



Australian Government

**Department of Agriculture,
Water and the Environment**

Australia's Sixth National Report to the Convention on Biological Diversity

2014–2018

24 March 2020

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About this report

Australia has been a Contracting Party to the Convention on Biological Diversity (CBD) since 1993 and is committed to implementing its obligations under the CBD in accordance with national priorities.

All Contracting Parties, including Australia, are required by Article 26 of the Convention to report on the measures taken to implement the Convention and the effectiveness of these measures.

In 1996, all Australian governments endorsed the *Strategy for the Conservation of Australia's Biological Diversity*, as the first National Biodiversity Strategy and Action Plan (NBSAP) outlining how CBD obligations will be delivered in the domestic context. Following an extensive review, Australia released its third revised NBSAP *Australia's Strategy for Nature 2019-2030* on 8 November 2019.

Australia's Sixth National Report has been prepared in line with agreed CBD guidelines and provides an update on progress and actions taken over the period January 2014 to December 2018. It reflects key findings of the 2015 review of the second NBSAP and an assessment of measures contributing progress toward national targets.

Further information

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Acknowledgement of country

As a national level document, the authors and contributors acknowledge the traditional owners and custodians of country throughout Australia and their continuing connection to land, sea and community. We pay our respects to them and their cultures and to their elders both past, present and emerging.

We recognise Aboriginal and Torres Strait Islander people are vital partners in managing land and sea to improve environmental outcomes.

EXECUTIVE SUMMARY

Australia's Sixth National Report provides an update on progress towards biodiversity targets, as required under the Convention on Biological Diversity (CBD). It covers the period 2014 to 2018 and captures:

- a review of Australia's interim national targets established under *Australia's Biodiversity Conservation Strategy 2010–2030* (section I)
- a selection of measures contributing to Australia's interim national targets, aiming to improve the conservation status of Australia's ecosystems and species (sections II and III)
- Australia's contributions to the achievement of the global Aichi biodiversity targets set under the *Strategic Plan for Biodiversity 2010–2020* (sections IV and VI)
- Australia's contributions to the achievement of the *Global Strategy for Plant Conservation* targets (section V)
- an update to the status and trend of Australia's biodiversity and related conservation measures (section VII).

Australia's Biodiversity Conservation Strategy 2010–2030 (the Strategy) was endorsed by all Australian governments in 2010 as the guiding framework for conserving the nation's biodiversity. The Strategy set the vision that Australia's biodiversity is healthy and resilient to threats, and valued both in its own right and for its essential contribution to human existence with three identified priorities for action.

1. **Engaging all Australians**—to mainstream biodiversity, increase Indigenous engagement, and enhance strategic investments and partnerships.
2. **Building ecosystem resilience in a changing climate**—to protect biodiversity, maintain and/or re-establish ecosystem functions, and reduce threats to biodiversity.
3. **Getting measurable results**—to improve and share knowledge, deliver conservation initiatives efficiently, and implement robust national monitoring, reporting and evaluation.

Established prior to the adoption of the first Strategic Plan for the United Nations Convention on Biological Diversity in 2010, the interim national targets that supported the above three priorities for action whilst not fully aligned with the global targets, represented Australia's agreed approach to coordinate efforts at the national and sub-national level and across all sectors.

Since 2010, and continuing over this report's four year period to the end of 2018, all Australian governments together with the combined efforts of Indigenous Australians, the business sector, environmental non-government organisations, researchers, community groups and private individuals, have been successful in contributing positive outcomes for biodiversity.

While progress has been consistent with the intended objectives, the *2016 Report on the Review of the first five years of Australia's Biodiversity Conservation Strategy* revealed that this framework was not the strongest driver of national efforts, and this finding was one of the key drivers for all Australian Environment Ministers to subsequently reform Australia's National Biodiversity Strategy and Action Plan. The review also found that it was not possible to report on the level of achievement against each of the interim national targets due to insufficient national-scale data to comprehensively assess progress over the set timeframe. Noting that quantitative performance data across all targets is not available, progress has been determined through a subjective assessment of the combined efforts and evidence supporting progress toward the interim targets.

Accordingly, this Sixth National Report captures a range of measures and activities contributing to Australia's national targets and the global Aichi targets. While the programs discussed are mostly driven by national and sub-national governments, initiatives and on-ground activities delivered across all sectors are featured. The report gives an indication of the substantial investment of time and resources across Australia, and achievements to conserve biodiversity and manage Australia's land and sea scapes sustainably.

