the world.

We have world-class national parks, strong environmental laws, internationally recognised scientific institutions, as well as many members of our community living and working on the land and sea, dedicated to protecting our environment.

This biodiversity strategy draws on the latest scientific thinking about resilience and a whole-of-landscape approach, while also recognising the many critical roles played by the Queensland community in delivering conservation success.

Governments cannot act alone in protecting our biodiversity. It is the community—primary producers on the land and sea, scientists, land care and environmental groups, motivated individuals and families—acting at a local level, who hold the greatest power and potential for biodiversity conservation in the state.

The strategy highlights the need for better understanding of the current and emerging threats to biodiversity, like the impacts of development and climate change, and the importance of being responsive to change.

The strategy addresses the need for biodiversity conservation to be a significant consideration in government decision-making and builds in appropriate reporting arrangements.

Building Nature's Resilience: A Biodiversity Strategy for Queensland is an enduring commitment to preserving our rich environmental heritage for future generations.

It is a commitment that defines a coordinated approach, recognising that government, industry, science and community must work together to protect our wealth of biodiversity and way of life.

The Honourable Anna Bligh MP
Premier of Queensland and Minister for Reconstruction

Minister's message

Queensland is home to unique ecosystems that support a range of remarkable species, half of which are found nowhere else in the world.

Building Nature's Resilience: A Biodiversity Strategy for Queensland is a whole-of-state blueprint for ensuring the conservation of our special natural areas and diverse wildlife for future generations.

The strategy establishes policy directions for conserving the state's biodiversity, covering the marine, freshwater and terrestrial environments. It makes biodiversity the central focus of the state's conservation efforts.

The concept of ecological resilience—the ability of a species or ecosystem to recover from the impacts of stressors and threats like climate change—is central to the strategy.

It is the responsibility of all Queenslanders to ensure our rich environmental heritage is protected so future generations can experience and appreciate it too.

A draft strategy was released for consultation in December 2010 to provide the opportunity for all Queenslanders to have their say about the future of the environment in Queensland.

My department received an overwhelming response from the Queensland community. After considering all of the feedback provided, I am pleased to present the final strategy, which will guide biodiversity conservation in Queensland over the next 10 years.

Thank you to all who contributed to the development of this strategy and who are helping to shape the future for Queensland's biodiversity.

The Honourable Vicky Darling MP
Minister for Environment

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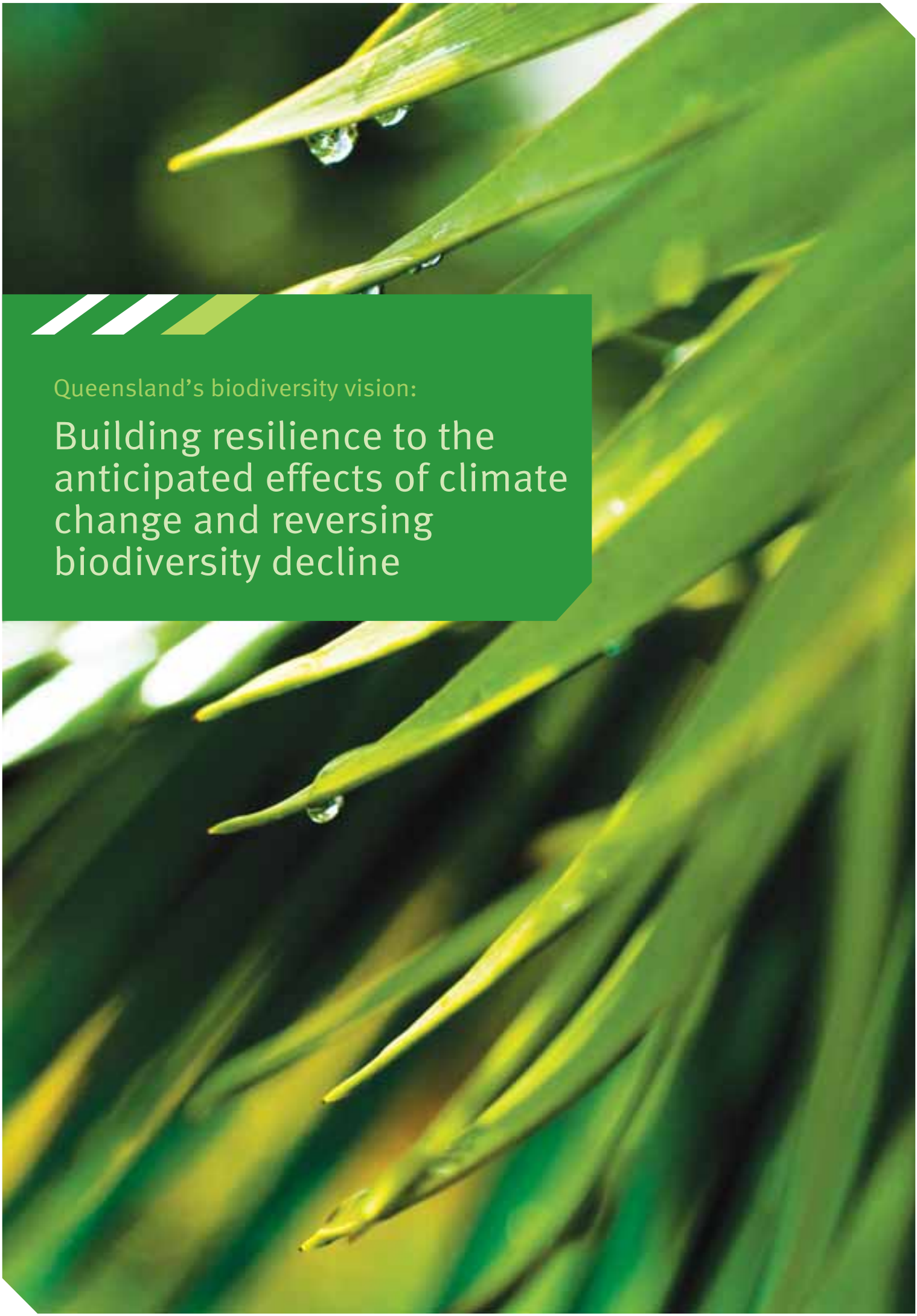


Queensland's biodiversity vision:

Building resilience to the anticipated effects of climate change and reversing biodiversity decline

At a glance:
targets for biodiversity in Queensland

Queensland's biodiversity strategy has two primary goals. By 2020 Queensland will:

- reverse the decline in biodiversity
- increase the resilience of species, ecosystems and ecological processes.

To achieve these goals, the strategy lays out three primary objectives and three supporting objectives each with key outcomes.

Primary objectives

1. Building resilient ecosystems

1.1 Building protected areas

Key outcomes

- Protected areas on public and private land provide sound foundations for landscape resilience.
- Queenslanders are connected with nature.
- Marine biodiversity is better understood, protected and valued.

1.2 Conserving species

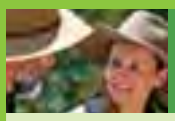
Key outcomes

- Greater protection of species and their habitats.
- At risk species populations are stabilised or recovered.

1.3 Managing extent, condition and connectivity

Key outcomes

- Stronger natural systems that can respond to threats and stressors.
- Climate change adaptation strategies that are flexible and responsive to new information.
- Improved management on privately managed lands provides greater safeguards for biodiversity values and ecological integrity.
- The contribution of Aboriginal and Torres Strait Islander Traditional Owners and communities to biodiversity protection and management is supported.



Supporting objectives

2. Managing adaptively

2.1 Valuing biodiversity

Key outcomes

- Increased community and industry understanding, participation and investment in biodiversity conservation activities.
- Strong partnerships between governments and between the Queensland Government and key industry and community sectors to support biodiversity conservation.
- Existing successful programs are consolidated and sufficiently resourced.
- The contribution to the economy and society of ecosystem services and natural capital is valued and accounted for.

2.2 Building knowledge

Key outcomes

- Decisions affecting the resilience of Queensland's biodiversity are based on best available science.
- Early warning of potential impacts of climate change and other threats on biodiversity and identification of strategic responses.
- Biodiversity benchmarks and indicators inform biodiversity management practices and decisions across the landscape.
- Aboriginal and Torres Strait Islander Traditional Owners' and communities' contribution to contemporary biodiversity protection and management is recognised and valued.
- The role of terrestrial, freshwater and marine ecosystems in the broader landscape is better understood and valued.
- Biodiversity data is accessible and used to support better policy development and decision making.

2.3 Managing responsively

Key outcomes

- Biodiversity is maintained, managed and/or enhanced.
- Government decisions are reviewed for their contribution to the achievement of biodiversity conservation outcomes.
- Biodiversity conservation is a core consideration of state, regional and local planning strategies and development decisions.
- Monitoring systems are in place to underpin adaptive management.
- There is a coordinated approach to biodiversity conservation across all levels of government.
- Accountability for meeting biodiversity outcomes is improved.

Time to act

The state's biodiversity is in decline and now is the time to act.

We in Queensland are custodians of some of the most important and irreplaceable natural treasures and we are managing these in trust for future generations.

As the state's population continues to grow, so too do the associated pressures on our unique natural environment.

The expanding footprint of human settlement and resource use is placing pressure on Queensland's natural systems. With the added impacts and uncertainty of climate change, conserving Queensland's biodiversity from these threats is now more important than ever.

As a key outcome from Shaping Tomorrow's Queensland: A response to the Queensland Growth Management Summit, Queensland's biodiversity strategy provides focus and priority for biodiversity conservation in delivering sustainable growth in Queensland.

This strategy places biodiversity at the centre of the state's conservation efforts and provides for an integrated and comprehensive conservation strategy for the whole of Queensland.

Our biodiversity matters

Healthy diverse terrestrial, freshwater and marine ecosystems are important for a productive and healthy environment and provide ecosystem services including a diversity of native plants and animals, clean water and productive land and oceans. Biodiversity is globally important, intrinsically valuable and vital to human activity and the well-being of present and future generations.

Biodiversity is also closely linked to culture, especially for Aboriginal and Torres Strait Islander people, and supports our lifestyles and well-being. Traditional Owners stress the importance of conserving biocultural diversity—not only the plants and animals of a place but the people, knowledge, stories, songs and traditions as well.

Biodiversity directly supports our society's economic security. The fishing and seafood industries, for example, are largely dependent on natural ecological systems for productivity and sustainable profit. Biodiversity in grazing systems is a key factor in good land condition and so is important to a sustainable beef industry in Queensland. Our natural ecosystems and our unique plants and animals are a resource for tourism and for recreation by Queenslanders throughout the state.

Native plants and wildlife from the reefs, rainforests, savannahs and wetlands provide the basis for a world-class biodiscovery industry, which is already developing new bioproducts such as medicines and natural pesticides, with food species and natural pharmaceuticals yet to be discovered.

The ecosystems of Queensland are unique and a global responsibility.

Queensland's rich natural heritage—a global responsibility

Almost half of the species living in Queensland are found nowhere else in the world. The number and uniqueness of our species mean Queensland carries an immense responsibility for conserving biodiversity.

Queensland is home to 72 per cent of Australia's native bird species, 85 per cent of its mammals, and just over half its native reptiles and frogs. More than 12 000 species of plants grow in Queensland.

Five of Australia's 15 natural World Heritage areas are based wholly or partly in Queensland: Wet Tropics; The Great Barrier Reef; Gondwana Rainforests; Fraser Island; Riversleigh Fossil Mammal Site.

The critical importance of this region in the survival of shorebirds is internationally recognised through the Japan–Australia Migratory Bird Agreement (JAMBA), the China–Australia Migratory Bird Agreement (CAMBA) and the Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA).

More than 600 000 hectares of significant wetland are protected under the international Ramsar Convention on Wetlands: Moreton Bay, Great Sandy Straits and Tin Can Bay, Corio Bay and Shoalwater Bay, Currawinya Lakes and Bowling Green Bay.

What is biodiversity?

Biodiversity is the variety of all life forms on earth—the different plants, animals and micro-organisms; their genes; and the terrestrial, marine and freshwater ecosystems of which they are a part.

Queensland's biodiversity is defined in the *Nature Conservation Act 1992* as 'the natural diversity of wildlife (including plants and animals), together with the environmental conditions for their survival'.

The Act also says this diversity exists at different scales:

Regional diversity—the different kinds of landscape.

Ecosystem diversity—the different communities of plants and animals.

Species diversity—the number of different species in an area.

Genetic diversity—diversity in the genetic make-up of individuals and populations.

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Why we need to act

- 70 per cent of our natural habitat in the eastern and south-eastern parts of Queensland has been lost because of clearing.
- Up to five per cent of coral reefs on the Great Barrier Reef were severely damaged by the temperature-induced mass bleaching events in 1998 and 2002.
- Estuarine and coastal transformation, over-exploitation and pollution have in some areas depleted important species, seagrass and wetland habitat, degraded water quality and accelerated species invasions.
- Some of our wilder places are experiencing the 'half-empty forest' syndrome, where ecosystems that appear to be natural have fewer species than they did a hundred years ago.
- 1076 plants and 289 animals are classified as endangered, vulnerable or near threatened under the *Nature Conservation Act 1992* at the time of publishing.
- 23 plant species and seven animal species (including six mammals) have become extinct in Queensland since European settlement.
- Even many of our 'common' species are diminishing—flocks of parrots and waterbirds are shrinking.
- Of Queensland's 1375 terrestrial regional ecosystems, 568 are classified as 'of concern' and 222 as endangered.
- Sediment and nutrient run-off in grazing and farming catchments are contributing to biodiversity loss in inland waterways, and marine and reef environments.
- These problems are compounded by altered fire regimes and invasive pests and weeds.
- Queensland is infested with 18 of Australia's 20 weed species of national significance.
- Some of our most important biodiversity regions have lost over 50 per cent of their native vegetation.

The Great Barrier Reef is not only the largest reef system in the world; it is also one of the best managed.

Queensland boasts a diverse landscape from wild rivers and wetlands, vast plains of natural grasslands, and productive seagrass beds, to an extensive intact savannah system and rainforests protected from logging. More than 1300 different terrestrial regional ecosystems have been defined here.

There is also a great diversity of habitat types within Queensland's marine environment. Queensland's waters provide important habitat for many marine species. Thousands of invertebrates and over 1600 species of fish are known to live in our oceans. Globally significant marine species include the dugong, whales, marine turtles, sawfish and giant clams. Many migratory seabirds and shorebirds also rely on our island and coastal habitats for at least part of their life cycles.

It is time to act to conserve our natural systems for current and future generations.

National and international context

Queensland's biodiversity strategy has been developed to work toward international and national agreements, policies and legislation aimed at the conservation and sustainable management of biodiversity.

At the highest level, Australia is a signatory to the United Nations Convention on Biological Diversity (CBD). Conservation and sustainable use of biodiversity are the key objectives of the CBD. These objectives have driven development at the national level of Australia's Biodiversity Conservation Strategy 2010–2030, which is a guiding framework for conserving our nation's biodiversity over the coming decades.

The Commonwealth's proposed Biodiversity Fund under Securing a Clean Energy Future will also play an important role for the conservation of Australia's biodiversity. The proposed fund will provide support for landholders to undertake projects that establish, restore, protect or manage biodiverse carbon stores.

Queensland's biodiversity strategy aligns with the directions outlined in the CBD, the national biodiversity conservation strategy and other national and state policies with its vision, targets and actions tailored to the Queensland situation.

The strategy takes Queensland on a journey, working toward international and national agreements, policies and legislation tailored to the Queensland situation.

Appendix 1 lists the broad range of state, national and international strategies, policies and programs that support our biodiversity.

Queensland is well-placed to act

Queensland still retains relatively high levels of biodiversity compared to most other Australian states and other countries giving us cause to be optimistic about the future.

We already have high awareness and high participation rates in land and catchment care activities and strong regional natural resource management in our communities.

Underpinning these foundations is a solid framework of legislation, plans and policies which will be essential in guiding biodiversity efforts.

Map 1: Queensland's protected areas

Threats to Queensland's biodiversity

In comparison with other states Queensland still maintains high levels of biodiversity. Yet many threatening processes are occurring within the state, which require action.

Although most of Queensland's ecosystems are threatened to some degree some are under considerably more pressure than others because of the different human activities occurring in each region. In general, threats and their intensity vary between east and west and also between north and south.

The coastal zone

In the more productive parts of the coastal zone, large areas have been extensively cleared for timber and farming, leaving highly fragmented areas in some regions. This has affected many species. For example, the koala in South East Queensland has dramatically declined due, in the main, to loss of habitat and fragmentation of remaining habitat by urban expansion.

The coastal zone and nearby mountain ranges of Queensland are particularly attractive places to live, which has put the remaining biodiversity of these areas under intense pressure from increasing population and development.

Urban development in the coastal zone as well as upstream land-use practices have degraded critical coastal habitats. Catchment run-off from urban and agricultural centres and from industry and some older treatment plants are a threat to the health, productivity and biodiversity of both the freshwater and marine environments.

Marine and freshwater environments

Marine environments in Queensland are suffering from land source pollution, as evidenced in the Great Barrier Reef where land run-off with high sedimentation is degrading the inshore reefs

and habitats. Although managed and regulated, a number of human activities continue to have a modifying effect on ecosystems with consequent potential for stress on biodiversity. These include dredging and spoil disposal, fishing and the impact of recreational use, especially in coastal areas with high population densities. Ocean acidification and warming from global climate change are compounding these impacts.

Freshwater biodiversity is experiencing much greater rates of decline than other environments due to over-exploitation of water, pollution, and modification of flows and hydrology.

The agricultural zone

The agricultural zone that stretches from the Atherton Tableland south to the cotton country of St George is a patchwork of cleared farming and grazing country dissected by steeper and rougher country that still retains good levels of biodiversity. Challenges for biodiversity conservation in this part of Queensland are keeping water courses healthy and re-establishing links in the landscape, especially in areas subject to past extensive clearing.

The far north and west

The less developed areas of the Gulf of Carpentaria, Cape York Peninsula and the arid and semi-arid inland have experienced little habitat loss from clearing and still retain many almost pristine waterways and marine systems.

However, much of this country is under pressure from the impacts of grazing and invasive species. Many western areas are largely intact but are under pressure from the impacts of grazing. Use of ground water in the arid and semi-arid zones can lead to the lowering of the water table with consequent loss of springs and permanent changes to these drier ecosystems.

A number of species extinctions and contractions (for example the bilby) accompanied the introduction of sheep and cattle in these areas.

Despite this, much of this vast zone maintains extremely high levels of biodiversity across a wide range of ecosystem types from rainforest to savannah.

While mining has had mostly localised impacts in the past, the expansion of the coal seam gas industry throughout the Surat and Bowen basins is increasingly being acknowledged as having the potential to impact on natural systems and biodiversity. In western Cape York Peninsula, the scale of the area available for bauxite mining also must be considered in terms of the long-term threats to biodiversity in that region.

The strategy must consider the significant threats to biodiversity in Queensland and demonstrate how all Queenslanders can contribute to their management.

Key threatening processes

The major threats to biodiversity in Queensland result from past and present reduction in the extent of habitat and impacts on habitat condition through fragmentation and degradation. Climate change will compound and increase the severity of current threats and create new pressures on many ecosystems. It is highly likely that some species might not be able to survive in the wild raising questions about adaptation responses and the degree of human intervention that may be acceptable.

The following threats are acknowledged at a global level as being most significant for the decline of biodiversity and are also relevant in the Queensland context.

Habitat loss, degradation and fragmentation

Habitat loss and the effect it has on ecosystems is the greatest threat to all of our terrestrial, freshwater and marine environments, and it can be caused by many different activities. For example, pollution, unsustainable land management, clearing and water extraction can all alter natural habitats.

The greatest direct cause of terrestrial habitat loss in Queensland has been broadscale vegetation clearing for agriculture and pasture. Now that broadscale clearing has ended, biodiversity gains will be made through regeneration in regrowth areas.

Intense urbanisation and population growth inevitably have an ecological impact including spread of pest plants and animals, road construction, water use and pollution.

Intensified land-use in areas already partially cleared results in a landscape less able to support biodiversity. Other changes include species loss, loss of regrowth and paddock trees, resulting in less connectivity and cover, as well as greater likelihood of increased chemical use and increased water requirements and irrigation.

Conversion of grazing lands to more intensive use such as horticulture often means more conflict between farmers and wildlife, as insects, birds and mammals are drawn to feast on crops.

Bilby on the road to recovery

The bilby was thought to be extinct until rediscovered at Diamantina National Park in 1988. Since that time, the species has been the subject of intense conservation effort and has been hailed as a conservation success story. Today, bilby populations live in a number of west Queensland locations, along at least one stock route and within several national parks including Diamantina, Currawinya and Astrebla Downs.

The protection of bilby habitat in areas such as Currawinya National Park has been a critical part of the species' survival. Currawinya has a 25 sq km area of habitat which was fenced in 2001 to prevent predator entry. The benefits of the habitat protection have been bolstered by the translocation of individuals into the park, starting with three female and one male in 2005. The released bilbies quickly adjusted to the habitat, digging burrows and feeding within hours of release. Through the addition of more individuals plus natural breeding, the population grew to 100 by 2009.

Further protection of the bilby's fragmented habitat has been aided by the growing area of suitable habitat protected through national parks and nature refuges in Queensland. Other threats include competition from rabbits and habitat modification through changed fire regimes. Much work has also gone into researching the bilby populations and their dynamics.

The recovery of the bilby is due to the concerted effort of the community, the value of the protected areas which conserve their habitat and the partnerships involved in the captive breeding program and habitat enclosure development. The bilby recovery initiative is a great example of government, community and industry effort focusing to achieve real conservation outcomes.

Roads, powerlines, gas pipelines, and other utilities fragment habitat, increase invasion of pest plants and animals, increase fire risk and result in road kills.

Most mining operations affect relatively small localised areas, but this can have significant effects where mineral deposits coincide with the distribution of endemic species and rare ecosystems, or where there are many mines across one ecosystem type in a region.

Unsustainable grazing (such as prolonged grazing at pressures that exceed forage growth) can alter the composition of grasses from perennials to annuals, remove the productive and protective soil crusts and lead to the 'tipping' of the ecological balance. The old and fragile soils in Australia are easily affected by hard-hoofed animals like cattle, sheep and goats. Other impacts of grazing include the introduction of weeds, disturbance and pollution of wetlands.

Off-stream watering points lead to lower average utilisation of the landscape by cattle and fewer heavily grazed hot spots but can lead to an overabundance of certain species, such as kangaroos, where these watering points are introduced.