Good progress over the reporting period is presented in many areas, including:

- over 19 per cent of Australia's land, and around 37 per cent of Australian territory oceans protected in either terrestrial or marine parks and reserves
- trans-boundary feral animal eradication and control programs have increased for the purpose of protecting biodiversity, with some local and regional examples of success to reduce the number vertebrate pest species
- increased engagement with Indigenous peoples in the ongoing management of their land and sea country contributing to the protection and maintenance of biodiversity and traditional culture
- greater integration across the range of national and sub-national measures have proven to be effective in engaging stakeholders, raising awareness and addressing key threats to Australia's biodiversity. For example alignment of the Threatened Species Commissioner, the National Environmental Science Program, the Chief Environment Biosecurity Officer and other program measures to direct resources to the *Threatened Species Strategy* priority actions, achieving positive results for some of Australia's most threatened species and ecological communities.

Managing biodiversity across this large and diverse continent is challenging, and conserving our native species and ecosystems requires continued effort.

Australia recently revised and adopted a new National Biodiversity Strategy and Action Plan, being *Australia's Strategy for Nature 2019–2030* which aims to:

- better align Australia's National Biodiversity Strategy with international obligations and allow flexibility to adapt to changing environments
- improve implementation and coordination of biodiversity conservation activities
- better communicate with and engage broader audiences
- include all land and sea scapes, including marine, aquatic, production and urban environments.

We look forward to continued engagement with the global community and remain committed to making contributions towards the strategic approaches to conserve and protect our world's biodiversity.

TERMS USED AND THEIR MEANING IN THE AUSTRALIAN CONTEXT

Indigenous Australians

Recognising the diverse approaches to identifying Indigenous peoples at the national level, this report will use the terminology that is appropriate to each context.

‘Aboriginal and Torres Strait Islander peoples’, ‘Indigenous Australians’ and ‘Traditional Owners’ are used when referring to Indigenous peoples and local communities of Australia.

‘Indigenous peoples and local communities’ is the internationally adopted terminology also used in the report when referring to the collective of Indigenous Australians, their Indigenous group and local community where they live, whether it be on country located in remote, rural or urban Australia.

Connection to Country

The term ‘country’ is imbued with far greater meaning for Indigenous Australians than simply a reference to land and/or sea. Country encompasses land, water, ocean, sky and all life and geologic forms therein, which are inextricably linked. Country speaks to a peoples’ spiritual connection with that land and sea, articulated through the country’s dreaming, which has been passed down through generations. The opportunity to access and manage land and sea is critical in maintaining connection to country.

Under the Federation of Australia

‘**National**’ relates to policies, programs, regulation and activities that have relevance across Australia, including in Commonwealth, state and territory land and marine areas. The Australian Government also referred to as the ‘Commonwealth’ has international obligations to protect and conserve biodiversity under various conventions and treaties, and this guides national priorities and action.

‘**Sub-national**’ relates to policies, programs, regulation and activities that are relevant to one or more state, territory or local government area of land or sea. State and territory governments are responsible for regulating environmental matters in their respective jurisdictions, and are the primary regulators for Australia’s native plants and animals, land and sea management. Australia is comprised of six state and two territory jurisdictions, including Queensland, New South Wales, South Australia, Tasmania, Victoria, Western Australia, Australian Capital Territory and the Northern Territory.

I. INFORMATION ON THE TARGETS BEING PURSUED AT THE NATIONAL LEVEL

Australia's Biodiversity Conservation Strategy 2010–2030 (the Strategy), released in 2010, was the overarching biodiversity conservation framework guiding national and sub-national action of all governments during the period covered by this report from 2014 to 2018. It provided an overview of the state of Australia's biodiversity and an outline of collective priorities for conservation.

The Strategy was Australia's National Biodiversity Strategy and Action Plan (NBSAP), the principal instrument for implementing the United Nations Convention on Biological Diversity (CBD).

In 2014 all Parties to the CBD, including Australia, were requested to review and, as appropriate, update and revise their NBSAPs. This was to ensure alignment with the Convention's *Strategic Plan for Biodiversity 2011–2020* (the CBD's Strategic Plan) and its Aichi Biodiversity Targets.

As the Strategy provided for a review at the five year mark of implementation, Australia initiated its review in 2015 engaging all national and sub-national governments, three independent experts, and invited input from the public. The Strategy review report released in 2016 examined the operation and national implementation of the Strategy, assessed its ability to deliver Australia's international biodiversity-related commitments, and opportunities for improvement. It also assessed the suitability of the interim targets for driving progress toward the three intended outcomes of the Strategy, and effectiveness in their design against the 'SMART' (specific, measurable, attainable, relevant and time based) criteria.

While governments and other sectors had progressed many biodiversity conservation initiatives consistent with the intended objectives of the Strategy, the review revealed the Strategy did not drive these efforts. The key findings of the review noted:

- the Strategy did not engage, guide, or communicate its objectives to all audiences in a useful way
- the Strategy was too focused on preventing the loss of biodiversity in natural terrestrial environments and did not consider biodiversity across all landscapes
- the Strategy had not effectively influenced biodiversity conservation activities
- alignment with the CBD and other related international obligations could have been enhanced.

The 2016 review report recommended the Strategy be revised in light of these findings, recognising a national biodiversity policy framework is uniquely placed to deliver an agreed approach for managing trans-boundary environmental issues, address biodiversity-related matters where Australian Government authority is required, to coordinate effort and to leverage cross-sector investment on shared priorities for biodiversity management. All Australian Environment Ministers endorsed these findings and agreed to revise Australia's NBSAP in 2016.

Following extensive consultation, all Australian governments and the Australian Local Government Association endorsed a new NBSAP *Australia's Strategy for Nature 2019–2030* on 8 November 2019. Whilst not the subject of this 6th National Report, the revised strategy builds on the lessons learned from the previous Strategy and will provide the platform for substantially improving Australia's position to respond to future national and global biodiversity related assessments and to implement the new Global Biodiversity Framework following its anticipated launch in 2020.

During the report period 2014 to 2018, Australia pursued 10 interim national targets as guided by the previous Strategy. The following is an assessment of each interim target, detailing the rationale of each target at the time they were adopted, the corresponding global Aichi Targets, the lessons learned relating to the design and application of the targets and the range of measures that contributed to the targets.

Adoption of national biodiversity targets or equivalent commitments associated to the attainment of the Aichi Biodiversity Targets or other parts of the Strategic Plan for Biodiversity 2010-2020

Australia adopted national biodiversity targets or equivalent commitments in line with the Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets.

Australia's Biodiversity Conservation Strategy 2010–2030

The Strategy set the vision that Australia's biodiversity is healthy and resilient to threats, and valued both in its own right and for its essential contribution to human existence. The Strategy set priorities and associated outcomes, with areas for action to address the main threats to and decline of biodiversity in Australia, and provided the basis for governments, and others, to align their actions and investment within agreed national priorities for biodiversity conservation.

The Strategy included three priorities for action:

1. **Engaging all Australians**—to mainstream biodiversity, increase Indigenous engagement, and enhance strategic investments and partnerships.
2. **Building ecosystem resilience in a changing climate**—to protect biodiversity, maintain and/or re-establish ecosystem functions, and reduce threats to biodiversity.
3. **Getting measurable results**—to improve and share knowledge, deliver conservation initiatives efficiently, and implement robust national monitoring, reporting and evaluation.

The Strategy recognised Australia's biodiversity is distinct, irreplaceable and under immediate threat, that it is vulnerable to climate change and that action must be accelerated to address biodiversity decline. It reinforced the impact of threats such as habitat loss, degradation and fragmentation; invasive species; changing fire regimes; and the impact unsustainable use and management of natural resources has on our biodiversity.

National Target 1: By 2015, achieve a 25 per cent increase in the number of Australians and public and private organisations who participate in biodiversity conservation activities.

Rationale for the national target

All Australians—the public, business, industry, Indigenous peoples and local communities, private landholders, research and non-government organisations and all governments at national and sub-national levels—have a role to play in achieving a healthy and resilient environment that supports biodiversity.

Demonstrating the multiple benefits of biodiversity is fundamental to transform the way most Australians think about and value biodiversity. Mainstreaming biodiversity can be achieved by increasing awareness, boosting participation and encouraging efforts to integrate the consideration of biodiversity into decision-making processes. Current biodiversity conservation activities can be accelerated through the effective participation involving all sectors of primary industries and the community and encouraging more integration of biodiversity conservation in planning and management across all sectors.