Invasive species

Invasive species cause problems in Queensland's environment by out-competing or directly preying on native species or by altering essential habitats. Weed invasions, alongside habitat clearing, are one of the most significant threats to terrestrial ecosystems in Queensland, and invasive freshwater pests are known to degrade water quality and reduce the size of native fish populations. The release of ballast water from ships that have travelled internationally is one critical way that marine pests can be introduced into Queensland's waters. Climate change is likely to expand the ranges of some invasive species and accelerate their spread into new regions.

Some native species such as the noisy miner (or mickey bird) have become over-abundant in response to the changes we have already made to the natural environment in Queensland. Such species have in some areas resulted in biodiversity declines as they can out-compete other native species. Generalist species may become greater problems as ecosystems change in response to climate change.

Pathogens and disease also present a real and direct threat to Australian wildlife survival, particularly as other stresses such as pollution and changing ecosystems accumulate and reduce the resilience of populations. Myrtle rust is the most recent biosecurity risk and could threaten the health and viability of species and entire ecosystems.

Unsustainable use of natural resources

Unsustainable use of land, water and natural resources can result in habitat degradation as already described above. Unsustainable harvesting is also a direct threat to biodiversity. Many Australian animals suffered from hunting and over-exploitation in the early stages of European settlement which depleted population numbers. Illegal collecting of plants and animals is a continuing issue in some areas.

Over-fishing of any one species can alter food webs within ecosystems, and this can have a cascading effect on biodiversity. Equipment used in fishing can accidentally kill many species in non-target bycatch, including seabirds, turtles, dolphins and other marine life.

Changes to aquatic environments, water flows, freshwater systems and wetlands

In coastal and estuarine zones, trawling and dredging have degraded habitats, and sediment carried by coastal rivers onto the reef has caused degradation and permanent changes to ecosystem health.

Marine pollution and catchment run-off is posing a threat to the health, productivity and biodiversity of the marine environment. Good water quality is critical to maintaining coastal habitats and ecosystems.

Debris and pollution can also kill or stress wildlife, and toxins may increase the incidence of wildlife cancers and diseases. Entanglement is a key problem for marine mammals and turtles as a result of discarded fishing gear and rubbish.

Major threats to freshwater systems and wetlands include pollution (from point sources and the general environment) and sedimentation, weeds, feral animals, changes to drainage, water flow and water extraction. Uncapped bores have led to loss of pressure and decreased flows for natural springs. Increased water sources through the semi-arid and arid zones disadvantage some native species through changes in habitat and competition with water-reliant species.

Australian freshwater fish move along waterways as part of their life cycle. Fish movement ranges from short daily movements to long seasonal migrations. Fish movement in Queensland occurs all year round and is linked to environmental cues such as water levels, river flows and temperature.

Waterway barriers such as dams, weirs, culverts and causeways slow, limit or prevent fish movement. Waterway barriers have reduced the populations and distribution of native fish. Fishways have been installed in some cases to minimise these impacts.

Fire

Fire has the potential to inflict serious damage on biodiversity, and under climate change scenarios fires in parts of the state may become more frequent and severe. Poor fire management—either too frequent burning, burning at temperatures that are too hot, or not burning at regular enough intervals—can have major impacts on species diversity in many ecosystems.

A lack of fire management can also lead to damaging wild fires that escape into important remnant areas of habitat and wildlife refugia. Some scientists think that less burning since European settlement has meant that some grasslands have become dominated by shrubs and trees, and rainforests have expanded into wetter eucalypt forests, resulting in habitat loss for many species. It is important, however, to understand fire history and dynamics within a geological timescale.

The emerging threat of climate change

Climate change is recognised as a major threat to terrestrial and marine biodiversity and ecosystem function. Around the world there is growing evidence that the warming of 0.7 ˚C over the past century is impacting on terrestrial biodiversity.

If global greenhouse gas emissions continue to grow at rates consistent with past trends, the Intergovernmental Panel on Climate Change projects warming to be between 2.2 ˚C and 5.0 ˚C by 2070.

The implications of global warming at these levels for biodiversity would be profound.

Climate change in Queensland is expected to include altered rainfall and run-off patterns, sea level rise, ocean acidification, an increase in air and ocean temperatures, and changed frequency and intensity of weather events. Queensland has a very variable climate and the impacts of climate change will manifest across the state's bioregions differently.

For example, South East Queensland is expected to face more frequent and severe droughts and fires as a result of drier and warmer weather conditions.

Far North Queensland, which includes the Wet Tropics, is expected to have less frequent but more intense rainfall events, and less frequent but more intense tropical cyclones.

The Intergovernmental Panel on Climate Change in 2007 and The Garnaut Review in 2008 identified Queensland as particularly vulnerable to future climate change impacts due to the state's diverse and rich biodiversity and natural features.

This means that Queensland's iconic destinations—including the Wet Tropics rainforests, coastal ecosystems and the Great Barrier Reef—are at high risk to climate change threats and face potentially catastrophic impacts, including widespread species loss.

Many of the unique species found in the Wet Tropics have been identified by the federally commissioned Australia's Biodiversity and Climate Change 2009 report as facing potential extinction.

These species include the cassowary, mahogany glider and the white form of the lemuroid possum. Increased coral bleaching on the Great Barrier Reef, which has devastating implications for reef biodiversity, is another example of anticipated climate change impacts, with the occurrence of unusually high sea surface temperatures already triggering eight mass coral bleaching events since 1979.

In addition to direct climate change impacts such as temperature increase, climate change is likely to further compound existing threats common to many of the different ecosystems found in Queensland such as habitat fragmentation, changed fire regimes and invasive plants and animals.

Coordinated global action to dramatically reduce emissions may reduce the severity of these direct and indirect threats. However, the latest science indicates that there will be significant risks for ecosystems even if temperature rise can be limited to less than 2 °C. With decision makers required to plan for a range of future climate scenarios, the need for a flexible and adaptive management approach is evident.

A flexible approach will mean decision makers can develop practical strategies based on the latest science regarding the impact of climate change and likely responses by ecosystems. Understanding the vulnerability of Queensland's biodiversity and adaptation capacity in a changing climate is essential for managing threats.

The way forward

Many threatening processes are the result of historically common accepted practices and wisdom. Our knowledge and understanding has progressed over time and much has been done by community, industries and governments to stop and reverse some of these.

Good progress has been made

The watershed decision by the Queensland Government to end broadscale clearing in Queensland in December 2006, permanently protecting 70 million hectares of woody remnant vegetation, has profoundly advanced protection of biodiversity in Queensland and has provided a secure platform upon which many more significant policy and funding initiatives have built. The government has continued to build on this firm foundation for biodiversity protection with a number of significant commitments including:

- A major commitment to continued expansion of the Queensland national park estate ($55.9 million over five years from 2010–2011, building on the $5.8 million provided in 2009–10) means important areas of high biodiversity continue to be identified, conserved and managed.
- The Cape York Tenure Resolution Implementation Group (CYTRIG) enabling negotiation between the government, Indigenous organisations and conservation groups to protect the significant natural and cultural values of Cape York Peninsula through the dedication of national parks (Cape York Peninsula Aboriginal Land) and the return of homelands to Aboriginal Traditional Owners. The program also supports the remaking of existing national parks as national park (Cape York Peninsula Aboriginal Land).

- Purchase of 13 properties in the Cape York Peninsula Region, totalling 636 859 hectares at a cost of $23.5 million, since 2003. New national parks (Cape York Peninsula Aboriginal Land) include Lama Lama, KULLA (McIlwraith Range), Errk Oykangand, Marpa and Alwal. Rinyirru (Lakefield) National Park (Cape York Peninsula Aboriginal Land) is the most recent outcome of the program and represents transfer of the largest and most iconic national parks in the Cape York Peninsula region. This area of 544 000 hectares protects lagoons, billabongs, swamps, floodplains and lakes created by vast river systems including the Bizant, Normanby and Morehead rivers.
- The Queensland Government endorsement of a vision for North Stradbroke Island involving the phase-out of large-scale sand mining and the dedication of significant parts of the island as national park. $27.5 million has been allocated over five years from 2009–10 to allow the various aspects of this vision to be implemented. Critical to the government's vision for North Stradbroke Island is the finalised, successful negotiation of an Indigenous Land Use Agreement (ILUA) with the Quandamooka people, which acknowledges their native title rights as the Traditional Owners of the island. The joint tenure arrangements will also support significant training and employment opportunities.
- The Koala Response Strategy ($43 million over six years from 2009–10), which contributes to the Q2 target for increased greenspace areas and will provide for urgent protection of the declining koala population.

- Completion and implementation of the South East Queensland Koala Conservation State Planning Regulatory Provisions and the State Planning Policy (2/10): Koala Conservation in South East Queensland. The final State Planning Regulatory Provisions provide the strongest restrictions on development in areas where we know koalas are under the most serious threat—the Koala Coast and Pine Rivers—as well as ensuring that protections previously in place through the Koala Conservation Plan and the Interim State Planning Regulatory Provision remain.
- Funding of the successful NatureAssist Programs ($15 million over five years from 2010–2011) to support landholders in managing and protecting biodiversity in the long term. As at June 2011, a total of 398 nature refuges were registered in Queensland with a combined area of 2.79 million hectares.
- Clearing rates detected by Statewide Landcover and Trees Survey (SLATS) in 2005–06 and 2008–09 showing a reduction in clearing of woody remnant vegetation by 83 per cent and that clearing in 2008–09 affected just 0.05 per cent of all remnant woody vegetation. The 2008–09 SLATS report shows that most remaining clearing of remnant vegetation is for purposes that maintain remnant ecosystems like weed management, thinning and fodder.
- Expansion of the protection of vegetation across the state to include high value native regrowth vegetation, permanently protecting an additional one million hectares of land and a total of 2.3 million hectares subject to minimum standards and best land management practice.
- The Great Barrier Reef Water Quality Protection Plan 2009, which continues the protection of vital and globally significant marine ecosystems of the Great Barrier Reef World Heritage Area. This includes the introduction of the Reef Protection Package of regulation, extension and research to reduce the amount of pesticides, fertiliser and sediment entering the reef lagoon ($50 million over five years from 2009–2013).

- Queensland's Wild Rivers framework is a world leading approach to river preservation. Ten wild river areas covering almost 95 000 sq km of land have been declared to date, including Hinchinbrook Island, Fraser Island, Settlement Creek, Morning Inlet, Staaten and Gregory in the Gulf of Carpentaria, the Archer, Lockhart, Stewart and Wenlock (one of the most pristine and highly biodiverse river systems in Australia) on Cape York Peninsula. While ensuring that sustainable development can continue in declared areas, the wild rivers framework aims to protect the state's least impacted rivers from inappropriate development.
- Extension of the Wild Rivers framework into western Queensland with declaration proposals released for public consultation in December 2010 for the Cooper Creek Basin in the Lake Eyre Basin and in August 2011 for the Georgina and Diamantina Basins.
- The successful Wild River Rangers Program—currently 40 Indigenous rangers care for and promote the world-class natural values of Queensland's wild rivers in the Cape and the Gulf.
- Finalisation of the Queensland Coastal Plan including a State planning policy which is a leader in addressing coastal hazards associated with climate change impacts such as seal level rise. The Queensland Coastal Plan also identifies areas of high ecological significance in the coastal zone and establishes policies to support their protection.
- Completion of a number of important planning instruments to support biodiversity conservation including a State Planning Policy for Healthy Waters and another State Planning Policy for Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments.
- Adoption of a Biodiversity Offset Policy to increase the long-term protection and viability of the state's biodiversity where residual impacts from a development on an area possessing state significant biodiversity values cannot be avoided. The policy provides the framework to ensure that there is no net loss of biodiversity and establishes mechanisms to allow strategic outcomes to be achieved through the brokering role of the Balance the Earth Trust managed by EcoFund.

- A $700 million joint program with local government for sewerage system upgrades to reduce point source pollution impacting rivers and streams.
- The $20 million investment in the South East Queensland (SEQ) Healthy Waterways Strategy to reduce water pollution loads and restore degraded waterways through government-community collaboration.
- Finalisation of a Waste Reduction and Recycling Strategy supported by new legislation which includes strict illegal dumping penalties and anti-littering laws to reduce the impact on terrestrial and marine environments.
- Commencement of the new zoning plan for Moreton Bay Marine Park on 1 March 2009. The zoning plan expanded marine national park or Green Zones from 0.5 per cent to 16 per cent. A $15.1 million structural adjustment package was established to help the commercial fishing industry adjust to the new marine park zoning arrangements.
- The Queensland Government establishing six new artificial reefs in Moreton Bay Marine Park, at a cost of $2 million to provide recreational anglers with new fishing opportunities.
- 'Taking Bycatch Off Our Beaches', which provides funding to assist the commercial fishing industry to reduce its bycatch and unintended impact on marine biodiversity.

This project has given trawl operators access to bycatch reduction technologies that comply with international standards and world's best practice as follows:

- Since August 2008 $1.75 million has been allocated in the Queensland East Coast Trawl Fishery for financial assistance to fishers for fitting new devices (including Turtle Excluder Device (TED) and Bycatch Reduction Device (BRD); alternative BRD testing, and an extension and education program.
- A $1.25 million rebate scheme was implemented in July 2009 to provide rebates for highly effective square mesh codends in the scallop fishery and fisheye BRDs and TEDs for the entire trawl fishery.
- A $375 000 extension and education program, jointly funded by the Department of Employment, Economic Development and Innovation and the Fisheries Research and Development Corporation, was undertaken to improve the uptake and adoption of improved TED and BRD designs throughout the fishery.

Ongoing conservation commitments

In addition to the many initiatives already undertaken to protect Queensland's important biodiversity, there are a number of long-term programs with significant biodiversity outcomes that the government continues to support.

The South East Queensland Conservation Initiative incorporating the Springbrook Plateau Restoration Project involves an investment over 10 years to rehabilitate areas of high conservation value adjacent to the Springbrook World Heritage Area in the Gold Coast hinterland.

The Queensland Government has purchased 45 property lots covering approximately 705 hectares at Springbrook for rehabilitation. A total of $41.26 million has been spent to purchase lands that contain areas of rainforest under threat from development or where rehabilitation will restore critical habitat and landscape linkages. Over 560 hectares were added to Springbrook National Park in 2011.

The program will allow for these properties to be added to the Springbrook National Park and World Heritage Area following their rehabilitation.

The Queensland Government has had a long standing commitment to recognising both the cultural and natural values of Cape York Peninsula. This commitment acknowledges the concerns of both the conservation sector and Indigenous Traditional Owners and has seen the removal of potentially devastating sand mining leases from Shelburne Bay and the recognition of past injustices associated with the creation of protected areas.

Between 1994 and 2010, the Queensland Government spent in total $31 million and the Australian Government $3.4 million acquiring 1 546 849 hectares of areas of high conservation value land across the peninsula. The signing of the Cape York Heads of Agreement in 2001 represented a shift in policy to ensure that conservation outcomes included due recognition of the rights and cultural obligations of Traditional Owners.

The Cape York Tenure Resolution program was instituted in 1999 to manage these potentially competing interests. Negotiation continues with Indigenous landholders invited to enter into joint ownership and management agreements with the Queensland Parks and Wildlife Service (QPWS) in association with the declaration of national park (Cape York Peninsula Aboriginal Land) to increase protection of biodiversity in the unique landscapes of Cape York Peninsula.

This program also allocates areas to Aboriginal Freehold (a form of inalienable collective title) to allow Traditional Owners to return to Country.

This successful Cape York Tenure Resolution Program has already delivered major outcomes under its dual purposes of protecting areas of high conservation value and returning homelands to Traditional Owners to support social and economic opportunities.

More than half a million hectares of land has been included in national parks and nature refuges with a slightly larger amount of land also returned to Cape York Peninsula Traditional Owners.

Including acquisitions and supporting program costs, the Queensland Government has invested over $27 million in this program since 2003 in recognition of the internationally significant conservation and cultural values in Cape York. The process to develop a nomination for parts of Cape York Peninsula for World Heritage Listing with the consent of Indigenous land owners has also begun with $3.5 million allocated to ensure a comprehensive consultation process underpins the proposed nomination.

In September 2011, the Australian Government announced a massive injection of funding to support the continuation of these programs with $20 million allocated to further strategic land acquisitions to support the National Reserve System and another $3 million toward Indigenous engagement in the proposed world heritage nomination and to support documentation of the cultural and natural values of the region.

In a significant new investment for the national parks system, the government will phase out all mining and convert up to 80 per cent of iconic North Stradbroke Island to national park. The phasing-out of sand mining will allow North Stradbroke to evolve from an industrial site to a showcase for both native title holders and eco-tourism. Over half of the Island—about 13 000 hectares—is intended to be declared national park by the end of 2011. This major addition to the national park estate in South East Queensland will not only provide a much expanded recreation area on the doorstep of the most populous corner of the state but will also broker a unique partnership with the Quandamooka people who are the Traditional Owners of North Stradbroke Island.

The Statewide Forests Process, together with the South East Queensland Forests Agreement and Wet Tropics forest transfer arrangements, has delivered significant additions to the national park system in South East Queensland, Central Queensland and the Wet Tropics and is intended to continue until 2025.

Negotiations are currently under way to finalise arrangements for the Western Hardwoods and Cypress forest regions. When complete the transfers will result in another 1.5 million hectares being added to Queensland's national park estate.

The Queensland Biosecurity Strategy 2009–14 sets out the strategic directions all stakeholders in biosecurity will be working toward over this period. Positive outcomes for managing biosecurity risks and biodiversity protection are largely complementary. Measures in the strategy to prevent biosecurity threats becoming established include increasing the resilience of the natural environment.

Queensland's declared fish habitat area network protects and manages more than 1.1 million hectares of coastal fish habitats that sustain recreational, commercial and indigenous fishing activities along the east coast and in the Gulf of Carpentaria. The network protects these habitats from coastal development impacts.

Expert fishway teams have also been established by the state government to advise a wide range of stakeholders on new fish friendly structure designs and ways to retrofit fishways on dams and weirs or to modify the design of existing in-stream structures.

Changes to equipment and fishing practices are being adopted to minimise interactions with non-target species. Examples include the introduction of turtle exclusion devices, banning of trawling adjacent to turtle rookeries, and improved handling of incidentally caught protected species. Efforts are ongoing to develop better approaches over time.

Ongoing improvements and reforms to fisheries management since 1994 mean that Queensland's major fisheries are accredited by Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999* as being sustainably managed. The Fisheries Strategy 2009–2014 establishes ecosystem-based fisheries management (EBFM) as the model for sustainable fisheries and fish habitat management throughout Queensland.

This strategy builds on the significant progress already made by providing objectives and priority actions to inform future policies and investment necessary to respond to the continuing and emerging threats to biodiversity.

Building nature's defences

The success of biodiversity conservation in Queensland will rest on our ability to build nature's defences ensuring they remain healthy, diverse and resilient to inevitable change.

The latest international and national scientific consensus is that focusing on the whole land-to-ocean continuum will improve ecosystem resilience and protect biodiversity. In this model of biodiversity conservation, the emphasis is on building the capacity of the community, industry and individual managers of land and sea environments to integrate and coordinate responses.

Responses to threats are necessary across the whole-of-landscape (ecosystem-based management) including both publicly and privately owned land and marine environments, and should be supported by leadership, research and information, partnerships and adaptive management.

Foundations for a resilient landscape

This strategy takes a whole-of-landscape approach to conserving biodiversity to achieve one overarching goal—resilience.

The resilience of land and seascapes in resisting the many threats and pressures facing the natural systems is essential to conserving biodiversity and allowing nature to recover. When resilience is lost, ecosystems become weaker and unable to withstand these impacts.

At this point ecosystems can cross a critical threshold or tipping point—a point of no return—at which the ecosystem permanently changes to a new state with the flow-on impacts felt throughout the ecosystem's habitats and species and across land and seascapes. As tipping points are breached, connections are broken, species become extinct and biodiversity within our natural systems declines.

Knowing the tipping points, protecting the healthy ecosystems, repairing those that are fragmented and building strength and resilience across the landscape is therefore critical if we are to conserve biodiversity.

A whole-of-landscape approach allows us to do this.

It means that land, water and living resources, whether on public or private land, are managed in a way that promotes conservation while allowing for sustainable natural resource use.

This approach recognises the interdependence of the many habitats and ecosystems within the land- and seascapes while also maximising the preservation of species and habitats at a finer scale.

It is a model that encompasses a well designed and managed protected area system which provides cornerstones to conservation.

This approach, with cornerstones complemented by sustainable management practices across broad areas of land and sea, allows natural systems to reconnect, expanding the extent of biodiversity across land- and seascape.

The conceptual model (**Figure 1**) illustrates how connectivity across the landscape can be achieved by protecting areas of high biodiversity and reconnecting the landscape across private and public land and sea.

However, increasing the extent or 'connectedness' of the natural systems is not enough. Repairing health and condition within the ecosystems that have become fragmented and degraded is also important to protect against biodiversity and resilience being lost. Dealing with the full range of threatening processes is essential.

This is an approach that necessarily relies on partnerships between people and across sectors, sharing knowledge, resources and responsibilities.

Partnerships with scientists and researchers to identify the tipping points and critical factors for ecosystems are vital. Having access to knowledge to inform land managers and improve their ability to adapt and change decision-making is also important and allows them to respond to new and emerging threats, such as climate change.

By taking a collaborative approach to whole-of-landscape management, learning from past mistakes, and sharing information between organisations we can achieve a 'best-practice' approach to increasing resilience.

Evidence-based decision making

Evidence-based decisions informed by high-quality scientific research and an adaptive approach to environmental issues will, over time, deliver much improved outcomes for biodiversity.

Delivering a whole-of-landscape approach will also depend on biodiversity conservation being central to decision-making across private and public sectors. Monitoring and reporting on the state of Queensland's biodiversity is an important part of 'mainstreaming' consideration of biodiversity throughout the state.

Queensland's planning and development framework is used to identify and reflect the state's interests in biodiversity. In combination with the state's biodiversity regulations, the planning and development framework can enable integration of biodiversity and threatened species management into land use and development decisions.

Biodiversity conservation features prominently in regional natural resource management (NRM) plans. A number of these plans will progressively be recognised through the statutory regional plans and will continue to provide guidance for community, state and regional program investments.

Land management agreements, under the Delbessie Agreement, protect areas of high biodiversity value on rural leasehold land and provide incentives to leaseholders who demonstrate good management practices.

Ecologically sustainable development (ESD) has already been employed in legislation and policy in an attempt to provide an environmental context for decisions on development activities.