Level of application:

National/federal

Sub-national

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target related to several Aichi Targets.

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Main related Aichi Biodiversity Targets

1 6 11 16

2 7 12 17

3 8 13 18

4 9 14 19

5 10 15 20

Other relevant information

In 1996, Australia developed *The National Strategy for the Conservation of Australia's Biological Diversity* in response to the ratification of the CBD. The *National Objectives and Targets for Biodiversity Conservation 2001–2005* was produced in 2001 to assist in setting time-bound objectives and targets for biodiversity conservation across the nation.

Reviews of the above strategy and related objectives and targets identified that the level of public awareness relating to these documents was low. *Australia's Biodiversity Conservation Strategy 2010–2030* addressed this gap by directing its first priority for action to engage all Australians.

The subsequent 2016 review found that while clear in its objective to encourage involvement by all, the Strategy did not identify specific roles to deliver intended biodiversity outcomes nor did it resonate meaning to the broader Australian public. Using language to better illustrate the values of biodiversity across natural, urban and productive landscapes that links with people's livelihood, health and wellbeing would have greater meaning to more Australians.

The review also identified that whilst the target set clear quantitative parameters, there was no clear process for a comparative assessment against a national baseline to be undertaken in 2015. The *Attitudes to the Environment* household survey conducted by the Australian Bureau of Statistics during the 2011–2012 financial year introduced a specific question to establish a baseline relating to people's involvement with environmental activities. No follow up to this survey question has since been undertaken. The cost of a national survey was also noted as being a challenge for any future comparison to measure progress against the baseline.

Relevant websites, web links and files

Australia's Biodiversity Conservation Strategy 2010–2030

<https://www.environment.gov.au/biodiversity/publications/australias-biodiversity-conservation-strategy>

Australia's Nature Strategy 2019–2030

<https://www.environment.gov.au/biodiversity/conservation/strategy>

Report on the Review of the first five years of Australia's Biodiversity Conservation Strategy 2010–2030

<http://www.environment.gov.au/biodiversity/publications/ /bio-cons-strategy-review-report.pdf>

4626.0.55.001 Attitudes to the Environment survey

<https://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4626.0.55.001Main%20Features72011-12?opendocument&tabname=Summary&prodno=4626.0.55.001&issue=2011-12&num=&view=>

National Target 2: By 2015, achieve a 25 per cent increase in employment and participation of Indigenous peoples in biodiversity conservation.

Rationale for the national target

Aboriginal and Torres Strait Islander peoples play a significant role in biodiversity conservation across Australia. This target gave recognition to the special connection and relationship that Indigenous Australians have with land and sea country. Evidence to date has proven that effective participation in biodiversity conservation activities delivers significant flow on benefits to advance Indigenous peoples and local communities' interests, opportunities and lives, and sustains cultural heritage while also delivering improved biodiversity outcomes.

Engaging Indigenous Australians in biodiversity conservation actively supports the maintenance and use of traditional knowledge and facilitates the two way transfer of ecological management knowledge with other biodiversity managers. This interaction and information exchange also brings opportunity for innovation, skill development and enables access to scientific knowledge to support the management of natural resources.

The professional field of environmental management and biodiversity conservation can provide significant opportunities for employment, for maintaining culture, and for improving the health and wellbeing for Indigenous Australians.

Level of application:

National/federal

Sub-national (State, Territory and local governments, Indigenous and regional organisations)

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target related to several Aichi Targets.

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Main related Aichi Biodiversity Targets

1 6 11 16

2 7 12 17

3 8 13 18

4 9 14 19

5 10 15 20

Other relevant information

At the time this target was established it was considered achievable through the continuation of government investment in programs supporting Indigenous Australians' engagement in natural resource management as the key driver to facilitate employment.

Aboriginal and Torres Strait Islander peoples hold title over a large area of Australia, including over 44 per cent of the total area conserved in the National Reserve System. These are voluntarily managed as protected areas to conserve and maintain biodiversity. National program investment and partnership arrangements have actively supported Indigenous employment, training and participation, facilitating exchanges of traditional ecological knowledge and scientific information, and extending participation of Indigenous peoples and local communities in decision-making regarding their land and sea country. In turn, these programs have helped to reinvigorate cultural practice amongst local communities supporting processes to share, record and use Indigenous ecological knowledge, respecting agreed protocols and enabling prior and informed consent from the Indigenous custodians of the knowledge.