Once biodiversity is accounted for in planning and decision making at a mainstream level, the key players across all sectors of Queensland can deliver real conservation outcomes for biodiversity at a whole-of-landscape level.

Whole-of-landscape management

This strategy frames the delivery of a whole-of-landscape approach across the state, and across sectors, irrespective of tenure.

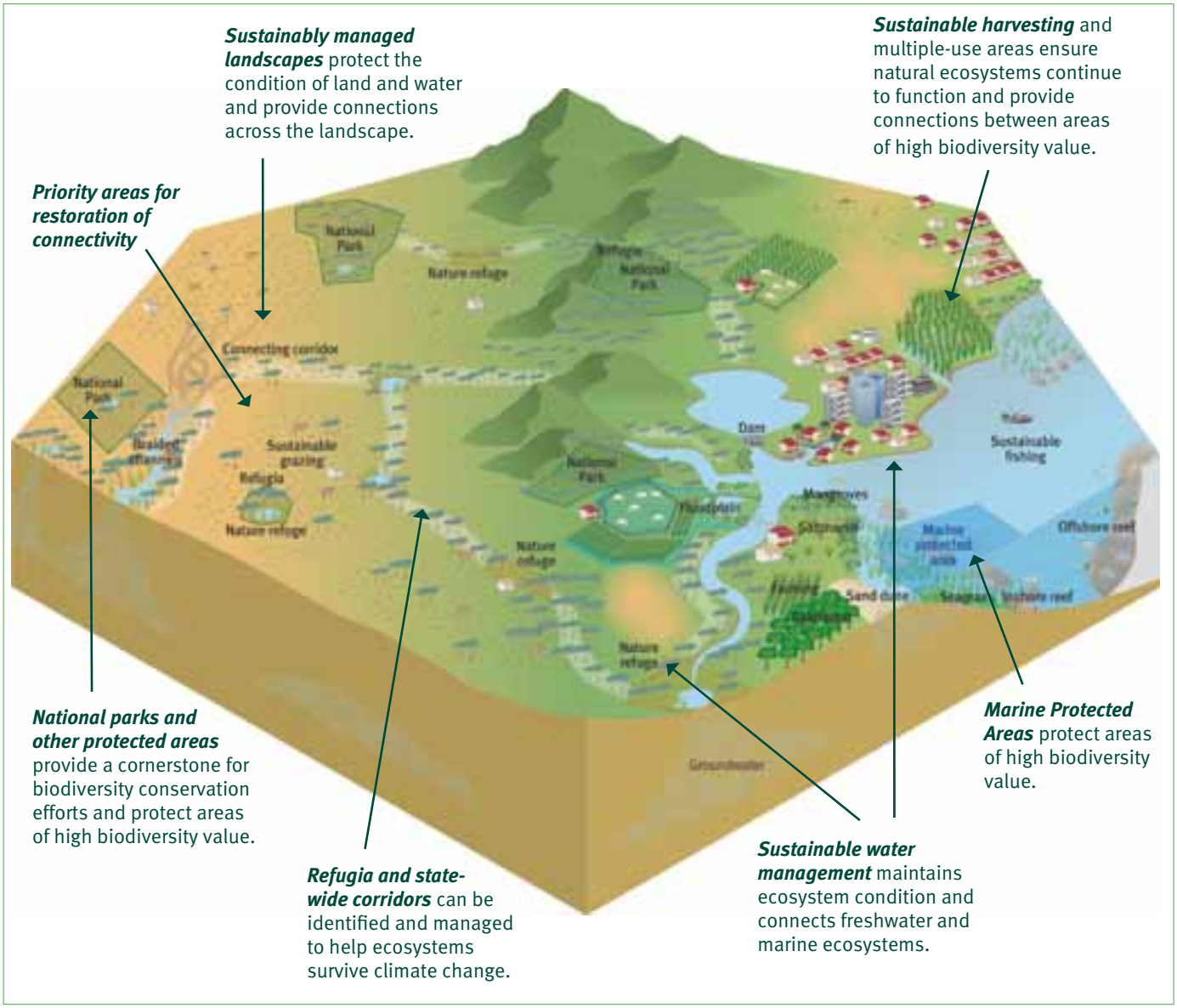
It focuses the targets, outcomes, strategies and priority actions on three areas:

- **Building protected areas** by expanding, strengthening and managing national parks, marine parks, World Heritage areas and other protected areas.
- **Conserving species** by securing priority species, protecting iconic species, keeping common species common and recognising the importance of healthy ecosystems and habitat.
- **Managing extent, condition and connectivity** by protecting and improving habitat, managing biosecurity risks and integrating Aboriginal and Torres Strait Islander management.

In order to deliver the whole-of-landscape approach, we need to:

- **combine our efforts** by recognising the key players in biodiversity conservation and building partnerships to achieve it
- **manage adaptively** by collaborating for scientific evidence and advice, and applying this to the planning and management of Queensland's natural systems across sectors.

Figure 1. Reconnecting ecosystems across public and private areas



Combining our efforts: a partnership approach

The whole-of-landscape approach is dependent on a network of partnerships that have the protection and restoration of biodiversity at the core of their objectives. The important role of partnerships between government and industry groups, landholders and managers, and community and corporate entities in achieving biodiversity outcomes is already widely recognised in Australia.

Key non-government players for managing terrestrial biodiversity in Queensland include freehold and leasehold land managers—the stewards of biodiversity across the vast area of Queensland outside the protected area system. Their land practices and commitment to biodiversity can make a substantial difference to biodiversity in Queensland.

Fishers and tourism operators, who work in the marine environment, can play a significant role in monitoring and maintaining the health and resilience of these ecosystems.

Leadership in ecologically sustainable business and management practices ensures not only the protection of biodiversity but improves long-term viability and profitability of their businesses.

Researchers and scientists can enable managers of the state's natural resources to adjust their planning and respond adaptively to the changing natural environment, providing confidence that their decisions are evidence-based and supported by scientific rigour.

Queensland's Traditional Owners—Aboriginal and Torres Strait Islander people—have traditional and continuing cultural connections to the land, which they use, protect, conserve and manage.

Modern natural resource managers worldwide are recognising the importance of traditional ecological knowledge. More and more, governments, industry and community organisations are drawing on the expertise of Traditional Owners, with many undertaking key roles in cultural and natural resource management. Merging traditional ecological knowledge with western science adds another dimension of understanding to the complex issue of Queensland's biodiversity while preserving our vital biocultural heritage.

By combining efforts across industries, integrating government efforts, and harnessing the broader community's willingness to act, significant advances in biodiversity conservation can be made.

Through the combined efforts of industry, government and the community we can deliver real change for biodiversity conservation in Queensland.

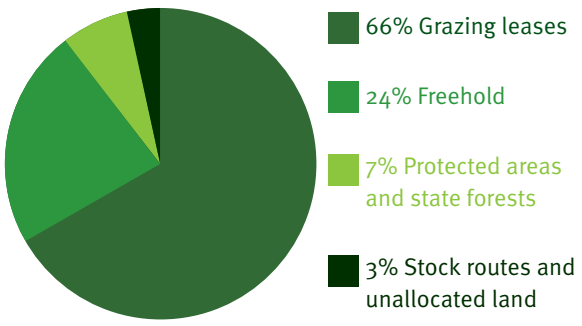
Rural industries

Landholders, individually and through their industry groups, have played and will continue to play an important role in nature conservation in this state. Many are primary producers and they, coupled with commercial fishers and tourism operators, will be pivotal to preserving biodiversity in Queensland. The agricultural industry manages most of Queensland's land area (82 per cent in 2007–08). Of this, 94 per cent of this land is used for grazing with the remainder for copping.

With grazing leases, freehold land and cropping dominating land use in terrestrial Queensland (as shown in the chart below) it makes sense that these landholders are vitally engaged in activities that have biodiversity benefits.

The state has achieved significant results for biodiversity conservation through landholder partnerships with particular sectors.

Figure 2. Terrestrial land use in Queensland



Growing these partnerships through mechanisms such as nature refuges and land management agreements is a feature of the strategy.

Working together with private landholders who have biodiversity values on their land will advance connectivity significantly and restore some ecosystem health.

Fishing and marine tourism

In the marine environment, about 72 per cent of Queensland's coastal waters are protected in marine parks. These marine parks provide varying degrees of protection from high protection to other areas zoned for managed use. Under the *Fisheries Act 1994*, 1.1 million hectares are protected as fish habitat areas, further supporting fisheries sustainability.

The majority of Queensland's waters is open to use for activities such as tourism and fisheries (as shown in **Figure 3** on page 30), which makes these stakeholders critical partners in managing and improving marine biodiversity.

Tourism sector businesses more than most other sectors recognise their dependence on the state's natural systems for their business success.

Effective conservation measures protecting coastal ecosystems and water quality, sustainable fishing practices, and conservation measures delivered through these key players, will have the greatest effect on the natural marine systems.

Partnerships with these groups can therefore encourage sustainable activities in marine environment and help protect marine biodiversity.

The fishing industry is the primary user of a large extent of the marine environment and, as such, plays a vital role in managing the marine biodiversity. Commercial and recreational fishers have become increasingly aware of their environmental responsibility and use an array of environmentally friendly devices and practices that aim to reduce the impacts on marine systems. Fishers can also have a significant positive impact on marine biodiversity through their compliance with guiding legislation.

Urban development

Urban development affects Queensland's ecosystems, both terrestrial and marine, as it responds to the demands of the state's increasing population. Partnerships between progressive companies and all tiers of government can and do provide benefits in terms of piloting innovative solutions to ecosystem management and the provision of infrastructure and services. Well targeted biodiversity offsets to mitigate the impacts of development can assist in restoring areas of high value.

Mining

The mining industry is working to replace the value of environmental features that may be lost through development of the state's mineral resources. Proponents are required to assess environmental impacts, and develop strategies to minimise and manage these impacts and risks prior to the grant of a mining lease. Mining companies can also use environmental offsets to counterbalance any unavoidable environmental impacts that may result from mining processes. In addition to these requirements, mine operators are also required to rehabilitate a mine site prior to the surrender of a mining lease.

Further opportunities exist for increased corporate investment through environmental philanthropy in the form of direct sponsorships.

A new draft policy released by the Queensland Government for consultation in August 2011 restricts certain mining activities close to urban settlements. The policy allows for an exploration restricted area to be declared over land bound by the South East Queensland Regional Plan as well as other regional centres and towns with a population of 1000 or more. Under the policy, amendments to the *Mineral Resources Act 1989* will also prevent existing exploration tenure holders from undertaking any exploration activities in and around all urban areas across Queensland.

Marine transportation and port industries

The marine transportation and port industries sector is expanding to keep up with population demands. These players have been directly investing in customising their vessels with deflector devices to limit species' injury and death and upgrading treatment systems before discharging into oceans and rivers.

Knowledge industries

Researchers and scientists are critically important in providing evidence on which to base management decisions and develop policies, as we strive to better understand the complexities of these natural systems.

Strengthening the partnerships between researchers and natural resource managers and using their considerable networks to focus their research efforts toward gains for biodiversity will provide a strong base of research and knowledge from which we can all draw.

Opportunities to work with the education sector through public and private schools also need further investigation to look at ways to provide greater support to teachers and to harness the energy and enthusiasm of young people.

Young people

The Queensland Youth Environment Council (QYEC) is one of the government's key mechanisms for engaging with young people on environmental issues. It was formed in May 2007 and provides advice to the Minister for Environment and the Minister for Education and Industrial Relations on key environmental and sustainability issues, including climate change, water use, renewable energy, biodiversity conservation and waste.

Council members act as youth leaders to enhance awareness and inspire other young people to take action to achieve a more environmentally sustainable future for Queensland. QYEC is active in the secondary and tertiary education sectors and provides a unique opportunity to help build a culture of sustainability in young people.

Indigenous knowledge and skills

Aboriginal and Torres Strait Islander communities have strong links with the land, rivers and sea and many already participate actively in conservation efforts.

Shared management of national parks, nature refuges and marine protected areas is a growing area of partnership between governments and Aboriginal and Torres Strait Islander communities.

Sharing knowledge between western scientists and Traditional Owners will provide much richer evidence on which to base management of land and seascapes.

Traditional knowledge projects, land and sea country management and recognition of the intellectual property associated with many bush foods and medicines offer new opportunities for economic development as well as biodiversity outcomes of benefit to the whole of Queensland.

Conservation and natural resource management (NRM) sectors

Non-government organisations (NGOs), including conservation groups, are already participating in planning, coordinating and monitoring biodiversity.

Many conservation organisations also play an important role in lobbying policy makers, leveraging support and delivering on-ground outcomes.

State and national groups such as the Queensland Conservation Council, Wildlife Preservation Society of Queensland, World Wide Fund for Nature, National Parks Association of Queensland, The Wilderness Society, Australian Rainforest Conservation Society and the Australian Conservation Foundation have devoted considerable resources over many decades to advocate for better protection and management of Queensland's internationally significant biodiversity values.

The network of regional conservation councils has been established since the 1970s and continues to address a wide range of issues affecting biodiversity across the state.

Other organisations such as Greening Australia, Australian Wildlife Conservancy, Bush Heritage and The Nature Conservancy are actively involved in hands-on biodiversity protection through the purchase of important areas for private conservation and other major landscape rehabilitation projects.

The Landcare movement plays an important role by advocating for the protection of environmentally sensitive areas, marshalling community support, and suggesting solutions or alternative conservation policies for environmental problems.

The state's 14 regional natural resource management (NRM) bodies have been very successful in establishing regional natural resource management plans which include achievement of biodiversity outcomes, undertaking natural resource management projects and in leveraging investment and community support for these activities.

The state's Q2 Coasts and Country funding program combined with the Australian Government's Caring for Our Country program has provided a major investment in these regional NRM organisations to build the basis for a statewide partnership to deliver agreed biodiversity and resources management outcomes.

Community volunteers

The potential for Queenslanders to effect change in biodiversity outcomes is enormous. Currently more than 320 community groups and 35 000 individual volunteers participate in biodiversity protection across Queensland.

Having community volunteers engaged in important habitat restoration and wildlife conservation has already delivered results and volunteers have become a pivotal part of the conservation activities within the state.

Queenslanders can get involved by joining their local Landcare or catchment care group if they are concerned with biodiversity issues in their own area. Activities like monitoring species under threat or revegetating areas that have been denuded in the past can contribute considerably to biodiversity conservation.

Groups such as Seagrass-Watch, a global scientific seagrass assessment and monitoring program that raises awareness on the condition and trend of near-shore seagrass ecosystems, also provide an early warning of major coastal environment changes.

Through this collaborative approach we can work together to harness the enthusiasm of all Queenslanders to cherish and protect our great natural legacy.

In implementing this biodiversity strategy the government hopes to work with all these groups and industry sectors to focus our collective efforts on priority areas of need and to identify new investment opportunities and new partnership arrangements for biodiversity conservation.

Australian Government

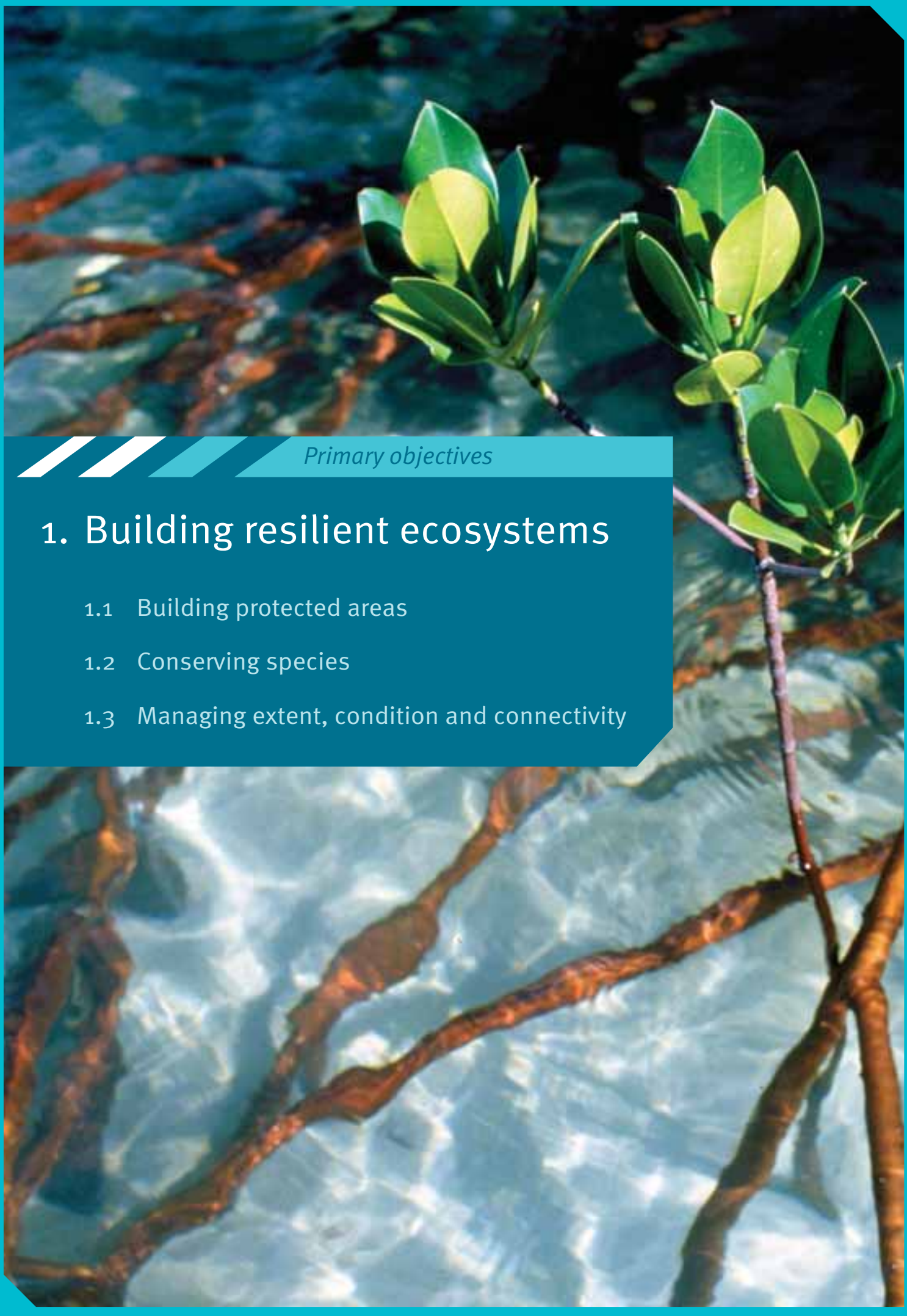
The Australian Government has a role in developing and implementing national policies and strategies for biodiversity protection including partnership initiatives such as the Reef Water Quality Protection Plan. The Australian Government, in partnership with the Queensland Government, plays a direct role in the management of some coastal and marine areas, such as the Great Barrier Reef Marine Park and the Torres Strait Protected Zone. Through major programs, such as Caring For Our Country and the recently announced Biodiversity Fund under the Securing a Clean Energy Future initiative, the Australian Government offers opportunities for meaningful partnerships across a range of sectors and between the three levels of government.

Local government

As the arm of government operating most closely to local communities and the primary implementer of many regulations and policies associated with land use and pest management, local government is uniquely placed to promote and support the protection and rehabilitation of biodiversity values.

Many local governments contribute significantly to the regional protected area estate through conservation levy based land acquisitions.

They are also the repositories of much of the data vital to enable monitoring and evaluation of the status of our biodiversity values. Closer links between all levels of government are needed to maximise conservation effort and to build better networks to ensure effective coordination and communication on vital aspects of biodiversity protection and management.



Primary objectives

1. Building resilient ecosystems

1.1 Building protected areas

1.2 Conserving species

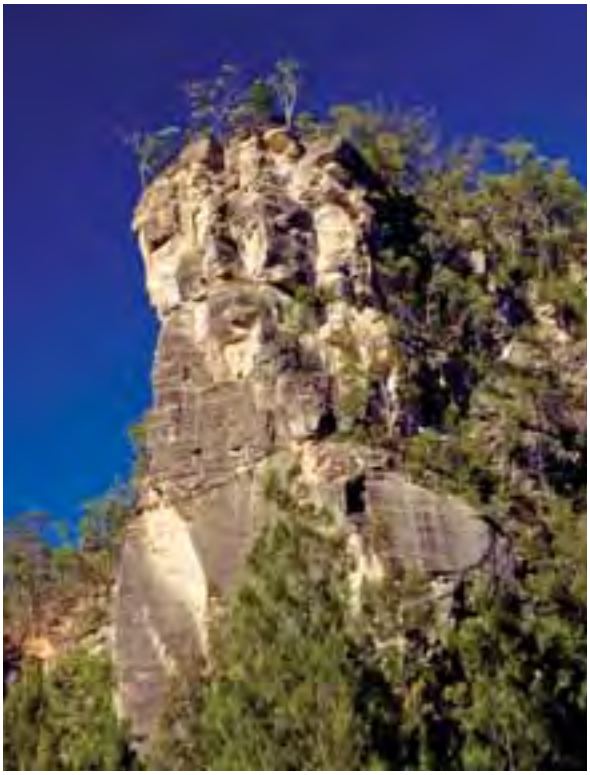
1.3 Managing extent, condition and connectivity

1.1 Building protected areas

2020 Targets

By 2020

- 7.5 per cent or 13 million hectares will be protected under national park tenures
- an expanded network of border to border marine parks will be established
- the total area of Queensland in the protected area estate will be 20 million hectares of which seven million hectares is in tenures other than national parks
- all areas in Queensland identified as suitable for World Heritage natural values listing have been nominated and suitable management regimes are in place for declared areas
- all protected areas in Queensland are managed in accordance with defined standards which equal or better the best international practice.



Queensland's protected areas are the cornerstones of an integrated strategy to conserve Queensland's biodiversity. **Map 1** on page 5 shows the extent of Queensland's protected areas.

They include national parks managed for conservation, public access and presentation as well as freehold and leasehold lands devoted to conservation through covenants.

These protected areas—national parks, marine parks, conservation parks, fish habitat areas and other protected areas— build ecosystem resilience to climate change and other threats and connect the Queensland community with nature.

For Aboriginal and Torres Strait Islander people, these places hold special spiritual and custodial significance. Consolidating and appropriately managing these places preserves these connections and sense of belonging to the landscape.