The 2016 review report found that whilst Target 2 aimed to increase Indigenous employment and participation in biodiversity conservation, there was no specific mechanism to promote other related biodiversity outcomes, including integration of traditional ecological knowledge in environmental management and decision making. However, as indicated above this intent has been pursued across a range of national, sub-national and local conservation programs and through joint land and sea management arrangements, promoting the integration of traditional knowledge and practice in conservation management. Further details of these initiatives are included in section II, III and VI and demonstrated in various case studies throughout the report.

Relevant websites, web links and files

Indigenous Protected Areas

<https://www.environment.gov.au/land/indigenous-protected-areas>

Percentage of Indigenous Protected Areas in the National Reserve System

<https://www.environment.gov.au/land/nrs/about-nrs/ownership>

Indigenous rangers - Working on Country

<https://www.niaa.gov.au/indigenous-affairs/environment/indigenous-rangers-working-country>

Traditional Use of Marine Resources Agreements

<http://www.gbrmpa.gov.au/our-partners/traditional-owners/traditional-use-of-marine-resources-agreements>

Parks Australia – joint management programs for Uluru-Kata Tjuta, Kakadu and Booderee National Parks

<https://parksaustralia.gov.au/about/>

Australian Marine Parks – Indigenous engagement program

<https://parksaustralia.gov.au/marine/management/programs/indigenous-engagement/>

NSW Joint management of national parks

<https://www.nationalparks.nsw.gov.au/conservation-and-heritage/aboriginal-joint-management-of-parks>

Joint management Victoria

<https://www.parks.vic.gov.au/managing-country-together>

Western Australia joint management

<https://www.dpaw.wa.gov.au/parks/aboriginal-involvement/91-joint-management>

Indigenous natural resource management

<http://www.nrm.gov.au/indigenous-nrm>

Reef 2050 Indigenous implementation plan

<https://www.environment.gov.au/marine/gbr/publications/reef-2050-indigenous-implementation-plan>

Tiwi Marine Rangers

<http://tiwilandcouncil.com/index.cfm?fuseaction=page&p=238&id=64&smid=125>

TSRA Land and Sea Rangers

<http://www.tsra.gov.au/the-tsra/programmes/env-mgt-program/managing-our-islands-and-sea-country/land-and-sea-rangers>

National Target 3: By 2015, achieve a doubling of the value of complementary markets for ecosystem services.

Rationale for the national target

Australia's economic system does not fully reflect the value of protecting biodiversity for the benefit of current and future generations. Markets provide a way to value and encourage private investment in biodiversity conservation activities, proving added benefit for leveraging greater access to financial and practical resources to address biodiversity decline.

This target aimed to build on the experience gained in delivering market-based instruments, such as offsets and financial incentives for managing native vegetation. New and innovative markets for biodiversity and ecosystem services can generate strategic investments and collaborative partnerships, encourage economic planning at all levels to account for the cost of environmental damage and provide incentives for actions that protect or enhance the environment. This target underpinned the need for developing broader social recognition of the value of biodiversity as a public good.

Level of application (Please specify the level to which the target applies):

National/federal

Sub-national – (State, Territory and Local Governments, non-government organisations and environmental trusts.

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target related to Aichi Targets:

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Main related Aichi Biodiversity Targets

1 6 11 16

2 7 12 17

3 8 13 18

4 9 14 19

5 10 15 20

Other relevant information

This target was informed by the experience of national and sub-national level programs that promoted creation of complementary markets and market-based incentives to enhance strategic investments and partnerships for biodiversity conservation.

Since 2010, advances in innovative financing and partnerships have helped shape new initiatives such as the Australian Government's *Threatened Species Prospectus*, the Reef Trust's phased investment strategies, Emissions Reduction Fund and private sector schemes. Many of these are referenced in the Australian Land Conservation Alliance work to investigate alternative approaches to finance ecosystem restoration and conservation in Australia. Public-private partnerships to leverage greater private investment in biodiversity are becoming a more common approach in the pursuit of conservation outcomes.

The Australian Bureau of Statistics produce a selected set of environmental-economic accounts annually to support the growing demand for integrated environmental-economic information in Australia. The Environmental Expenditure Account whilst not produced as regularly, provides a potential mechanism for monitoring and reporting the value of complementary markets.

The 2016 Strategy review report found that this target was difficult to interpret and did not meet the specificity requirements under the 'SMART' criteria for assessing target effectiveness. The term 'complementary markets' was not defined and it was unclear what types of markets (biodiversity, water, carbon) and other activities (incentives, offsets) would contribute to the target's achievement. Further, the Strategy target was developed prior to work investigating requirements for establishing an environmental accounts system for biodiversity in Australia. The need for a robust valuation of ecosystem services was recognised but more work was required to build capacity and tools to support integrating valuation techniques in decision making. Australia's *Environmental-Economic Accounting Strategy and Action Plan* has since been finalised and released in 2018.

Relevant websites, web links and files

Threatened Species Prospectus

<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-prospectus>

Environmental-Economic Accounting Strategy and Action Plan

<https://eea.environment.gov.au/about/national-strategy-and-action-plan>

Environmental Expenditure Accounts

<https://www.abs.gov.au/ausstats/abs@.nsf/featurearticlesbyCatalogue/9E80135DB8053A73CA257F94001825E2?OpenDocument>

Reef Trust investment strategies

<https://www.environment.gov.au/marine/gbr/reef-trust/investments/approach>

Emissions Reduction Fund

<http://www.cleanenergyregulator.gov.au/ERF/About-the-Emissions-Reduction-Fund>

Environmental Stewardship Program

<http://www.nrm.gov.au/national/continuing-investment/environmental-stewardship>

Victoria's Bush Tender

<https://www.environment.vic.gov.au/innovative-market-approaches/bushtender>

New South Wales' Biodiversity Offsets Scheme

<https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/biodiversity-offsets-scheme>

Australian Land Conservation Alliance

<https://www.alca.org.au/conservation-on-private-land/conserve-land-page2/>

Expanding finance opportunities to support private land conservation

<https://alca.org.au/wp-content/uploads/Conservation-Finance-Scoping-Paper-6-October-2018.pdf?x20930>

National Target 4: By 2015, achieve a national increase of 600,000 km² of native habitat managed primarily for biodiversity conservation across terrestrial, aquatic and marine environments.

Rationale for the national target

Habitat loss, fragmentation and degradation are pressures affecting Australia’s species and ecological communities, and may also compromise the natural systems that deliver vital ecosystem services. The compounding effect of climate change combined with the unpredictability of its interactions with other pressures on biodiversity has the potential to overwhelm the capacity of current ecosystems to adapt.

Building resilience of Australia’s ecosystems is critical if biodiversity is to persist in the face of these pressures. Greater emphasis on protecting diversity and managing across a range of scenarios at an ecosystem level is aimed at helping preserve terrestrial, aquatic and marine environments. Increasing the amount of native habitat managed for conservation and improving connectivity between habitats continues to be a crucial element to build resilience. Promoting a range of complementary management approaches that help buffer sensitive habitat, safeguard the movement of species with a limited range or create stepping stones linking habitat to maintain ecosystem processes where there is fragmentation will ensure native species persist into the future.

Level of application:

National/federal

Sub-national – State, Territory and Local governments, regional non-government organisations, business and the private sector.

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target related to several Aichi Targets.

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes (referred in report as ‘land and sea scapes’).

Main related Aichi Biodiversity Targets

- 1 6 11 16
 2 7 12 17
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Other relevant information

Several government environmental programs continue to direct investment towards securing increasingly large areas of habitat for a broad range of threatened species and to enable the continued functioning of ecosystems. Indigenous organisations, regional natural resource management bodies and the private sector have joined forces to protect and manage networks of areas and build resilience for biodiversity. Whole-of-ecosystem local approaches are contributing to build resilience through efforts in reducing invasive species

and assessing and managing risk of hot dry seasonal fires with reliance on the collaboration of a range of partners, including input of contemporary science and Indigenous traditional ecological knowledge.

The 2016 Strategy review identified that this target lacked the specificity to effectively guide the parties on how to contribute to the target. The desired increase for each of the marine, aquatic and terrestrial environment type was not specified nor was there guidance on the intended contribution to the target from each sub-national jurisdiction.

More details about these activities contributing to this target are presented in sections II Measure 1, III-IV.