The story so far

The first official protected areas in Queensland were declared in places of great scenic beauty. Since the 1970s, the design intent for building Queensland's terrestrial network has been the systematic protection of a full range of biodiversity across the state, including not only the scenic and diverse areas near the coast, but also samples of deserts, woodlands and grasslands.

This has been based on a bioregional approach, using regional ecosystems as a finer-level representation of biodiversity to guide protected area selection. The bioregional approach is the basis of the 'comprehensive, adequate and representative' (CAR) protected area system, which is a primary goal of the terrestrial National Reserve System Australia-wide.

For the marine environment, Queensland has relied on the guiding principles of the National Representative System of Marine Protected Areas to inform marine conservation management at an ecosystem level.

This approach is also based on having a 'comprehensive, adequate and representative' system of marine protected areas that includes some highly protected areas. Queensland has worked toward marine conservation through a range of protection and conservation tools.

Working in remote marine parts of Queensland and effectively working with Indigenous communities in areas such as the Gulf of Carpentaria remain challenges.

Terrestrial national parks in Queensland now amount to 4.9 per cent of the state's area, and all terrestrial protected areas (including nature refuges) total 6.65 per cent. Over the last decade, substantial areas have been added to the protected area estate through the Statewide Forests Process which has transferred State forests of high conservation values to national park.

The graph in **Figure 4** on page 30 shows the development of national park acquisition from the early years of last century being driven initially by scenic values with a relatively slow growth of the estate. From the 1970s onwards, as community demands for a much greater recognition of the need for nature conservation grew, national park acquisitions were increasingly influenced by the need to bring a wider range of ecosystems into the conservation estate.

Projected acquisitions show the transformation in an approach driven by the state government's Q2 commitment to expand the national park estate guided by science and principles detailed in the companion document to this strategy, Protected Areas for the Future.

National and marine park estate

An estimated 80 per cent of Queensland's regional ecosystems are represented to some extent in national parks. However, there are significant gaps in the protected area system.

Many significant ecosystems, with their unique plants and animals, are not yet in reserves and many other ecosystems have only very small parts captured in protected areas.

Multiple use marine parks have been declared within nine of the 13 marine bioregions in Queensland with this expanse collectively covering about 72 per cent of Queensland's coastal waters.

Guiding principles for selecting new terrestrial protected areas:

Comprehensive, adequate and representative system

- Include, as a primary focus, as much biological diversity (using regional ecosystems as a surrogate) in each bioregion and subregion.
- Design the protected area system to build resilience to climate change and other threatening processes.
- Improve the 'adequacy' of the protected area system with multiple, linked and suitably large areas for species and communities to survive, building on existing protected areas so they are easier to manage and more resilient to threats.
- Consider functional diversity within selected areas as a prerequisite for ecosystem resilience.
- Conserve priority ecosystems and species through selection of additional areas, primarily where clusters of priority species occur.
- Include, where practical, representation of the variety of geological features, freshwater ecosystems and wetlands.

Social, health, educational and economic benefits

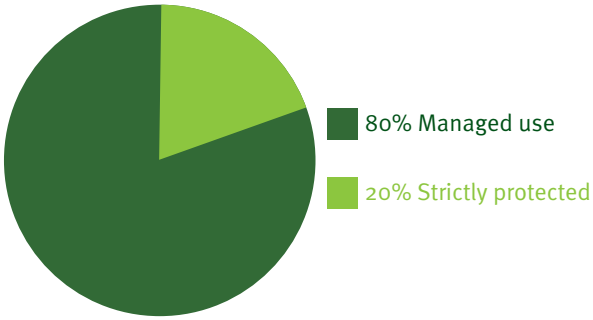
- Identify new tourism and recreation opportunities considering socioeconomic impacts and benefits.
- Conserve cultural and scenic values, in particular natural sites of high cultural value to the community, recognising the experience and contribution of Traditional Owners in managing their country.

Practicality and urgency

- Ensure that the best areas are selected considering costs of acquisition, availability of properties, practicality, suitability of restoration and future costs of management.
- Complement other reserves in the National Reserve System, including Indigenous Protected Areas and Private Protected Areas.
- Consider the level of threat to defined biodiversity areas in the prioritisation of acquisition and other biodiversity actions.

Within these waters both State and Commonwealth marine parks include about 20 per cent strictly protected zones and 80 per cent of zones for managed use. Some marine and estuarine habitats are also included in national parks and conservation parks declared under the *Nature Conservation Act 1992* or within non-statutory Indigenous Protected Areas with 1.1 million hectares of fish habitat areas also declared under the *Fisheries Act 1994*.

Figure 3. Percentage area of strictly protected marine park zones (State and Commonwealth) within Queensland coastal waters

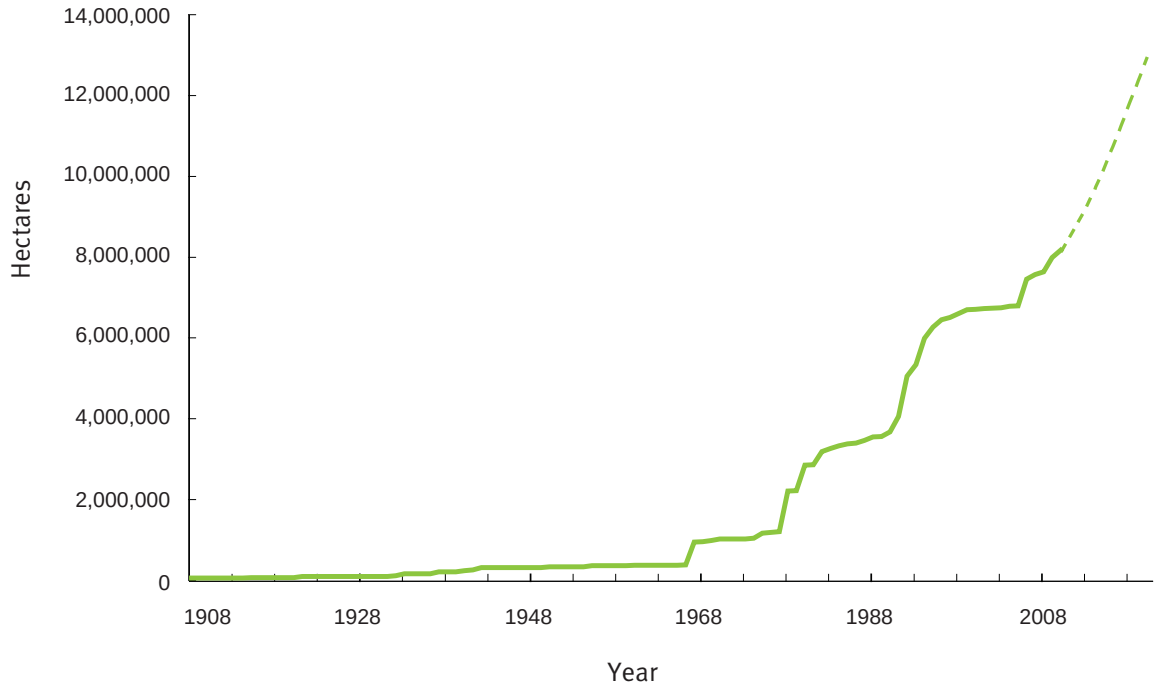


Protected area coverage in the northern waters remains poor. Some marine bioregions in the Gulf and Torres Strait, which support significant biodiversity including the world's largest breeding colony of crested tern and the world's most important seagrass beds for dugongs, are not represented by marine protected areas at all.

A significant increase in strictly protected zones recently occurred within marine parks in Queensland. One third of the Great Barrier Reef (State and Commonwealth) is now strictly protected, while the government increased strictly protected zones in Moreton Bay Marine Park from 0.5 per cent to 16 per cent in 2009.

Protected areas under the *Nature Conservation Act 1992* are now complemented by other reserve types including private protected areas which are managed by non-government organisations, and Indigenous Protected Areas, managed by Traditional Owners. These areas protect important habitat as well as provide connectivity across the landscape managed by Traditional Owners.

Figure 4. Increase in national parks, with projected transformation in rate from 2010–2020



Growing role for Indigenous management

Aboriginal and Torres Strait Islander involvement in protected area management across the state has been steadily increasing. The declaration of the first five areas as a new class of protected area—National Park (Cape York Peninsula Aboriginal Land)—by 2010 has marked very important progress in Indigenous partnership.

Traditional Owners now have Aboriginal freehold title and the area will always be managed as a national park under the *Nature Conservation Act 1992*. This program also contributes to goals under the 'Closing the Gap' program, which commits to improving the well-being of Indigenous Australians.

Nature refuges

Nature refuges are voluntary conservation agreements made between the State and landholders intended to perpetually protect conservation values on privately managed properties. The Nature Refuges Program is widely supported by conservation, natural resource management and industry interests, including AgForce as a major partner.

As at September 2011 there are 398 nature refuges across all bioregions of Queensland, protecting a total of 2.8 million hectares. Nature refuges make a crucial contribution to Queensland's protected area conservation, protecting 215 185 hectares of 46 regional ecosystems that are not represented in national parks or other protected areas. Approximately 40 per cent of the total nature refuges area—1.11 million hectares—also protects 242 regional ecosystems that have only low representation in other forms of protected area.

Managing protected areas

Queensland's protected area workforce manages marine and terrestrial parks and reserves for two primary purposes: to permanently preserve the area's natural condition and cultural resources; and to present these values to the public where possible.

Marine protected areas also have the purpose of ensuring long-term sustainable use. Management of the Great Barrier Reef Marine Park is undertaken through a joint management arrangement of the Queensland and Australian governments, and this management is known throughout the world for its high standards. Marine park officers along with community rangers and Queensland Boating and Fisheries Patrol have been vital in the management of our marine protected areas, undertaking a broad range of assessment, management, monitoring, surveillance and enforcement functions.

Protected areas need to be managed as part of the wider landscape—neither native animals nor pest plants and animals respect park boundaries, and fires also move across the landscape regardless of tenure.

Good neighbour relationships between park rangers and private landholders are critical in managing pests, in planning for and controlling fires, and in protecting biodiversity on both sides of the fence.

The 2001 Master Plan for Queensland's Parks System established the vision and direction for the management of terrestrial protected areas. In the last decade, much progress has been made in carrying out the strategies outlined in the Master Plan and these have included:

- increased effort to minimise the impacts of pest species on biodiversity and implementation of fire management systems to improve ecological condition and protect life, property and other cultural values
- stronger partnerships with Aboriginal and Torres Strait Islander people throughout the state. In the far north of Queensland, new initiatives include the declaration of Cape York Peninsula Aboriginal Land (CYPAL) and the development of Indigenous Management Agreements (IMA) between the Queensland Government (Department of Environment and Resource Management) and a land trust
- the Great Walks of Queensland, designed to sustain local economic employment and provide short and long distance walking opportunities to some of the Queensland's most spectacular park destinations.

Other management initiatives include:

- response to and management of environmental risks associated with invasive species, oil spills and cyclones through incident response plans
- marine wildlife protection, including go-slow zones to protect dugongs and turtles from boat strike, shorebird strategies to protect migratory waders from human disturbance, and the marine wildlife stranding program which helps to inform wildlife management, compliance strategies and contributes to scientific understanding of threats to marine wildlife
- monitoring of marine and terrestrial ecosystems and species including coastal birds, turtles, island cays, seagrass and coral reefs, response of plants and animals to fire, and population levels of frogs; and assessing signs of ecosystem stress such as coral bleaching, reduced nesting success, pest insect outbreaks and algal blooms.

Naturally Queensland 2020

A review of the 2001 Master Plan in 2010 resulted in the release of an updated Draft Master Plan—Naturally Queensland 2020—released for public consultation in July 2011. This new plan evolves significantly from the 2001 plan and describes the government's approach to managing land, sea and wildlife, and the challenges that we will face over the next 10 years.

Naturally Queensland 2020 is intended to complement the Queensland Biodiversity Strategy and is the cornerstone for the business of the Queensland Parks and Wildlife Service. It responds to a much more diverse and challenging environment than the 2001 Master Plan, as evidenced in recent years by drought, floods and cyclones.

Future focus

It is important for Queensland to build on its already impressive protected area system to consolidate the capture of areas of high biodiversity values as well as provide enhanced opportunities for tourism and recreation. The government has already set an ambitious target to achieve expansion of the park estate and protected areas, but further efforts will be directed to encouraging private landholders to commit areas of high biodiversity to protection as well.

Protected areas can also be achieved through other mechanisms, such as conservation agreements on private land. However, to maximise the potential for increasing the protected area estate we need to investigate a range of tenure options with more flexibility to suit the circumstances of particular sites.

Increasing protected areas

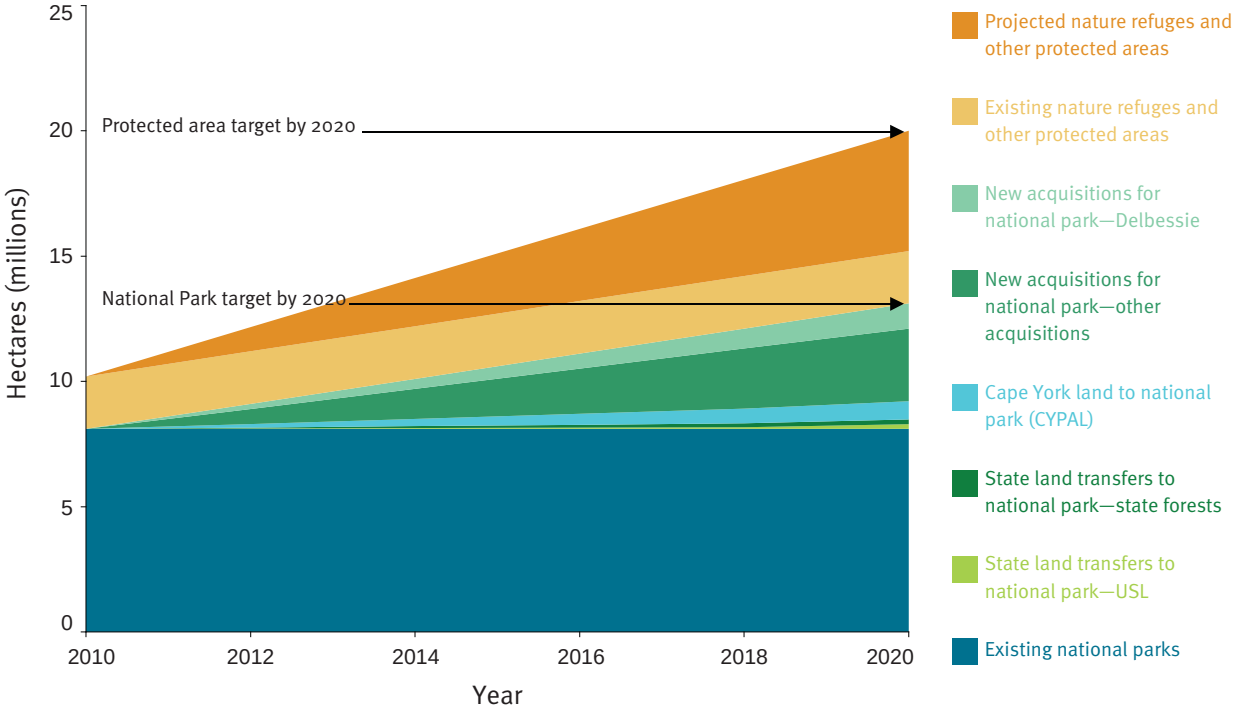
The acquisition efforts aim to achieve the Q2 target of 7.5 per cent of the state protected in national parks by 2020 and achieve maximum representation of biodiversity values, while adhering to the guiding principles for selection.

Figure 5 on page 33 shows how these targets can be achieved and demonstrates the importance of the continued expansion of nature refuges and the transition of leasehold land to national parks under the Delbessie arrangements.

By establishing and managing a comprehensive, adequate and representative system (CAR) of protected areas on land and sea, we can build areas that are resilient to climate change and other threats, managed in partnership with Aboriginal and Torres Strait Islander people, and with the involvement of an informed and participating community.

A protected area system built on CAR and supported by connectivity will allow species or ecosystem ranges to expand or change.

Figure 5. Projected increases in protected areas



Aboriginal and Torres Strait Islander partnerships

Aboriginal and Torres Strait Islander tourism ventures, the protection of cultural sites and the enhancement of Indigenous participation in park tourism and management will help to meet the goals of the 'Close the Gap' commitment. This will provide jobs for Indigenous people, improve local economies and recognise the rights and aspirations of Aboriginal and Torres Strait Islander people.

Partnerships with local communities and industry

Stronger and more cooperative relationships with local communities and industry, including park neighbours and fishers in the marine parks, will be vital in working toward whole-of-landscape management. This will ensure better outcomes for protected areas and for sustainable management on adjacent lands. More emphasis will be placed on the role and profile of protected area staff in local communities. Mechanisms will be explored for involving or contracting neighbours in aspects of park management, from fence maintenance and weed control to small-scale ecotourism ventures.

Sustainability

World-class, innovative park management will embrace sustainable energy and water management systems, improved ecological monitoring, effective visitor data systems, and state-of-the-parks reporting. Protected areas will become role models for a more sustainable 21st century lifestyle and showcase smart building design to suit Queensland's climate. This focus on sustainability will reinforce the importance of ensuring park management, visitation and tourism is sustainable. It will also reinforce state government water and energy conservation and smart building design policies.

Tourism and recreation

A nature-based tourism and recreation strategy will guide investment toward the most outstanding and iconic visitor destinations and revitalise popular parks. With the increased emphasis on special experiences, parks will provide more regional employment and leverage economic prosperity for rural communities.

Tourism opportunities on or adjacent to parks will support and complement private sector endeavours nearby, providing a better economic climate for investment in tourism.

The companion document to the Queensland Biodiversity Strategy—Protected Areas for the Future (PAF)—provides a detailed analysis of the values, principles and scientific approach to protected area selection. A revised draft Master Plan for Queensland's protected area system—Naturally Queensland 2020—was released in July 2011. When finalised, the new Master Plan will update the vision and direction for the management of the DERM-managed estate (including protected areas and State forests) and wildlife.

Together, Building Nature's Resilience: A Biodiversity Strategy for Queensland, Protected Areas for the Future and Naturally Queensland 2020 form the foundation for the whole-of-government framework for managing and protecting Queensland's precious biodiversity over the next decade.

Ecofund growing a greener Queensland

Ecofund provides product solutions and expert advice to assist government and business to meet their sustainability objectives and to support positive environmental outcomes for Queensland, through projects such as environmental and carbon offsets, energy efficiency, renewable energy and biodiverse native carbon forest development.

Ecofund assists project developers with statutory obligations through environmental offsets services and other key industries with voluntary commitments to create a low carbon future through biodiverse carbon or habitat creation projects. It can provide rural landholders with alternative income streams, and delivers on-ground conservation outcomes that expand the natural protected area estate in Queensland.

Ecofund's focus on expanding protected natural areas in Queensland ensures projects are strategically located to provide additional environmental benefits by linking, buffering and expanding existing protected areas and by enhancing ecosystems through protecting and managing land, vegetation and wildlife habitat.

ecofund queensland

Building protected areas: Priority actions

Key outcomes

- Protected areas on public and private land provide sound foundations for landscape resilience.
- Queenslanders are connected with nature.
- Marine biodiversity is better understood, protected and valued.

Strategies

1(a) Build and strengthen national parks.
1(b) Build and strengthen marine parks.
1(c) Build and strengthen other protected areas.
1(d) Build and strengthen World Heritage areas.
1(e) Manage protected areas responsibly, proactively and strategically.

1(a) Build and strengthen national parks

Target: By 2020, 7.5 per cent of Queensland, or 13 million hectares, will be protected under national park tenures.

Priority actions

1. Adopt the Protected Areas for the Future (PAF) methodology as the whole-of-government 'blueprint' for guiding new investment in national park acquisition.
2. Investigate innovative options to increase the level of private sector investment in national parks acquisitions, such as marketing specific proposals through a prospectus.
3. Identify priorities using the PAF methodology to implement the state government's five-year national park acquisitions program and pursue opportunities to leverage additional funding under the Australian Government National Reserve System program for Queensland park acquisitions.
4. Work in collaboration with the Australian Government to progress further land acquisitions and associated land management outcomes under the Cape York Tenure Resolution process.
5. Complete the remaining North Stradbroke Island national park conversions and associated Indigenous land-use and management agreements.
6. Continue to transfer identified areas to national park tenure under the South East Queensland Forests Agreement and the Statewide Forests Process and review progress in 2012 to identify all outstanding actions to ensure the project timetable is being met.
7. Optimise opportunities for securing future national park acquisition under the Rural Leasehold Land Program (Delbessie Agreement).
8. Identify areas of Unallocated State Land (USL) with high conservation values and transfer them directly to the protected area estate.
9. Establish a new strategic mechanism to systematically review relevant government property dealings such as land disposal against the PAF methodology to ensure that opportunities for meeting the Q2 national parks target are optimised.
10. Work in partnership with Ecofund to implement the guiding principles of the PAF methodology in land purchases and other biodiversity related decision making processes.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1(b) Build and strengthen marine parks

Target: By 2020, an expanded network of border to border marine parks will be established.

Priority actions

1. Update the PAF methodology to address freshwater and marine ecosystem conservation.
2. Continue to work with the Australian Government to investigate options for a marine park system in the Gulf of Carpentaria in consultation with Indigenous Traditional Owners and local communities in the southern Gulf and western Cape York Peninsula.
3. Review the Australian Government's Marine Bioregional Plan and marine reserve network proposal for the North Marine Region to assess how effectively they support the conservation of the region's marine biodiversity and maintenance of ecosystem health.

1(c) Build and strengthen other protected areas

Target: By 2020, the total area of Queensland in the protected area estate will be 20 million hectares.

Priority actions

1. Adopt the PAF methodology as the whole-of-government 'blueprint' for guiding government investment under the Nature Refuges Program and for other protected areas outside national parks.
2. Continue to support the declaration of nature refuges by providing incentives and support to landholders entering into perpetual conservation agreements.
3. Facilitate Indigenous land access agreements on leasehold land as a component of existing processes through the Delbessie program, including retaining at least one full-time equivalent dedicated support position in Department of Environment and Resource Management.
4. Cooperatively establish nature refuges on Aboriginal freehold land through continued commitment to the Cape York Tenure Resolution process.
5. Investigate a range of tenure options to identify opportunities to provide more flexibility for managing Queensland's biodiversity values.

1(d) Build and strengthen World Heritage areas

Target: By 2020, all natural areas in Queensland identified as suitable for World Heritage listing have been nominated with the support of affected landholders and suitable management regimes are in place for declared areas.

Priority actions

1. In consultation with the regional community, Traditional Owners and key stakeholders, develop the nomination of the recognition of Cooloola in the Fraser Island World Heritage Area for submission to the Australian Government and UNESCO by mid-2011.

2. In partnership with the Australian Government finalise documentation (including the proposed management regime) for the nomination with the consent of Indigenous Traditional Owners of suitable areas of Cape York Peninsula for World Heritage listing for both natural and cultural values.
3. Negotiate with the Australian Government to ensure the Caring for Our Country program and/or any successive program includes a dedicated component to support the management of Queensland's World Heritage areas in accordance with our shared international obligations.
4. Work in partnership with the Gold Coast City Council and the Department of Local Government and Planning to ensure a suitable planning and management regime is established to protect, manage and present the values of the Springbrook World Heritage Area—within the context of the wider Springbrook community.

1(e) Manage protected areas responsibly, proactively and strategically

Target: By 2020, all protected areas in Queensland are managed in accordance with defined standards which equal or better the best international practice.

Priority actions

1. Finalise the Naturally Queensland 2020 revised Master Plan for Queensland's Protected Area System to establish a long-term vision and key goal areas for Queensland Parks and Wildlife Service, supported by a strategic plan that outlines key targets for protected areas, forests and wildlife management.
2. Ensure the finalised plan provides a dynamic blueprint that is responsive to emerging issues while establishing clear directions; informs the stewardship and management of protected areas, forests and wildlife into the future; and includes an implementation plan. The final Master Plan will address:
   - the management and maintenance of biodiversity
   - joint management and other partnerships with Aboriginal and Torres Strait Islander people in protected area, forests and wildlife management
   - marine and terrestrial protected areas
   - the management of wildlife, wildlife–human interactions and threatened species
   - management of State forests
   - climate change impacts
   - a framework for management evaluation and effectiveness to inform and increase adaptive management of protected areas.
3. Develop guiding principles for managing marine parks.
4. Undertake an audit of the Nature Refuge Program to:
   - evaluate the effectiveness of the outcomes against program objectives
   - to identify any emerging medium to long-term management issues
   - to assess levels of satisfaction and management compliance of landholder parties to conservation agreements
   - identify mechanisms for regular program review and evaluation.
5. Work with Traditional Owners and key stakeholders to develop options for low-impact facilities to support public access and use of suitable parts of the East Trinity Conservation Park and pursue funding to implement an agreed proposal.
6. Build the resilience of critical ecosystems in parks and forests through improved fire management strategies developed through the ClimateQ Improved Fire Management in National Parks initiative. This initiative will contribute to the understanding of fire management adaptation requirements in the context of anticipated climate change.
7. Deliver a management planning framework for all protected areas based on adaptive management principles with a focus on priority protected areas.

1.2 Conserving species

2020 Targets

By 2020

- recover or reduce further declines for at least 10 priority species
- establish a minimum of three viable populations for at least five of Queensland's iconic species with population levels considered to be 'at risk'
- prevent the decline of common species with no additional species being classified as threatened
- there is a net increase in the health of degraded ecosystems and habitat as measured against 2010 levels.

Why do species matter?

Species are the basic building blocks of ecosystems and ongoing evolution which is why every species matters. An ecosystem is a biological environment consisting of all the organisms living in a particular area, as well as all the non-living, physical components of the environment with which the organisms interact, such as air, soil, water and sunlight. The entire array of organisms inhabiting a particular ecosystem is called a community.

Ecosystem services are the fundamental life-support services upon which human civilisation and well-being depends and can be direct or indirect. Examples of direct ecosystem services are pollination, wood and erosion prevention. Indirect services could be considered climate moderation, nutrient cycles and detoxifying natural substances. Species are essential for maintaining ecological processes and ensuring ecosystems continue to function and provide these valuable services.

Conserving species is therefore vital to ensuring ecosystems are resilient and able to adapt or respond to change.

An integrated approach to species conservation and recovery includes the statutory process of listing species considered to be at risk, and the development and implementation of species recovery plans, conservation plans and other regulatory tools. This has resulted in some notable successes, for example, the northern hairy-nosed wombat and loggerhead turtles.

Back on Track—a regional approach

More recently, the Back on Track Species Prioritisation Framework has been developed as a partnership between the state government, rural and regional industry and community groups. The framework was to be implemented and primarily coordinated through regional natural resource management (NRM) organisations across the state.

Species prioritisation under the Back on Track methodology is based upon a species' performance against the following criteria:

- probability of extinction
- consequences of extinction
  - ecological redundancy—whether it is a keystone species
  - endemicity—how endemic the species is to Queensland
  - social values—value of the species to the community

- potential for successful recovery
  - knowledge of threatening processes for the species
  - capacity to affect recovery by controlling threatening processes
  - need for ongoing management.

By prioritising efforts this framework aims to increase the capacity of government, industry and communities to focus action and investment on protection and recovery of threatened species. It outlines the key threats and actions needed in regions throughout the state to arrest decline and reduce negative pressures on terrestrial, aquatic and marine species.

The challenge now is to adopt a more strategic and effective approach to species conservation and to take urgent action where species are most at risk and where these actions will deliver better biodiversity outcomes.

More information on the Back on Track program, including the species prioritisation methodology, can be found on the Department of Environment and Resource Management website.

The Back on Track Species Prioritisation Framework will be a useful tool to inform identification of priority species including keystone species and iconic species under the strategy.

Iconic species

Iconic species are species with identified inherent social and cultural value. Making sure these species can survive into the future is fundamentally important for all Queenslanders. Iconic species in Queensland include, among others, the northern hairy-nosed wombat, cassowary, koala, bridled nailtail wallaby and bilby.

These species—such as the cassowary—can be economically important with much of the tourism in Queensland being focused on our unique natural assets. Cherished for their particular characteristics, many iconic species also play a significant role in the traditional custom and culture of Aboriginal and Torres Strait Islander communities and, like all species, are recognised for their own intrinsic value.

Partnering for the northern hairy-nosed wombat

Inland Central Queensland's Epping Forest National Park (Scientific) was created in 1974 to conserve the habitat of the last known remaining colony of one of the world's rarest species—the northern hairy-nosed wombat. The endangered northern hairy-nosed wombat colony has since been threatened by predation from wild dogs and is at risk of extinction from a major flood or disease. Actions to reduce the threats at Epping Forest National Park (Scientific) have included building a predator fence to exclude wild dogs. The last census indicated there were about 138 individuals left in the colony, which has grown from an estimated 35 animals.

A second colony was needed to reduce the risks inherent to a single colony. A second site was selected near St George based on suitable soil and vegetation characteristics near historical records of the species.

The owners of the property have entered into a Nature Refuge Agreement (The Richard Underwood Nature Refuge). The Queensland Government Nature Refuge Agreement is perpetual and will bind successive owners of the land to the arrangement. The establishment of the second colony has been funded by a sponsorship through the Xstrata Community Partnership Program Queensland. Xstrata have recently extended the sponsorship for a further two years. The infrastructure associated with the second colony includes a house, predator-proof fence and water stations.

In July 2009, the first of the northern hairy-nosed wombats were reintroduced to the nature refuge.

Partnering for the northern hairy-nosed wombat—continued

Over 2009 and 2010, 15 animals were reintroduced. The reintroduction survival rate has been high and, as of May 2011, 10 of those animals have survived. Whilst autopsies did not reveal the cause of death, stress from the translocation was unlikely due to the length of time before they died and their good body condition at the time of death.

In October 2011, two joey wombats were captured on film emerging from their burrows. These joeys were conceived at Richard Underwood Nature Refuge and herald the success of the program.

While biodiversity conservation has traditionally focused on the management of threatened species, some common species may also be declining. In many instances the collapse in populations of these common species could have a much more dramatic effect given their critical roles in structuring ecosystems and maintaining ecosystem function. That is why this strategy includes a policy focus on maintaining the current conservation status of common species.

Maintaining the momentum of existing management actions and strategies is needed to continue to improve species protection and recovery.

Disaster recovery

The Department of Environment and Resource Management (DERM) has developed processes and procedures for dealing with the impacts on wildlife of natural disasters such as flood and cyclone events.

Terrestrial

For example, in 2011 DERM implemented its disaster response framework to assist cassowaries and mahogany gliders recover from the effects of Cyclone Yasi, which struck the Queensland coastline in February 2011.

Large areas of both cassowary and mahogany glider habitat were destroyed by Cyclone Yasi. One serious effect which resulted from this was the reduction of fruit from rainforest trees—the main source of food for cassowaries. DERM, through the Queensland Parks and Wildlife Service (QPWS), immediately set up a Cassowary Response Team to work with the community to develop a coordinated response and fully assess the damage to important cassowary habitat. As a key part of the response, feeding stations have been set up and food drops were undertaken to supplement the cassowaries' diet.

Similarly, the cyclone stripped vegetation, reducing food sources and the hollow limbs where mahogany gliders live. DERM is working with the Wildlife Preservation Society of Queensland (WPSQ), RSPCA and the Kennedy, Cardwell and Ingham communities. Girringun Rangers and Traditional Owners from the area are working alongside QPWS rangers undertaking recovery actions for the mahogany glider.

The department worked closely with regional NRM groups to revegetate areas affected by the 2010–2011 natural disasters—areas with high conservation value and key areas important for landscape connectivity—to support improved ecosystem resilience. Better systems are being designed for the future to minimise impacts on the natural environment that can result from the need for emergency works. By engaging the regional NRM groups and various Landcare and community group networks to complete this task, local communities and industries are empowered to help themselves recover from disasters.

Marine

The department also worked closely with marine experts to tackle the ongoing issue of marine strandings along the coast after Queensland's devastating floods and cyclones in 2011.

Scientists believe the health of seagrass beds along much of the Queensland coast was adversely affected by floodwaters, with low salinity and high turbidity killing off seagrasses. This, in turn, leads to poorer nutrition among the dugong and turtle populations which rely on seagrass as a key food source, resulting in higher-than-average mortality.

There were over 850 reported turtle strandings along the Queensland coast in the 8 months to the end of August 2011, compared with around 500 in the same period in the previous year. Dugong deaths in the same period to the end of August 2011 were around double the rate compared with the previous year, with 127 deaths recorded compared with 64 in 2010.

Although these numbers are high, the population outlook for turtles and dugongs is unlikely to be significantly affected in the longer term by these events as long as seagrass beds are able to recover.

Nevertheless a key action to support resilience in the wake of major natural shocks such as floods and cyclones is to review the full range of other pressures on nature and certain species. In particular, this will identify what additional actions may be required even in the short to medium term to support the maintenance and recovery of species under threat.

Future focus

Through a whole-of-landscape approach that focuses on functional diversity, we can better preserve common species while also building resilient ecosystems for species at risk. Scope exists to update and re-focus legislation to a whole-of-landscape approach to species conservation and recovery.

Scientific advice is critical to informing the future of species conservation in Queensland. For example, in 2011 the government established a scientific panel to investigate deaths of a number of turtles and dugongs in waters off Gladstone. By undertaking necropsies and drawing on the advice of the scientific panel, the department will be better informed about actions necessary for the future conservation of these important marine animals.

Prioritising the allocation of available resources, by clearly identifying the value, biodiversity benefit and probability of success, will achieve the greatest biodiversity outcomes or conservation returns for threatened species.

Keeping common species common

Few Queenslanders have heard of mammals such as spotted-tailed quolls, chestnut dunnarts, kowaries and kultarrs, let alone seen them in the wild. These are some of 61 endangered, vulnerable and near threatened terrestrial and marine mammals in the state.

While restoration of vulnerable and endangered species is critical and must continue, gains to biodiversity from keeping our common species common will be immense.

We want to protect as many varieties of plants, animals and land- and sea-scapes as possible right across the state—from the sea to the desert and from the tropics to the cool southern highlands. We need to conserve not only the coral reefs, rainforest giants, bright wildflowers, most attractive animals and scenic landscapes, but also the more subtle and less glamorous places, the rarely seen and less ‘cute and cuddly’ wildlife, the prickly plants, and dull flowers.

Conserving species: Priority actions

Key outcomes

- Greater protection of species and their habitats.
- At risk species populations are stabilised or recovered.

Strategies

2(a) Secure priority threatened species through targeted conservation action and innovative management approaches.

2(b) Protect Queensland's iconic species.

2(c) Keep common species common through early detection and intervention.

2(d) Recognise that the health of ecosystems and habitat is essential to the health and abundance of species populations.

2(a) Secure priority threatened species through targeted conservation action and innovative management approaches

Target: By 2020, recover or reduce further declines for at least 10 priority species.

Priority actions

1. Request the Biodiversity Joint Ministerial Advisory Committee give priority to determining the methodology for identifying the 10 priority species, using the Back on Track methodology as a key input with an emphasis on keystone species and species of cultural importance. #
2. Implement landscape-wide 'flagship projects' that target cost-effective on-ground actions for threatened species habitat protection and threat reduction.
3. Develop a prospectus of potential investment opportunities to attract corporate and philanthropic investment.
4. Finalise and implement the review and amendment of legislation relating to marine mammals in Queensland under the *Nature Conservation Act 1992*, including a supporting marine mammal management program.
5. Use findings from the 2011 research on turtle, dolphin and dugong deaths to inform future protection measures.
6. Continue to monitor threatened species and populations and review the effectiveness of action. #
7. Work with the Australian Government on the proposed establishment of a single national list of threatened species.

2(b) Protect Queensland's iconic species

Target: By 2020, establish a minimum of three viable populations for at least five of Queensland's iconic species with population levels considered to be 'at risk'.

Priority actions

1. Identify and monitor threatened iconic species populations and review and implement recovery actions in consultation with the Biodiversity Joint Ministerial Advisory Committee. #
2. Identify, protect and, if necessary, restore priority habitat for species of iconic and cultural importance.
3. Develop a prospectus of potential investment opportunities for iconic species to attract corporate and philanthropic investment.
4. Develop and implement a Cassowary Rescue Plan in collaboration with key stakeholders in the Mission Beach area.

2(c) Keep common species common through early detection and intervention

Target: Prevent the decline of common species with no additional species being classified as threatened[1].

Priority actions

1. Identify 'indicator' common species and establish baseline data and an assessment and response framework. #
2. Develop a response strategy, including education and an implementation plan, in cooperation with the Queensland community. #
3. Ensure lists of indicator species are maintained and updated on a regular basis.
4. Ensure the indicator species framework is reviewed on a regular basis.

2(d) Recognise that the health of ecosystems and habitat is essential to the health and abundance of species populations

Target: By 2020, there is a net increase in the health of degraded ecosystems and habitat as measured against 2010 levels.

Priority actions

1. Undertake an audit of Queensland legislation relevant to biodiversity protection, including the *Nature Conservation Act 1992*, and identify opportunities to incorporate an ecosystem-based approach to the protection of biodiversity.
2. Ensure that strategic pest and fire management for the protected area estate supports species and habitat protection.
3. Work with NRM bodies to ensure Back on Track species priorities are incorporated into regional NRM investment plans.
4. Engage with NRM bodies and other community stakeholders to regularly review information used for the Back on Track Species Prioritisation Framework.
5. Ensure nature refuges and Delbessie Land Management Agreements protect threatened species and provide vital habitat for common species while allowing compatible and sustainable land uses to continue.

1 Due to a decline in actual population numbers

\# Actions to be referred to the Biodiversity Joint Ministerial Advisory Committee (refer section 2.3)

1.3 Managing extent, condition and connectivity

2020 Targets

By 2020

- the area of fragmented landscapes and aquatic ecosystems being restored to improve ecological condition has increased based on 2010 levels
- protection of biodiversity values is a central consideration of biosecurity risk assessment and response
- assessments are completed on 70 per cent of leases subject to the Delbessie renewal process and biodiversity values have been protected by Land Management Agreement conditions or inclusion in the protected area estate
- Indigenous cultural use and values are integrated into biodiversity planning, conservation and natural resources management
- connectivity and ecological condition of currently degraded corridors has improved in five corridors of local, regional or state-scale corridors identified as significant for climate changes adaptation and biodiversity recovery.

For Queensland, conserving biodiversity depends on maintaining or restoring both high levels of extent of the ecosystems across the state as well as the condition and connectivity of those ecosystems. Connected ecological and evolutionary processes help ecosystems survive, supporting flows of clean water or movement and migration of plants and animals.

The extent of Queensland's biodiversity has been affected by past vegetation clearing which has left approximately 28 per cent of Queensland's terrestrial area fragmented, in some cases heavily reduced and fragmented. In aquatic environments, the extent of many ecosystems has been significantly reduced through damming of rivers or dredging and trawling of the ocean floor.

The condition or health of the remaining 72 per cent of terrestrial environment, while appearing intact, is declining in many areas as a result of a range of threats including the spread of exotic pest species, changes to fire regimes and the effects of grazing.

Ecological health is also declining in freshwater and marine environments, in part because development and human activities on land have a flow-on effect to waterways and oceans, but also because we have a direct influence on these environments through activities such as water extraction and fishing.

Unsustainable use of resources is a major way that ecosystem condition is lost, and these problems can have flow-on effects to other connected ecosystems.

For marine and freshwater environments, water quality, particularly in relation to run-off from rural and urban development, remains a significant influence on ecosystem health.

To manage and improve ecosystem extent, condition and connectivity it is critical to consider key threats to ecological processes. It is also important to consider all the different connections because what happens in one system can affect the health of interconnected systems.

Consequently, maintaining or improving extent and condition of ecosystems does require a broader approach than the declaration of land as part of the protected area estate. Managers on the land and sea also make significant contribution to the maintenance of biodiversity when management practices help maintain or improve the condition of remaining ecosystems (such as remnant vegetation) under their stewardship. Leaders in sustainable management practices support the ecosystem processes that in turn support viable and profitable industries.

Grazing land management

Grazing land management is a regionally customised program to help graziers improve their land condition. This in turn can increase profits and improve environmental sustainability. The program was developed in 2002 and is being delivered in partnership with government, industry and regional NRM groups. The program helps graziers to understand the relationship between pasture, water, soils, woodlands, biodiversity, fire and weeds.

To date over 1400 property managers have undertaken training. Through this workshop graziers gain the tools and knowledge to develop and implement a grazing management plan on their own property. Managers learn the skills to assess the suitability of different pasture development options and determine the financial impact of a range of grazing land management options.

Management of grasslands or woodlands to optimise livestock production (that is, matching stocking pressure to available forage) also increases biodiversity outcomes. This is a win/win that provides for a sustainable landscape.

The historic Delbessie Agreement

Queensland's Delbessie Agreement (State Rural Leasehold Land Strategy) contributes to the management of biodiversity by establishing a framework for the sustainable use of rural leasehold land.

Signed in December 2007 by the Queensland Government, AgForce Queensland and the Australian Rainforest Conservation Society at Delbessie, a property near Hughenden, the agreement provides for the sustainable use of rural leasehold land and identifies appropriate management of biodiversity values including identification of areas suitable for protection as future conservation areas.

In implementing the agreement, DERM has developed a suite of practical measures to achieve sustainable land management, including guidelines for assessing rural leasehold land condition that build on the principles of the *Land Act 1994*, including the statutory duty of care and provisions relating to land degradation.

State rural leasehold land covers about 63 per cent of Queensland (mostly in the north and the west), and is land for which leases have been issued for pastoral, grazing or agricultural purposes. The agreement links the protection of conservation values—such as through the establishment of nature refuges—and Indigenous access to an extension of the term of leases.

Corridors are critical

Corridors in the terrestrial landscape are a useful concept for understanding the different scales of connectivity across landscapes and through time.

For example, small-scale corridors at a local level may help ensure that animals can move between patches of remnant vegetation on a day-to-day basis, and these corridors link in a complex web across the landscape.

Corridors at a regional and state-scale support broader scale and often long-term processes such as important flows of water through the landscape, seasonal migration of animals or the flow of genes between populations of plants.

In Queensland, corridors are identified where significant connected tracts of natural vegetation remain, or in the more fragmented parts of our landscapes, where biodiversity conservation will significantly benefit if natural habitats are restored.

Riparian corridors are also important in Queensland, where maintaining the condition of vegetation surrounding waterways both protects important habitats and can help maintain the quality of aquatic ecosystems.

Identification of areas of significant connectivity value, such as corridors, can help governments, natural resource managers, non-government organisations and other individuals to focus their conservation efforts and investment to achieve a greater collective effect for biodiversity conservation.

Different scales of corridors

Corridors have already been identified at many scales in Queensland—bioregional, regional and local. Notional locations of state-scale conservation corridors have been described across Queensland and are shown in **Map 2** on page 48. Mapping of corridors at this scale, while not endeavouring to identify specific on-ground locations, indicates broad links in the landscape that can assist planning for voluntary collaboration of government, NRM groups and landholders for restoration and conservation efforts.

Both inside and outside of identified corridors, voluntary efforts are extremely important for protecting areas of high biodiversity value and improving degraded areas on individual properties, including through nature refuges and revegetation projects.

Firm foundations

Over the last 10 to 15 years, government has introduced programs that aim to improve extent, condition and connectivity of ecosystems, including the Vegetation Management Framework, Delbessie Agreement, South East Queensland Forests Agreement, Statewide Forests Process, Queensland Wetlands Program, the Reef Protection Package, protected areas and nature refuges and regional plans.

The recently released revised Queensland Coastal Plan has identified areas of high ecological significance (HES) in the coastal zone and planning and development policies that will contribute to the protection of biodiversity values in HES areas. It will also incorporate recognition of marine areas with high ecological significance by mirroring values identified in existing marine park plans.

In addition, the non-government sector, including regional NRM bodies, Greening Australia, Australian Wildlife Conservancy, Bush Heritage, Australian, Rainforest Conservation Society, WWF-Australia and The Nature Conservancy has invested significantly in biodiversity.

Biosecurity

Biosecurity means mitigating the risks and impacts to the economy, the environment, social amenity or human health associated with pests and diseases.

Biosecurity is important to Queensland as pests and diseases can have a long-term impact on the profitability of our primary industries, our unique biodiversity and our way of life.

Biosecurity Queensland coordinates the Queensland Government's efforts to prevent, respond to and recover from pests and diseases that threaten the economy and environment. It plays a crucial role in helping ensure the land and the environment is healthy and resilient through:

- preventing the spread of diseases to native animals and plants, and the potential devastating impacts this may have on ecosystems
- providing a framework for management of invasive species.

Future focus

The establishment of a national carbon market in Australia is likely to provide a significant future source of investment for reforestation, which—if properly managed—represents a unique opportunity to restore biodiversity. In addition to providing a carbon sequestration benefit, restoration projects and native mixed-species plantations can also help build ecosystem resilience and can provide a range of ecosystem services.

While this presents new opportunities, there is also the risk that in the absence of complementary government policies the market will favour low-cost and high economic return monoculture plantations directly or indirectly for carbon, which may result in limited positive biodiversity enhancements. As such, the Queensland Government has developed a suite of policies to increase biodiversity outcomes from the carbon market.

For example, the Commonwealth and state governments have over recent years invested considerable effort and funding in regional NRM bodies, which develop plans for improving natural resource outcomes in their particular region. A key future focus for the government will be working with regional NRM bodies to incorporate biodiverse carbon forestry opportunities into NRM plans, and prioritising opportunities through NRM funding programs.

Information and tools are also being developed that will assist investment in biodiverse carbon forests. For example, the Queensland Government's Carbon Accumulation through Ecosystem Recovery (CATER) program will develop a new web-based information system to assist landholders to establish reforestation projects using native vegetation types. Ecofund, as well as other organisations, will help encourage participation in biodiverse carbon forestry projects in Queensland.

Underpinning these initiatives, the Queensland Government has committed to investigate options for incentives to make biodiverse carbon forestry more commercially attractive compared with monoculture carbon forestry projects.

The Queensland Government Environmental Offset Policy provides a framework for allowing offsets as a way for developments to compensate where the project has unavoidably impacted on biodiversity. In addition, the Queensland Government has recently progressed legislation to confirm offsets as a condition of development in some instances to ensure biodiversity interests are met.

A comprehensive biodiversity offset scheme has the potential to balance inevitable biodiversity losses resulting from development and growth with corresponding biodiversity gains. The State will also work with local government to introduce consistent and comprehensive complementary regulation of offset arrangements to suit their requirements.

Encouragement and facilitation of sustainable resource use, including continuous improvement of sustainable land management, on privately managed land is a significant part of both the protection of biodiversity and the long-term profitability of natural resource dependant industries, like grazing and fishing.

Managing extent, condition and connectivity: Priority actions

Key outcomes

- Stronger natural systems that can respond to threats and stressors.
- Climate change adaptation strategies are flexible and responsive to new information.
- Improved management on privately managed lands provides greater safeguards for biodiversity values and ecological integrity.
- The contribution of Aboriginal and Torres Strait Islander Traditional Owners and communities to biodiversity protection and management is supported.

Strategies

3(a) Minimise further loss of existing habitat and retain intact areas outside the protected area estate.

3(b) Manage biosecurity risks.

3(c) Protect and where necessary improve the condition of biodiversity on rural leasehold land.

3(d) Better integrate Aboriginal and Torres Strait Islander land and sea country management.

3(e) Improve ecological connectivity across landscapes and seascapes.

Map 2. Statewide conservation corridors

3(a) Minimise further loss of existing habitat and retain intact areas outside the protected area estate

Target: By 2020, the area of fragmented landscapes and aquatic ecosystems being restored to improve ecological condition has increased based on 2010 levels.

Priority actions

1. In cooperation with local councils, industry organisations, graziers and the conservation sector, finalise reforms to the state's stock route network to protect its transport function and biodiversity values for the benefit of future generations including:
   - developing a web-based Stock Route Management System to support local governments to implement proposed changes to the network's management
   - implementing management arrangements to protect the significant biodiversity values throughout the network while ensuring the continued availability of the stock route for travelling stock.
2. Ensure priority biodiversity outcomes are adequately incorporated into the State Priorities Investment Strategy for Q2 Coasts and Country in consultation with relevant stakeholders.
3. Maintain the total extent of remnant vegetation across Queensland above 138 million hectares (approximately 80 per cent of the total state area of 173.14 million hectares) and also maintain suitable systems to monitor changes to this extent.
4. In cooperation with NRM bodies, local government, community groups and landholders, facilitate cost-effective ecological restoration programs based on assisted natural regeneration, where appropriate and consistent with regional biodiversity objectives.
5. Align water resource planning with water quality regulatory standards to ensure connectivity between stream flows and key aquatic ecosystem processes.
6. Continue to implement the program of declarations of wild rivers in Western Queensland and Cape York Peninsula.
7. Implement amendments to the *Forestry Act 1959* and the *Land Act 1994* to give greater certainty to lessees regarding their rights to derive benefits from carbon associated with additional protection of native regrowth vegetation.
8. Develop the Carbon Accumulation Through Ecosystem Recovery (CATER) program to provide information on carbon storage potential and growth rates of native regrowth vegetation to landholders to support restoration projects using native vegetation.
9. Develop mechanisms that will support investment in biodiverse carbon forestry including complementary information, tools and regulation, and market-based incentives in response to an emerging carbon market.
10. Work with the Australian Government and landholders to maximise benefits for biodiversity from participation in the Commonwealth Carbon Farming Initiative.
11. Support Ecofund to adopt a strategic approach to becoming a key player in the carbon biosequestration industry through participation in Queensland-based biodiverse carbon forestry projects.

3(b) Manage biosecurity risks

Target: By 2020, protection of biodiversity values is a central consideration of biosecurity risk assessment and response.

Priority actions

1. Better articulate biodiversity values and priorities and ensure incorporation in biosecurity risk management processes.

2. Ensure Local Government Pest Management Plans provide biosecurity and biodiversity outcomes.
3. Develop a framework for integration of biodiversity interests in:
   - biosecurity research programs
   - risk management and response planning to manage the effect of diseases on native animals, plants and ecosystems
   - partnerships between local government and the State in prevention and management of pest species and diseases.
4. Improve information access and sharing arrangements to enhance capacity and capability for integration of biodiversity interests in biosecurity decisions.

3 (c) Protect and where necessary improve the condition of biodiversity on rural leasehold land

Target: By 2020, assessments are completed on 70 per cent of leases subject to the Delbessie renewal process and biodiversity values have been protected by Land Management Agreement conditions or inclusion in the protected area estate.

Priority actions

1. Undertake a review of the State Rural Leasehold Land Strategy (Delbessie Agreement) to evaluate the effectiveness of the implementation to date in relation to biodiversity, landscape health and productivity. A steering committee of key stakeholder representatives will be established to advise the Minister responsible for the Delbessie Agreement on the review.#
2. Enhance the capacity of leasehold land managers to avoid duplication of effort in managing for biodiversity by integrating the requirements of other government programs with Delbessie Land Management Agreements.

3(d) Better integrate Indigenous land and sea country management

Target: By 2020, Aboriginal and Torres Strait Islander cultural use and values are integrated into biodiversity planning, conservation and natural resources management.

Priority actions

1. Investigate opportunities to provide financial assistance for core operations of regional Aboriginal and Torres Strait Islander owned and operated NRM organisations involved in land and sea country management, including consideration in any future NRM program to follow Q2 Coasts and Country.
2. Ensure Aboriginal and Torres Strait Islander land and sea country management is an integral component of any proposed management framework for the proposed Cape York Peninsula World Heritage Area.
3. Continue to support Traditional Owners and Indigenous members of the North Stradbroke Island community to work with the Queensland Parks and Wildlife Service and other relevant agencies to exchange skills and build capacity of individuals and families to participate in culturally based land and sea management as part of the government's North Stradbroke Island package.

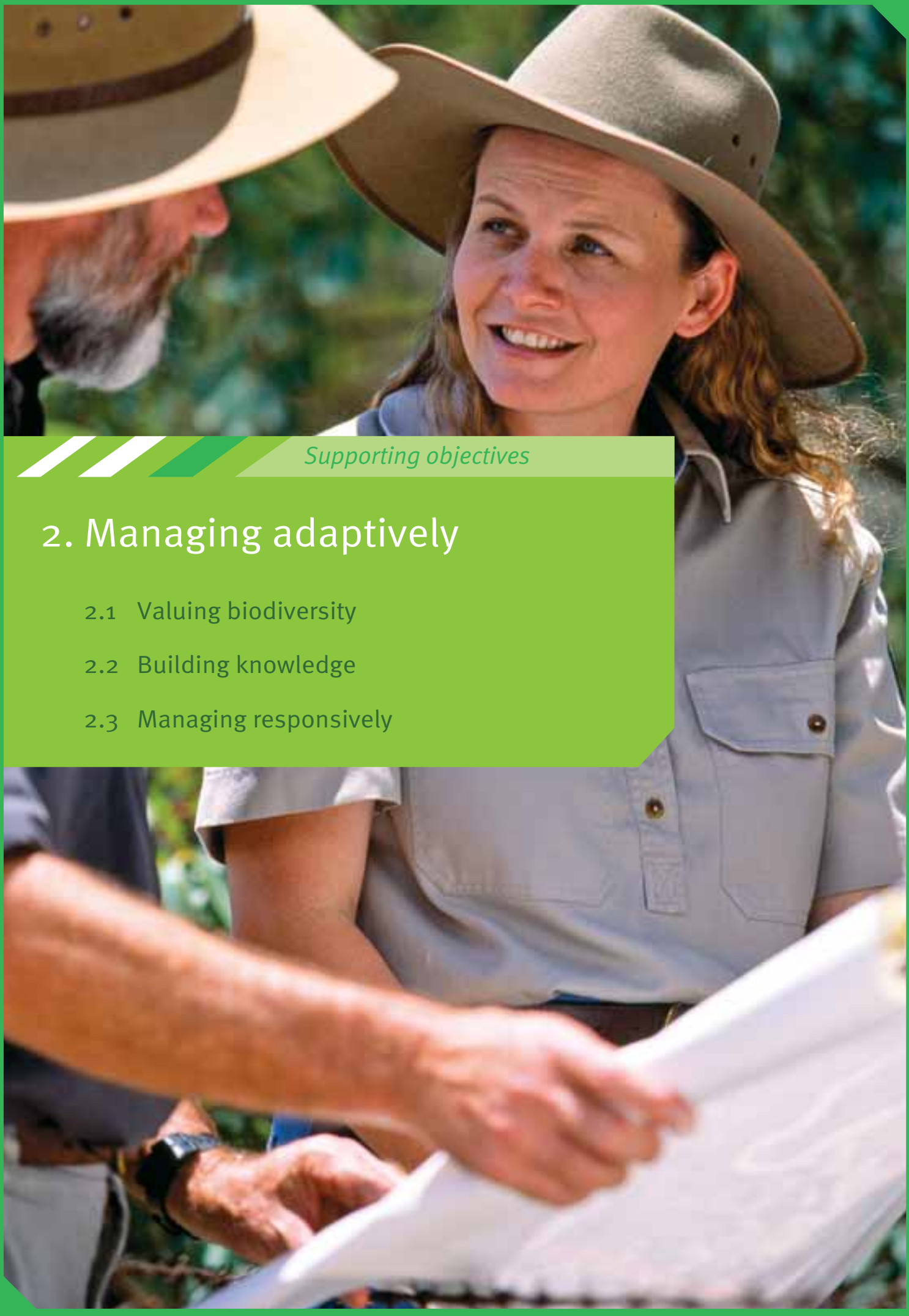
3(e) Improve ecological connectivity across landscapes and seascapes

Target: By 2020, functional connectivity and ecological condition has improved in five currently degraded corridors identified as significant for climate change adaptation and biodiversity recovery at the local, regional or state-scale.

Priority actions

1. Identify priority corridors and develop sufficient information to inform biodiversity-related investment decisions.#
2. Implement a small grants program through the Q2 ClimateSmart Climate Change Corridors for Biodiversity to build connectivity and encourage habitat resilience to climate change.
3. Investigate opportunities for potential incentive programs and/or regulatory mechanisms to prevent further loss and fragmentation of corridors, particularly riparian corridors, and to encourage rehabilitation effort.#
4. Promote a focus on the repair and rehabilitation of biodiversity corridors in the implementation of carbon sequestration programs.

Actions to be referred to the Biodiversity Joint Ministerial Advisory Committee (refer section 2.3)



Supporting objectives

2. Managing adaptively

2.1 Valuing biodiversity

2.2 Building knowledge

2.3 Managing responsively

2.1 Valuing biodiversity

The success of this strategy depends on strong community awareness, engagement and commitment to biodiversity conservation and protection of ecosystem services. Making the link between biodiversity loss and its effect on community health and quality of life will help drive the message that we have a personal obligation to act. Understanding how the community views the inevitable trade-offs between biodiversity conservation, the maintenance of ecosystem services and development will be important for increasing participation.

There is limited data available on the current level of awareness and understanding of biodiversity by Queenslanders. Recent surveys have revealed that although most Queenslanders consider the environment an important issue it ranks behind other issues considered more pressing, such as health and education.

Baseline research to establish the level of community understanding around terms such as 'biodiversity' and 'biodiversity values' is expected to highlight a limited understanding.

Testing attitudes, perceptions and understanding of biodiversity's contribution to our everyday lives will be fundamental to informing meaningful communication strategies.

If we are to achieve the strategy's vision we need to move Queenslanders from inaction to action so that the greatest impact for biodiversity conservation can be achieved.

This research will help set community standards, contribute to the development of policy and inform investment by government, industry and business.

Cultural and economic value of biodiversity

Besides its intrinsic value, biodiversity provides ecosystem services that form the natural capital of fresh and healthy water, clean air, soil fertility, shelter, food sources and biological pest control.

Biodiversity is integral to people's culture (especially for Traditional Owners), social and aesthetic values (for recreational purposes), and for economic growth through the generation of tourism income and ecosystem services.

Maintaining species diversity and ecosystem processes is critical to the stability of the earth's social and ecological systems. The natural environment provides people with food to eat and fresh water to drink. Furthermore, the monetary value of goods and services provided by ecosystems globally is estimated at US$33 trillion dollars per year.

Ecological, economic, social and intrinsic values of biodiversity underpin the drivers for economic growth, job creation and technical developments. For example, national parks are Australia's biggest tourism asset. In 2009, more than 40 per cent of all international visitors included a trip to a national park. Direct spending by tourists whose trip is specifically to visit national parks amounts to $749 million a year and contributes about $345 million a year to gross state product.

In 2006–07, the Great Barrier Reef generated more than $5 billion in tourism to the Queensland economy and provided an estimated 43 700 full-time jobs. Recreational use (including recreational fishing) had a value of $153 million in the region, and there were 14.6 million visits by local residents living in the Great Barrier Reef catchment.

Knowledge of biodiversity is still developing, so its true value may still be unknown and unrealised. It is important to learn more about how biodiversity contributes to ecosystem services, particularly soil and water systems. There are certainly food species and natural pharmaceuticals yet to be discovered. The greatest risk is that they may be lost even before their potential usefulness is recognised.

Future focus

The imperative to manage and conserve biodiversity will need to be balanced with the desire of landholders to sustainably and profitably manage their land, and for society to achieve ecologically sustainable population growth. Success will come from partnerships forged around common objectives and focused on biodiversity results.

As a platform for action, existing partnerships need to be maintained and consolidated, such as partnerships established around the Commonwealth and State NRM programs and the Great Barrier Reef Water Quality Protection plan.

Opportunities for new partnerships or to extend existing partnerships need to be identified and acted on, in particular those in the corporate sphere where additional investment may be available.

Valuing biodiversity: Priority actions

Key outcomes

- Increased community and industry understanding, participation and investment in biodiversity conservation activities.
- Strong partnerships between governments and between the Queensland Government and key industry and community sectors to support biodiversity conservation.
- Existing successful programs and activities are consolidated and sufficiently resourced.
- The contribution to the economy and society of ecosystem services and natural capital is valued and accounted for.

Strategies

4(a) Foster partnerships and cooperative approaches that recognise the shared responsibility for biodiversity conservation.

4(b) Define and quantify the economic and social values of biodiversity.

4(a) Foster partnerships and cooperative approaches that recognise the shared responsibility for biodiversity conservation

Priority actions

1. Implement biodiversity conservation education programs which include Aboriginal and Torres Strait Islander biocultural diversity and traditional knowledge components.

2. Continue to investigate partnership opportunities to progress the 'Cape York Dreaming Track' and facilitate development of sections with willing landowners.
3. Identify opportunities to maximise Queensland's share of funding under the Australian Government's proposed Biodiversity Fund.#
4. Explore a partnership with key tourism stakeholders to promote the value of national parks and protected areas to the Queensland economy in the wider community, possibly through tourist accommodation networks.
5. Expand and reinvigorate the parks volunteers program by dedicating resources to establish a network of 'Friends of National Parks' groups to encourage community ownership and involvement.
6. Foster cooperative relationships between QPWS and neighbouring landholders to build stronger support for protected areas and to develop strategic management partnerships.
7. Develop enduring relationships between the state government and the research community to deliver strong linkage between policy and science.
8. Use NRM plans to coordinate regional efforts, review effectiveness of actions and leverage investment and community support in biodiversity outcomes.
9. Collaborate with the Local Government Association of Queensland and individual local governments to deliver education and awareness campaigns on the benefits of protecting natural values (e.g. ecosystem services, mental and physical health, etc).

4(b) Define and quantify the economic and social values of biodiversity

Priority actions

1. Collaborate with the Australian Government in development of a national biodiversity account, in conjunction with broader national environmental accounting and reporting systems. #

Actions to be referred to Biodiversity Joint Ministerial Advisory Committee (refer section 2.3)

2.2 Building knowledge

The current regional ecosystem mapping data across two areas of remnant and pre-clearing provide an exceptional basis on which to build understanding of biodiversity health in Queensland. Regional vegetation mapping uses satellite imagery, in combination with recent aerial photography and field-based inspections to confirm data accuracy. These maps are of particular importance as aids in making decisions about biodiversity conservation.

The Biodiversity Assessment and Mapping Methodology (BAMM) builds on these sound foundations to provide a consistent approach for assessing biodiversity values at the landscape-scale in Queensland. The Aquatic Biodiversity Assessment and Mapping Method (AquaBAMM) has also been developed for assessing conservation values of wetlands.

More and better data

The Queensland Government maintains several databases of information to assist individuals and organisations undertake actions to conserve the state's biodiversity.

The government's Back on Track Species Prioritisation Framework assists in prioritising actions and investment to protect and recover threatened species. Biodiversity Action Plans have been developed for each NRM region to guide investment in local strategies, community capacity building and research and monitoring.

Further world-class research to better understand Queensland's biodiversity is being undertaken by a variety of research providers. Universities, CSIRO, Queensland Government departments, NRM bodies and Queensland and Australian Government research facilities, such as the Queensland Herbarium and the Australian Institute of Marine Science (AIMS), are undertaking research.

Building our knowledge with the latest thinking in biodiversity management and ensuring we have sufficient knowledge of the complex interactions of our natural systems, including their tipping points, will be fundamental to implementing this strategy.

Forging strong partnerships with research entities and providing clear and focused direction for research projects will deliver invaluable insights into biodiversity conservation.

Valuing Indigenous traditional knowledge

Aboriginal and Torres Strait Islanders have lived in and managed Queensland's land- and seascapes for tens of thousands of years. Their knowledge about biodiversity (land and sea country) is inextricably linked to their cultural practice and traditionally has been passed to successive generations.

Continuing to integrate Traditional Owners' ecological knowledge with western science will provide Queensland with a unique and invaluable perspective on biodiversity management and conservation.

Non-Indigenous knowledge about the biodiversity of Queensland has also been accumulating since Captain Cook sailed up the east coast of Queensland in 1770. Today Queensland has the benefit of sound mapping and data on regional ecosystem distribution in the state but relatively patchy information about wildlife values.

Future focus

To effectively conserve and manage biodiversity we need to continue gathering knowledge of how ecosystems and species function, and the status of current and potential threats in particular threats from climate change and its compounding effects on other threatening processes. It is therefore important that Queensland maintains a strong ecological science research base.

As we accumulate knowledge we need to ensure it is readily available to underpin sound investment and management decisions for conserving nature, and inform biodiversity conservation policies and programs.

Building knowledge: Priority actions

Key outcomes

- Decisions affecting the stability and resilience of Queensland's biodiversity are based on best available science.
- Early warning of potential impacts of climate change and other threats on biodiversity and identification of strategic responses.
- Biodiversity benchmarks and indicators inform biodiversity management practices and decisions across the landscape.
- Aboriginal and Torres Strait Islander traditional knowledge is recognised and valued for its contribution to biodiversity protection and management.
- The role of terrestrial, freshwater and marine ecosystems in the broader landscape is better understood and valued.
- Biodiversity data is accessible and used to support better policy and decision making.

Strategies

5(a) Improve knowledge and understanding of Queensland's biodiversity, including the potential impacts of climate change.

5(b) Improve information accessibility, dissemination and knowledge sharing.

5(a) Improve knowledge and understanding of Queensland's biodiversity, including the potential impacts of climate change

Priority actions

1. Update marine and estuarine habitat mapping and classification of the Wide Bay area of the Tweed Moreton Bioregion to enable more effective biodiversity protection and conservation measures.
2. Work with the Australian Government and interested Traditional Owners to investigate issues associated with ownership and management of Aboriginal and Torres Strait Islanders' culture and intellectual property with a view to better protecting the cultural integrity and use of traditional knowledge data.
3. Publish baseline marine and terrestrial bioregional reports identifying current biodiversity status and associated threats and barriers to conservation.
4. Having regard to the findings from Climate Change Impacts and Adaptation Options for Biodiversity and Ecosystems in Queensland – A Synthesis, once finalised, develop and implement priorities for adapting Queensland's ecosystems and landscapes to the impact of climate change.
5. Ensure biodiversity and ecosystem resilience are adequately addressed in Queensland's climate change adaptation responses.

5(b) Improve information accessibility, dissemination and knowledge sharing

Priority actions

1. Establish a forum for regular dialogue between government, research organisations and relevant NGOs working to deliver biodiversity outcomes.
2. Through this forum facilitate development of information priorities and flow of knowledge including incorporating new knowledge into education and extension programs and activities.
3. Improve cross-cultural information exchange between Indigenous and non-Indigenous communities, including supporting Aboriginal and Torres Strait Islanders' organisations access to scientific and technical personnel and information, and non-Indigenous scientists' understanding of traditional knowledge.
4. In consultation with regional NRM bodies, local governments, Traditional Owners and key industry, conservation and community stakeholders, the Department of Environment and Resource Management will develop a web-based biodiversity information resource that, over time, will host and share biodiversity related information, guides and resources for governments, land managers, educators, industry and communities.
5. Consult with the research community in Queensland to identify opportunities for new relationships and mechanisms to improve biodiversity conservation information management.

2.3 Managing responsively

The role of the three tiers of government is one of leadership facilitating change through policy and legislative development, and investing in incentive programs and research.

In many areas of biodiversity protection and planning governments are cooperating more than in the past.

However, the decision-making processes often remain compartmentalised, with individual governments or agencies frequently implementing policies in isolation from other government agencies. While these decisions are made with the best of intentions, better outcomes for biodiversity could be achieved if agencies coordinated their policies and actions and implemented a single broad set of policies.

New ways of operating and reporting are needed to overcome this traditional 'silos' approach and ensure the state government is able to better quantify the cumulative effects of the full range of actions that impact both positively and negatively on biodiversity outcomes.

Accountability can be improved through increased transparency of decision making within government and through the ways that the government communicates this information to the community.

This will be essential if the government is to properly measure progress toward meeting strategy actions and targets.

Managing adaptively

Adaptive management is more than good monitoring. It is a cyclic process that depends on regular planning and review of performance indicators and objectives, backed by effective research, monitoring and reporting, factoring in regular adjustment of management to deal with a constantly changing environment and high levels of uncertainty.

The model shown in **Figure 6** on page 59 illustrates the adaptive management cycle for environmental management and demonstrates the dynamic interrelationship of decision-making processes.

Much of this process is already well established and will be the subject of ongoing improvement, in particular evaluating and learning phases of the process.

Promoting the use of adaptive management across private and public sectors will mean providing access to effective and focused research and monitoring, whereby critical indicators of environmental health are central to the monitoring process.

State of the Environment reporting

The Queensland Government publishes a report on the State of the Environment (SoE report) every four years in accordance with requirements of the *Environmental Protection Act 1994* and the *Coastal Management and Protection Act 1995*. State of the Environment reporting involves the collection of a comprehensive set of environmental information to support effective evidence-based decision making.

The existing State of the Environment reporting framework for biodiversity in Queensland outlines the status of established indicators. Indicators are a critical component of environmental reporting, providing a basis from which to measure change. They can be used to identify condition and trend and provide results from monitoring and evaluation that can enhance adaptive management, facilitate evidence-based decision making and inform timely and relevant policy development.

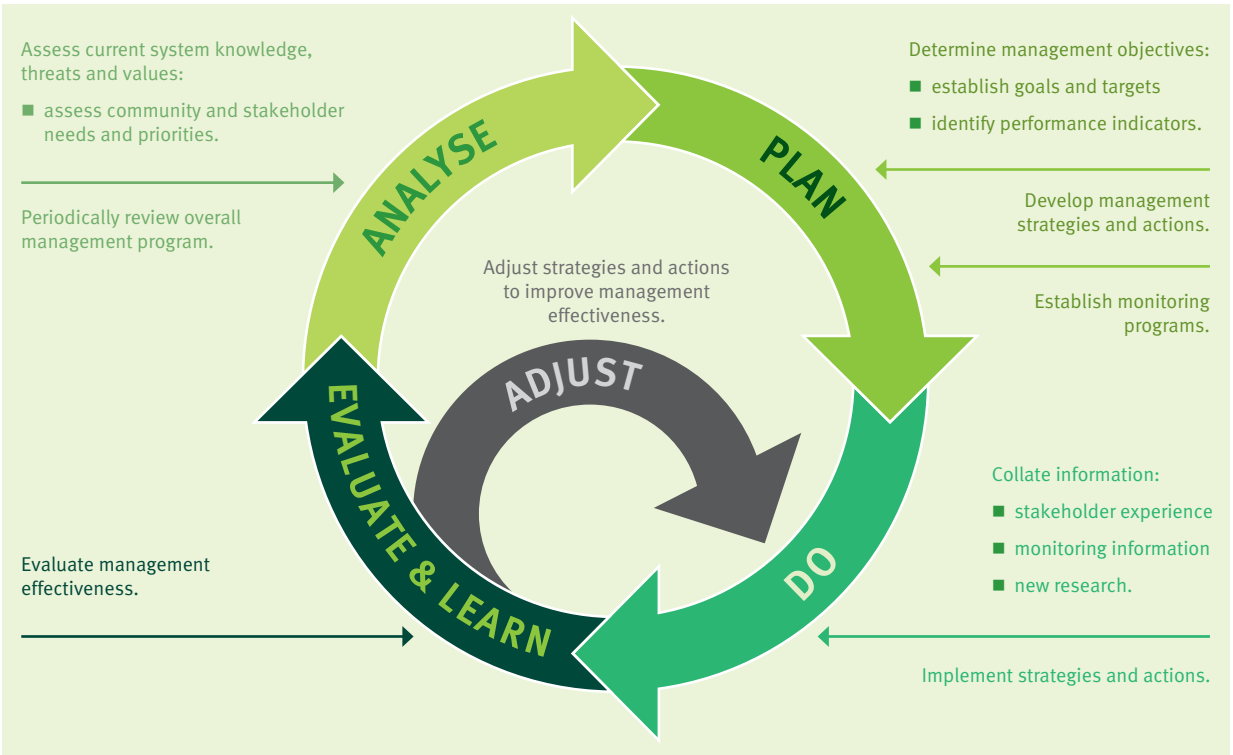
Current indicators in the State of the Environment reporting include a focus on the pressures on biodiversity, the state of biodiversity and responses to the reported situation. The reporting also outlines the key economic, political, social and environmental drivers affecting the environment in Queensland.

This approach to reporting is consistent with the widely utilised Driver-Pressure-State-Impact-Response (DPSIR) framework applied to environmental reporting nationally and internationally. This framework recognises the role of humans in environmental degradation and the capacity for society to manage these impacts.

Examples of biodiversity-focused indicators in the current state of environment reporting relate to:

- vegetation clearing
- invasive plants and animals
- regional ecosystems
- threatened species
- protected area estate
- nature refuges
- wetland extent and condition
- freshwater, estuarine and marine water quality
- aquatic ecosystem health monitoring.

Figure 6. Adaptive management cycle



N.B. Adapted from CSIRO Marine and Atmospheric Research 2009

Program-specific reporting

The Department of Environment and Resource Management also has a range of specific monitoring and reporting frameworks, including:

- The Statewide Landcover and Trees Study (SLATS) project that uses satellite imagery to record changes in ecosystem extent, especially to measure the impact of the State's vegetation management laws. The project is a major vegetation monitoring initiative which investigates the overall cover of woody vegetation and reports on the previously unquantified extent of land clearing in Queensland using scientifically developed and tested methods.
- The Reef Water Quality Protection Plan 2009 (Reef Plan 2009), which brings together people and projects to help improve the quality of water entering the Great Barrier Reef lagoon. This involves monitoring and modelling a range of attributes at a range of scales, including management practices and water quality at the paddock, sub-catchment, catchment levels and in adjacent marine areas.
- The Paddock to Reef Integrated Monitoring, Modelling and Reporting program is a key action of the Reef Plan 2009. It is designed to evaluate the efficiency and effectiveness of implementation and report on progress toward the Reef Plan (and Reef Rescue) goals and targets. The program involves the development of an annual report card on reef water quality.

Future focus

The existing State of the Environment framework will continue to be the leading government report on the state of Queensland's biodiversity over time.

Better outcomes for biodiversity, however, require more regular and detailed monitoring of key indicators against defined benchmarks for healthy biodiversity and routine quantification of impacts on those indicators to inform adaptive management.

The Department of Environment and Resource Management is responsible for the evaluation and review of this strategy and will prepare public reports on its effectiveness following the release of each State of the Environment report. The first review will be undertaken in 2016 following the release of the 2015 State of the Environment report.

New arrangements to support the implementation of the Queensland Biodiversity Strategy are also required including additional governance and reporting arrangements.

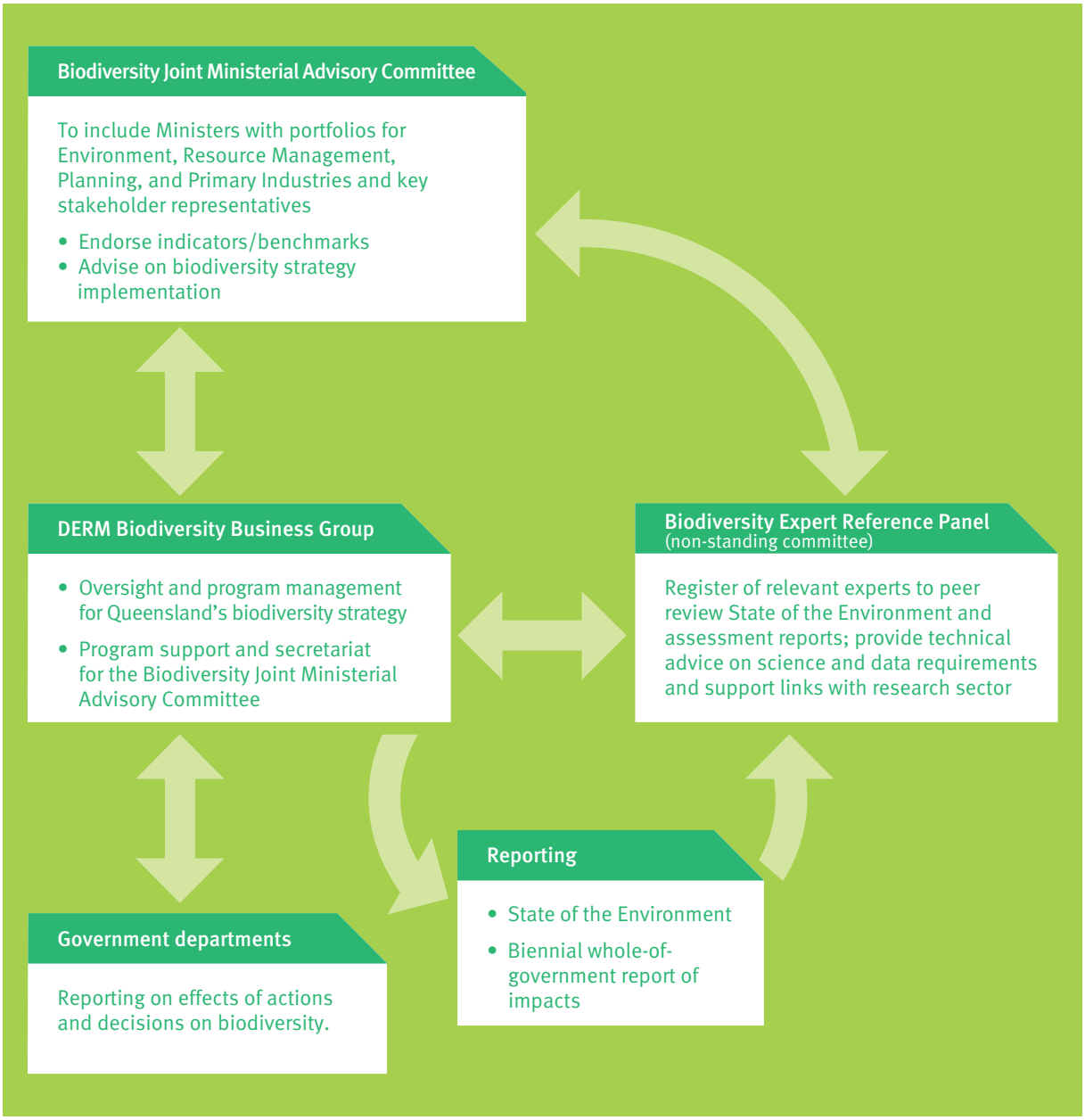
Biodiversity governance framework for Queensland

New governance and reporting arrangements to oversee implementation of the Queensland Biodiversity Strategy are represented in **Figure 7** on page 61.

Under these arrangements, biodiversity conservation will be a consideration in applicable decisions of government, and all relevant government departments will report on their responsibilities to conserve biodiversity including the effects of their actions and decisions.

This strategy identifies a list of guiding principles for the consideration of biodiversity in decision-making processes. Indicators and other measures need to be developed to operationalise these guiding principles so they can be applied in meaningful ways to the business of government.

Figure 7. Proposed Biodiversity Governance Framework for Queensland



The framework for reporting will be achieved through the State of the Environment reporting mechanism every four years and through a whole-of-government biennial report on opportunities as well as any barriers to progress of biodiversity strategy targets and outcomes.

A dedicated Biodiversity Business Group will compile the biennial and State of the Environment reports for consideration by the Biodiversity Joint Ministerial Advisory Committee and will provide oversight, coordination and reporting on implementation of actions under the biodiversity strategy.

Joint Ministerial Advisory Committee on Biodiversity

A Biodiversity Joint Ministerial Advisory Committee (JMAC) will provide advice to the Queensland Government on matters relevant to the achievement of biodiversity strategy targets and outcomes.

The Biodiversity JMAC will include Ministers with portfolios for Environment, Resource Management, Planning and Primary Industries as full-time members.

The Minister with portfolio responsibility for the Environment will chair the JMAC. Other Ministers with portfolio interests in areas such as Fisheries, Infrastructure and Mining will be invited to attend JMAC meetings where needed to address relevant policy and or biodiversity related matters.

In addition to government members, the Biodiversity JMAC will include suitably qualified non-government representatives from peak organisations whose core business includes terrestrial and marine conservation, natural resource management, agriculture, urban and regional planning and Indigenous traditional knowledge, land and sea management as well as representatives of relevant local government, development and research organisations.

The Biodiversity JMAC will provide advice to the government in relation to key aspects of the Queensland Biodiversity Strategy, including:

- priorities for implementation
- identification and monitoring of keystone, iconic and indicator common species
- identification of priority corridors and opportunities for biodiversity-related investment in protecting and restoring these corridors
- development of accounting methods, benchmarks indicators and targets for measuring and monitoring biodiversity values
- review of biennial and State of the Environment reports on biodiversity.

A Biodiversity Expert Reference Panel comprising independent experts with relevant technical expertise will provide advice to support the work of the Biodiversity JMAC.

Future focus

Through the mechanisms of the Biodiversity JMAC, improved access to expert advice and more formalised reporting systems, it is intended that biodiversity conservation will be embedded into government decision-making processes, progressively enhancing practices through adaptive management.

Learning from past experiences and being guided by expert scientific advice should help the government determine when management strategies and decision-making processes need to be reviewed and updated to support biodiversity resilience. This will become increasingly critical as the impacts of climate change become more apparent and knowledge is gained in terms of adaptation and amelioration strategies.

A greater focus on biodiversity conservation should also lead to a greater understanding of how social values influence, or are influenced by, the management of natural environment. Developing a greater appreciation of the value of biodiversity—and what society stands to lose if it is not protected—is the single most important outcome of this strategy.

Managing responsively: Priority actions

Key outcomes

- Biodiversity is maintained, managed and/or enhanced.
- Government decisions are reviewed for their contribution to the achievement of biodiversity conservation outcomes.
- Biodiversity conservation is a core consideration of state, regional and local planning strategies and development decisions.
- Monitoring systems are in place to underpin adaptive management.
- There is a coordinated approach to biodiversity conservation across all levels of government.
- Accountability for meeting biodiversity outcomes is improved.

Strategies

6(a) Monitor and review the effectiveness of biodiversity conservation programs and investments in Queensland against a set of agreed indicators and benchmarks.

6(b Improve accountability for meeting biodiversity outcomes through the establishment of a whole-of-government governance and reporting framework.

6(c) Ensure that State planning instruments are progressively reviewed, updated and developed to address the protection and management of biodiversity values.

6(a) Monitor and review the effectiveness of biodiversity conservation programs and investments in Queensland against a set of agreed indicators and benchmarks

Priority actions

1. Within 12 months develop a set of benchmarks, indicators and/or targets in consultation with a new Biodiversity Joint Ministerial Advisory Committee as the basis for whole-of-government reporting on biodiversity impacts and outcomes. #
2. Ensure alignment between benchmarks, indicators and/or targets and those used for State of the Environment reporting.
3. Work with local government and the Local Government Association of Queensland to develop agreed mechanisms to ensure that local government actions and contributions related to biodiversity are recognised and incorporated into state level reporting and monitoring.
4. Evaluate the contributions related to biodiversity of community based organisations such as NRM groups, Landcare and other regional and local NGOs.
5. Review the 2011 Queensland Biodiversity Strategy in 2016 with reference to the 2015 State of the Environment report and based on advice of the Biodiversity Joint Ministerial Advisory Committee and the Biodiversity Expert Reference Panel.#

Actions to be referred to the Biodiversity Joint Ministerial Advisory Committee (refer section 2.3)

6(b) Improve accountability for meeting biodiversity outcomes through the establishment of a whole-of-government governance and reporting framework

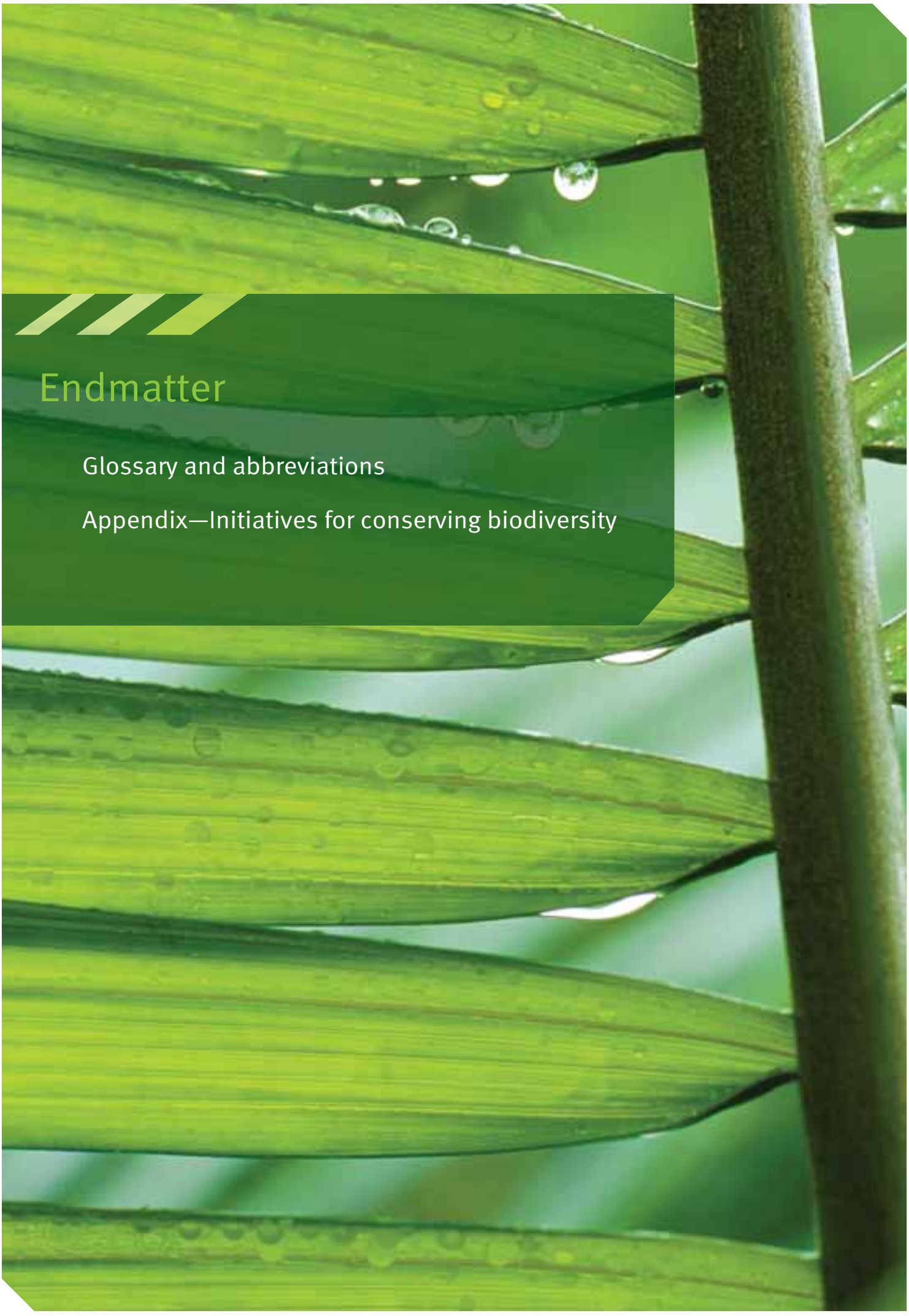
Priority actions

1. Establish a biodiversity governance framework to oversee progress made toward implementing the Queensland Biodiversity Strategy. Key elements of the framework include:
   - Establish a Biodiversity Joint Ministerial Advisory Committee including Ministers with portfolio interests relevant to the achievement of the Queensland Biodiversity Strategy outcomes and suitably qualified non-government representatives able to provide advice on the implementation of the strategy.
   - Biennial whole-of-government report against agreed indicators, benchmarks and/or targets once these have been established.
   - Comprehensive State of the Environment reporting every four years with the next report due by the end of 2011.
   - Establish a dedicated Biodiversity Business Group within DERM to provide implementation support of the biodiversity strategy, and which is charged with coordinating the whole-of-government reporting against the biodiversity strategy actions.
   - Establish a non-standing Expert Reference Panel with relevant technical expertise to peer review biennial and State of the Environment reports; advise on the development of indicators and benchmarks for evaluating government performance; engender dialogue and information exchange between science and policy-makers; and advise on data and science matters relating to biodiversity.

6(c) Ensure that State planning instruments are progressively reviewed, updated and developed to address the protection of biodiversity values

Priority actions

1. Develop a streamlined State planning instruments approach for the protection of biodiversity values that:
   - provides a consistent and transparent approach to biodiversity protection
   - consolidates biodiversity interests in the planning and development framework
   - addresses gaps in biodiversity protection
   - provides for the strategic identification of areas of ecological significance
   - reduces the regulatory burden by removing some DERM development assessment referral roles.
2. Implement the State Planning Policy for Coastal Protection; the Revised Queensland Coastal Plan and the State Planning Policy: Protecting Wetlands of High Ecological Significance in Great Barrier Reef catchments.
3. Implement the State Planning Policy for Healthy Waters in cooperation with local government.
4. Ensure biodiversity values are properly considered within the planning framework and the state's interests in biodiversity are reflected within the framework.
5. Identify and map areas of ecological significance at suitable scales and include as appropriate in relevant planning instruments.
6. Integrate the *Nature Conservation Act 1992* objectives with the *Sustainable Planning Act 2009*.
7. Ensure regional priorities for protecting and enhancing biodiversity values are expressed in regional NRM plans and incorporated into regional and local planning processes.
8. Implement the Queensland Biodiversity Offset Policy.
9. Ensure that development assessment and decisions are based on best available information on the state of biodiversity in Queensland.



Endmatter

Glossary and abbreviations

Appendix—Initiatives for conserving biodiversity

Glossary and abbreviations

Adaptive management—A systematic process for continually improving management policies and practices by learning from the outcomes of operational programs and incorporating new information.

AgForce—Lobbying organisation for sectors of the beef, sheep and grain industry.

Annuals—An annual plant; annuals germinate, blossom, produce seed, and die in one growing season.

AquaBAMM—A decision support tool that utilises existing information and expert opinion to assess the conservation value of Queensland's wetlands.

Aquaculture—The cultivation of aquatic animals and plants, esp. fish, shellfish, and seaweed, in natural or controlled marine or freshwater environments; underwater agriculture.

Back on Track—Back on Track species prioritisation framework is an initiative of the Queensland Government to guide conservation, management and recovery of native wildlife species. It is designed to prioritise all species, regardless of their current classification under the Queensland *Nature Conservation Act 1992* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Ballast water—Ballast water is water that large ships use to help balance the ship when it does not have a full load of cargo.

BAMM—Biodiversity Assessment and Mapping Methodology

Biocultural diversity—Both the plants and animals of a place and the people, knowledge, stories, songs and traditions that belong to them.

Biodiscovery—The collection of small amounts of native biological resources (such as plants, animals and fungi native to Australia) and subsequent screening to identify bioactive compounds that may be used for commercial purposes (e.g. pharmaceuticals and insecticides).

Biodiversity—The variety of all life forms on earth, the different plants, animals and micro-organisms, their genes, and the terrestrial, marine and freshwater ecosystems of which they are a part.

Biodiversity mainstreaming—The cohesive embedding of biodiversity conservation into public and private sector planning, decision-making and systems for reporting against defined biodiversity indicators, to ensure effective and progressive practices through adaptive management.

Bioproducts—Materials, chemicals and energy derived from renewable biological resources.

Bioregion—Large, geographically distinct areas of land or sea with common characteristics such as geology, landform patterns, climate, ecological features and plant and animal communities.

Biosecurity—Biosecurity means mitigating the risks and impacts to the economy, the environment, social amenity or human health associated with pests and diseases.

Biosequestration—The capture and long-term storage of carbon in soils, oceans and vegetation.

Broadscale clearing—Extensive vegetation clearing.

Bycatch—Unwanted marine creatures that are caught in the nets while fishing for another species.

CAR—Comprehensive, adequate and representative

Carbon market—A market-based approach to control pollution by providing economic incentives for reduced emissions of pollutants.

Carbon sequestration—The capture and long-term storage of carbon in soils, oceans and vegetation.

CATER—Carbon Accumulation Through Ecosystem Recovery

Climate change—Change in the climate attributed directly or indirectly to human activity that alters the composition of the global atmosphere and observed over an extended period.

ClimateQ—In 2008, the Queensland Government commenced a review of Queensland's climate change strategies in response to national and international developments in climate change science and policy. ClimateQ: toward a greener Queensland presents the next phase in Queensland's response to the challenge of climate change and transition to a lower carbon future.

Close the Gap—A campaign calling on federal, state and territory governments to commit to closing the life expectancy gap between Indigenous and non-Indigenous Australians within a generation.

Coastal development—Development along the coast to cater for human settlement and urbanisation, infrastructure and economic activities.

Condition—When used in reference to Delbessie lands, condition is measured by the state of a number of attributes including pasture, soil, biodiversity, declared pests, salinity, riparian vegetation and natural water resources. When used in reference to ecosystems, condition refers to the level of degradation the system has experienced.

Connectivity—The many ways that natural systems are connected with each other.

Conservation Park—Conservation park is a class of protected area to which the *Nature Conservation Act 1992* applies.

Coral bleaching—The whitening of corals due to stress-induced death of protozoa, zooxanthellae or the loss of pigmentation in protozoa.

Cornerstones—A key action or activity around which we can build our biodiversity conservation efforts.

Corridors—Continuous remnant vegetation or patches of vegetation in the landscape that if managed for conservation values provide connectivity benefits. This will help ensure that connected ecological processes can continue. Corridors can be mapped at any scale, from a statewide to a local scale.

CSIRO—Commonwealth Scientific and Industrial Research Organisation

CYPAL—Cape York Peninsula Aboriginal Land

Degradation—Wearing down of the land by any degrading process, such as human land-use and vegetation clearing, or the erosive action of water or wind.

Delbessie Agreement—The Delbessie Agreement (also known as the State Rural Leasehold Land Strategy) is a framework of legislation, policies and guidelines supporting the environmentally sustainable, productive use of rural leasehold land for agribusiness.

DERM—Department of Environment and Resource Management

Ecofund Queensland—Ecofund Queensland is a Queensland Government initiative established to provide services to government and private sector clients to meet regulatory environmental offset requirements and to provide carbon offset and renewable energy products and services.

Ecological condition—The state of an ecosystem.

Ecological tipping point—Threshold or tipping point. The point in a system at which sudden or rapid change occurs, which may be irreversible.

Ecosystem—A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit

Ecosystem processes—The physical, chemical and biological actions or events that link organisms and their environment.

Ecosystem services—The goods and services provided by natural ecosystems that are valued because of the role they play in creating a healthy environment for human beings. This includes the provision of clean water; the maintenance of liveable climates; the pollination of crops and native vegetation; and the fulfilment of people's cultural, spiritual and intellectual needs.

Ecotourism—A tourism market based on an area's natural resources that attempts to minimise the ecological impact of tourism.

Endangered status—Under the International Union for Conservation of Nature classification system, a species is considered endangered when it is considered to be facing a very high risk of extinction in the wild. A regional ecosystem is considered endangered when a certain proportion of the pre-clearing area of that ecosystem has been cleared or degraded, and that regional ecosystem has a high risk of extinction.

Extent—The range over which something extends, for example, the area that a habitat or vegetation type covers.

Fire regime—The pattern, frequency and intensity of bushfires in a given area.

Fragmentation/fragmented landscapes—The process whereby patches of similar habitat (such as forests) are split or isolated, often occurring as a result of human activities such as clearing and logging. Fragmentation results in a loss in the amount and quality of habitat, it isolates species and limits genetic flow.

Habitat—The place where a population (e.g. human, animal, plant, microorganism) lives and its surroundings, both living and non-living.

HES—High ecological significance

Horticulture—The science and art of cultivating a garden, orchard, or nursery.

Hydrology—The science dealing with the waters of the earth, their distribution on the surface and underground, and the cycle involving evaporation, precipitation, flow to the seas, etc.

Iconic species—Species that have inherent social and cultural value.

IMA—Indigenous Management Agreement

Keystone species—A species that has an important influence on the type and number of species in an ecosystem. If a keystone species is removed or populations are altered it can have a dramatic effect on the entire ecosystem.

Land-ocean continuum—All the different natural and human systems that exist from the land to the sea. All these systems are linked, and therefore form a continuum rather than individual, independent systems.

Mainstreaming—see Biodiversity mainstreaming

Marine park—A marine park is a designated area under State or Commonwealth marine parks legislation established over tidal lands and waters to protect and conserve the values of the natural marine environment while allowing for managed use.

Marine protected area—MPAs are considered multi-use marine parks in Queensland that have varying levels of protection including those that are administered under State and Commonwealth marine parks legislation, and also includes fish habitat areas under the *Fisheries Act 1994*.

Master Plan—2001 Master Plan for Queensland's Parks System.

Monoculture—The cultivation of a single crop on a farm or in a region or country.

National Park—National park is a class of protected area to which the *Nature Conservation Act 1992* applies.

Natural systems—Natural ecosystems and environments

Nature refuges—Areas that have been assessed of significant value for conservation and: where landholders are willing to enter into a conservation agreement; are suitable to remain in private ownership as freehold or leasehold tenure; may be used for continuing sustainable management as defined in the conservation agreement; will be managed by the landholder.

NGO—Non-government organisation

NRM—Natural Resource Management

'Of concern' status—A regional ecosystem is considered endangered when a certain proportion of the pre-clearing area of that ecosystem has been cleared or degraded, and the persistence of that ecosystem is now tenuous.

ONE Plan—OnePlan is part of the Queensland Government's Blueprint for the Bush, a 10-year initiative to build a sustainable, liveable and prosperous rural Queensland, with healthy and productive landscapes. The OnePlan approach provides a framework for streamlining and simplifying regulatory requirements for landholders through existing property level planning, farm management and best management practice systems.

PAF—Protected areas for the future' companion document to the Queensland Biodiversity Strategy.

Pathogen—An agent that causes disease, especially a living microorganism such as a bacterium, virus, or fungus.

Perennial—Lasting for an indefinitely long time; enduring.

Precautionary principle—Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and ii) an assessment of the risk-weighted consequences of various options.

Prospectus—A document describing the major features of a proposed literary work, project, business venture, etc., in enough detail so that prospective investors, participants, or buyers may evaluate it.

Protected areas—Terrestrial, freshwater and marine areas that are specifically managed to conserve and protect Queensland's biological diversity and outstanding natural and cultural features. Different levels of protection are described under various legislation including the *Nature Conservation Act 1992*, *Marine Parks Act 2004*, *Fisheries Act 1994* and *Great Barrier Reef Marine Park Act 1975* (Commonwealth).

Q2—The Queensland Government's five ambitions to achieve by 2020 that address current and future challenges for Queensland; these are strong, green, smart, healthy and fair Queensland.

QPWS—Queensland Parks and Wildlife Services

Ramsar/Ramsar Convention—The Ramsar Convention, also called The Convention on Wetlands of International Importance, 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.

Reforestation—The revegetation of an area by allowing it to regrow or through active planting after it has been cleared.

Refugia—An area where special environmental circumstances have enabled a species or a community of species to survive after extinction in surrounding areas.

Remnant vegetation—A small surviving component of an original extent. Remnant vegetation includes all intact and predominantly intact vegetation communities, excluding young regrowth.

Resilience—An ecosystem's ability to recover and retain its structure and function following a temporary, external shock event.

Revegetation—The planting of native species in areas that have been cleared or highly modified. The mix of species may not be the same as originally occurring in that patch of vegetation.

Riparian—Relating to the bank of a river or other waterbody.

Savannah—A plain characterised by coarse grasses and scattered tree growth, esp. on the margins of the tropics where the rainfall is seasonal.

SoE—State of the Environment

SPP—State planning policy

Stock route—Stock routes are pathways for travelling stock on roads, reserves, unallocated state land and pastoral leases. In Queensland, a stock route may be a route ordinarily used for moving stock on foot or a road that is declared in the Land Protection Regulation 2003 to be a stock route.

Stressor—An activity, event, or other stimulus that causes stress.

Subregion—Major landscapes within each bioregion, each having a distinctive pattern of landform and soils.

Sustainable development—Also referred to as ecologically sustainable development. Australia's National Strategy for Ecologically Sustainable Development (1992) defines ecologically sustainable development as: 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'.

Terrestrial—Of or belonging to the land as opposed to the sea or air.

Tipping point—See 'Ecological tipping point'

Toward Q2—The Queensland Government's Toward Q2:Tomorrow's Queensland is a plan that tackles the state's biggest current and future challenges. DERM has responsibilities toward ensuring a 'Green Queensland'.

Traditional knowledge—In terms of biodiversity, traditional knowledge can be seen as the 'knowledge, innovations, and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity.'

UNESCO—United Nations Educational, Scientific and Cultural Organisation

UNFCCC—United Nations Framework Convention on Climate Change (1992)

Urban development—Areas that are developed for new or expanding urban settlements.

Urbanisation—The social process whereby cities grow and societies become more urban.

Vulnerable status—Under the International Union for Conservation of Nature classification system, a species is considered vulnerable when it is considered to be facing a high risk of extinction in the wild.

Whole-of-landscape—Holistic approach, looking not just at biodiversity issues in all parts of the landscape and seascape, but also issues such as local economies, agriculture, eco-tourism, and the health and social benefits for communities.

Table 1. State initiatives for conserving biodiversity

State programs, tools and initiatives for biodiversity conservation in Queensland							
	Primary legislation	**Agreements**	**Strategies, policies and plans**	**Programs and tools**	**Knowledge and awareness building**	**Incentives and funding**	**Regional**
Core influence **(Core or primary documents that directly influence biodiversity conservation and management in Queensland)**	■ *Nature Conservation Act 1992* ■ *Coastal Protection and Management Act 1995* ■ *Marine Parks Act 2004* ■ *Vegetation Management Act 1999* ■ *Wild Rivers Act 2005* ■ *Environmental Protection Act 1994* ■ *Sustainable Planning Act 2009* ■ *Wet Tropics World Heritage Protection and Management Act 1993* ■ *Fisheries Act 1994*	■ Delbessie Agreement	■ Toward Q2—Tomorrow's Queensland: Green—protecting our lifestyle and environment ■ Draft Naturally Queensland 2020. The Master Plan for protected areas, forests and wildlife (to supersede Master Plan) ■ Master Plan for Queensland's Parks System (2001) ■ Reef Water Quality Protection Plan (Reef Plan – 2009) ■ Queensland Coastal Plan (Note: The making of a new Queensland Coastal Plan was approved on 7 April 2011 and is anticipated to come into effect in late 2011) ■ ClimateQ: toward a greener Queensland (2009) ■ Marine Park Zoning Plans—Great Barrier Reef Coast, Great Sandy, Moreton Bay) ■ Protected Areas Management Plans	■ State of the Environment Queensland reporting ■ Nature Refuges Program ■ Queensland Wetlands Program ■ Terrestrial biodiversity and wetland conservation State interests (Areas of Ecological Significance) ■ Back on Track Species Prioritisation Framework ■ Reef Protection Package	■ Regional Ecosystem Mapping ■ Essential Habitat Mapping ■ Queensland Wetlands Mapping ■ WildNET ■ Wildlife Online ■ Recovery Action Database ■ Australia's Biodiversity and Climate Change: A strategic assessment of the vulnerability of Australia's biodiversity to climate change	■ Q2 Coasts and Country ■ EcoFund Queensland ■ Nature Assist ■ Blueprint for the Bush	■ Regional Coastal Management Plans—Wet Tropical Coast, Cardwell-Hinchinbrook, Curtis Coast, South East Queensland (to be superseded by the Queensland Coastal Management Plan) ■ State Regional Plans (under the *Sustainable Planning Act 2009*) ■ Natural resource management plans (for example, South East Queensland Natural Resource Management Plan 2009–2031)

Partial influence or supporting **(Partial or supporting documents that provide indirect influence or support to biodiversity conservation and management in Queensland, mainly by promoting ecologically sustainable development)**	■ *Cape York Peninsula Heritage Act 2007* ■ *Biodiscovery Act 2004* ■ *Water Act 2000* ■ *Land Act 1994* ■ *Land Protection (Pest and Stock Route Management) Act 2002* ■ *Recreation Areas Management Act 2006*	■ South East Queensland Forests Agreement (1999) and forest transfers process ■ Indigenous Land Use Agreements ■ Indigenous Management Agreements	■ Strategy for the Conservation and Management of Wetlands (1999) ■ Temporary State Planning Policy 1/11: Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments ■ State planning policy and State planning regulatory provisions for Koala conservation ■ Draft State Planning Policy for Healthy Waters ■ ClimateQ: Toward a Greener Queensland ■ ClimateSmart Adaptation 2007–12: An action plan for managing the impacts of climate change ■ ClimateSmart 2050. Queensland Climate Change Strategy 2007: a low carbon future ■ Species Conservation and Management Plans for Dugong, Estuarine Crocodile, Koala, Macropod, Whales and Dolphins, Protected Plants ■ Declared Fish Habitat Areas ■ Declared Dugong Protection Areas ■ Queensland Fisheries Strategy 2009–2014 ■ Queensland Biosecurity Strategy 2009–2014 ■ Queensland Government Environmental Offsets Policy (2008) ■ Policy for vegetation management offsets ■ Queensland Biodiversity Offset Policy 2011 (approved by Cabinet on 15 August, Decision No. 9973) ■ Draft Queensland Regional NRM Framework	■ Biodiversity Planning and Aquatic Conservation Assessments ■ BAMM (Biodiversity Assessment and Mapping Methodology) (including freshwater variations—AquaBAMM) ■ Park Profiles ■ Conservation Management Profiles ■ Rapid Assessment Program for protected areas ■ World Heritage Areas—Wet Tropics, Fraser Island, Gondwana Rainforests of Australia, Riversleigh, and the Great Barrier Reef ■ Biodiversity Action Plans (under BOT)	■ Enhancing Biodiversity Hot spots along Western Queensland Stock Routes ■ Connect with Nature ranger guided activities program ■ Tourism in Protected Areas (TIPA) initiative ■ Great! Walks Queensland ■ Bringing Back the Beach Scrub ■ David Fleay Wildlife Park ■ Water quality monitoring programs (Great Barrier Reef Paddock to Reef and Ecosystem Health Monitoring in South East Queensland)	■ Trust for Nature ■ Regional Natural Resource Management funding ■ ONE Plan ■ Commonwealth funding for National Reserve System acquisitions	■ Shorebird management strategies (for example, Moreton Bay) ■ Local government vegetation management and general biodiversity planning scheme provisions (including Redlands City Council—Biodiversity policy and strategy 2008–2012) ■ South East Queensland Healthy Waterways Strategy 2007–2012

Table 2. National and international initiatives for conserving biodiversity

National and international agreements, conventions, legislation, framework, strategies and policies supporting biodiversity conservation in Queensland				
	National legislation	**National agreements and frameworks**	**National strategies and policies**	**International agreements and conventions**
Core influence **(Core or primary documents that directly influence biodiversity conservation and management in Australia and Queensland)**	■ *Environment Protection Biodiversity Conservation Act 1999* ■ *Water Act 2007* ■ *Great Barrier Reef Marine Park Act 1975* ■ *Fisheries Management Act 1991* ■ *Wet Tropics of Queensland World Heritage Area Conservation Act 1994*	■ Intergovernmental Agreement on the Environment (1992)	■ Securing a clean energy future. The Australian Government's Climate Change Plan ■ Australia's Biodiversity Conservation Strategy 2010–2020 ■ National Strategy for Ecologically Sustainable Development (1992) ■ National Action Plan for Salinity and Water Quality (2000) ■ National Local Government Biodiversity Strategy (1999) ■ Strategy for Australia's National Reserve System 2009–2030 ■ Strategic Plan of Action for the National Representative System of Marine Protected Areas (1999) ■ National Biodiversity and Climate Change Action Plan 2004–2007 ■ Biodiversity Conservation Research: Australia's Priorities (2001) ■ Wetlands Policy of the Commonwealth Government of Australia (1997) ■ National Greenhouse Strategy (1998)	■ Convention on Biological Diversity (CBD, 1992) ■ Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention, 1971) ■ Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973) ■ Convention on the Conservation of Migratory Species of Wild Animals (Bon Convention, 1979) ■ Japan–Australia Migratory Bird Agreement (JAMBA, 1981) ■ China–Australia Migratory Bird Agreement (JAMBA, 1988) ■ Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA, 2007) ■ Agreement on the Conservation of Albatrosses and Petrels (2004) ■ World Heritage Convention (1972) ■ Intergovernmental Panel of climate change
Partial influence or supporting	■ *Natural Heritage Trust of Australia Act 1997* ■ *Regional Forest Agreements Act 2002* ■ *Native Title Act 1993* ■ *Environment Protection (Sea Dumping) Act 1981* ■ *Sea Installations Act 1987*	■ National Climate Change Adaptation Framework (2007) ■ Intergovernmental Agreement on a National System for the Prevention and Management of Marine Pest Incursions (2005) ■ Framework and Implementation Plan for a National Cooperative Approach to Integrated Coastal Zone Management (2006)	■ Biodiversity: Managing a national asset(2006) ■ Ecosystem Services and Australian Natural Resource Management (NRM) Futures (2007) ■ Commonwealth Coastal Policy (1995) ■ Australia's Oceans Policy (1998)	■ Asia-Pacific Migratory Waterbird Conservation Strategy: 2001–2005 ■ Rio Declaration on Environment and Development (1992) ■ United Nations Framework Convention on Climate Change (UNFCCC, 1992) ■ Kyoto Protocol to the UNFCCC (1998)

Partial influence or supporting **(Partial or supporting documents that provide indirect influence or support to biodiversity conservation and management in Australia and Queensland, mainly by promoting ecologically sustainable development)**		■ National Framework for the Management and Monitoring of Australia's Native Vegetation (2001) ■ Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia (JANIS criteria) (1997) ■ National Framework for Environmental Management Systems in Australian Agriculture (2002) ■ National Framework for NRM Standards and Targets (2002) ■ Council of Australian Governments Water Reform Framework (1994)	■ Coastal Catchments Initiative (2001) ■ Australia's National Programme of Action for the Protection of the Marine Environment from Land Based Activities (2006) ■ Caring for Country Outcomes 2008–2013 ■ Native Fish Strategy for the Murray-Darling Basin 2003–2013 ■ Australian Weeds Strategy (2005) ■ Australian Pest Animals Strategy (2005) ■ National Water Quality Management Strategy (1998) ■ National Water Initiative (2004) ■ National Principles and Guidelines for Rangeland Management (1999) ■ National Approach to Firewood Collection and Use in Australia (2001) ■ Farm Forestry National Action Statement (2005) ■ Great Barrier Reef Tourism Climate Change Action Strategy 2009–2012 ■ National Forest Policy Statement (1992) ■ Guidelines for the Ecologically Sustainable Management of Fisheries (2007)	■ Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention, 1975) ■ Convention on the Conservation of Nature in the South Pacific (Apia Convention, 1986) ■ United Nations Convention on the Law of the Sea (1982) ■ Indian Ocean–Southeast Asian Marine Turtle MOU (2001) ■ International Plan of Action for the Conservation and Management of Sharks (1999) ■ The Partnership for the Conservation of Migratory Waterbirds and Sustainable Use of their Habitats in the East Asian-Australian Flyway (Flyway Partnership, 2006) ■ International Convention for the Regulation of Whaling (1946) ■ The Partnership for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (2003) ■ International Plan of Action for the Management of Fishing Capacity (2001) ■ International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (1997) ■ Convention on the Conservation of Southern Blue Fin Tuna (1994) ■ Convention for the Control of Ships' Ballast Water and Sediments (2004) ■ International Convention for the Prevention of Pollution from Ships (1973) ■ International Convention on the Control of Harmful Anti-Fouling Systems on Ships (2001)

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