Relevant websites, web links and files

National Reserve System

<https://www.environment.gov.au/land/nrs>

Biodiversity Fund

<https://www.anao.gov.au/work/performance-audit/administration-biodiversity-fund-program>

Australian Marine Parks

<https://parksaustralia.gov.au/marine/>

Australia State of the Environment 2016: Biodiversity

<https://soe.environment.gov.au/sites/default/files/soe2016-biodiversity-launch-version2-24feb17.pdf?v=1488792935>

Threatened species projects to reduce the impacts of invasive predators

<https://www.environment.gov.au/biodiversity/threatened/publications/factsheet-tackling-feral-cats>

Ten Deserts Project

<https://10deserts.org/partners/>

Threatened Species Strategy Year Three Report

<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>

National Target 5: By 2015, 1,000 km² of fragmented landscapes and aquatic systems are being restored to improve ecological connectivity.

Rationale for the national target

Habitat clearing, changes in land-use, altered hydrology and pollution are known pressures that can lead to ecosystem degradation and fragmentation. There are laws in Australia regulating aspects of these activities but additional ecosystem and landscape-scale intervention, restoration and planning are needed to minimise impact.

Plant and animal species are less resilient to external pressures when the ecological communities of which they are a part shrink or change, or when populations become isolated. Recognising the cumulative and indirect effects of these impacts, and actively maintaining and re-establishing structural and functional connectivity across land and aquatic systems will contribute to build ecosystem resilience. As the climate changes, it is increasingly important to create opportunities for species to move and find resources, and to facilitate the protection of migratory species. Connectivity also plays a role in maintaining genetic diversity.

Level of application:

National/federal

Sub-national – State, Territory and local government areas, non-government organisations, private landholders and business

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target related to several Aichi Targets.

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider land and sea scapes.

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Main related Aichi Biodiversity Targets

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Other relevant information

Consistent with delivering on this target, several national level programs invest in on-ground environment action to re-establish and improve native vegetation, establish habitat connectivity to improve ecosystem function and support species movement in the landscape. For example:

- the Environmental Stewardship Program long-term projects are delivering incentives to landholders to improve the connectivity and resilience of threatened ecological communities, including nationally threatened grassy woodlands
- the 20 Million Trees program is targeting the planting of trees and understorey species to improve the condition of threatened ecological communities, re-establishing green corridors and urban forests
- the National Landcare Program's Regional Land Partnerships promotes best practice conservation and sustainable agriculture across the landscape, coordinating on-ground actions to protect and restore priority Ramsar wetlands, threatened ecological communities and threatened species habitat
- the National Landcare Program's Targeted Area Grants aimed to improve riparian and wetland functionality through erosion control and streamside plantings.

The 2016 Strategy review and the *Australia State of the Environment 2016* report identified the significant challenges in collating and standardising data from the multiple sources and scales to measure effectiveness of investment in biodiversity management and the progress across targets. The Australian Government provides coordination and leadership to build multiple lines of insight on Australia's ecosystems, their condition and connectivity, and change over time. Sub-national governments maintain ecosystem information

in line with their constitutional responsibilities. Collaborative activities across all states and territories are integrated with data aggregation and modelling activities to build a range of national products such as the National Vegetation Information System database, national land use and land cover mapping, and national models of ecosystems including their spatial pattern, connectivity and condition.

These efforts aim to improve Australia's capacity to report on the integrity of our ecosystems and change over time. While significant progress has been made, challenges remain, for example, on availability, accessibility and consistency of raw observation data. As these challenges are addressed our capacity to report more accurately on change at finer scales and time intervals will improve. More details are provided in sections III and IV.

Relevant websites, web links and files

Environmental Stewardship Program

<http://www.nrm.gov.au/national/continuing-investment/environmental-stewardship>

Target Area Grants

<http://www.nrm.gov.au/national/continuing-investment/target-area-grants>

Restoration of rivers, streams and wetlands

<http://www.seraustralasia.com/standards/egfreshwater.html>

20 Million Trees

<http://www.nrm.gov.au/national/20-million-trees>

National Landcare Program

<http://www.nrm.gov.au/national-landcare-program>

National Vegetation Information System and related products

<http://environment.gov.au/land/native-vegetation/national-vegetation-information-system>

Australia State of the Environment 2016

<https://soe.environment.gov.au/>

Murray-Darling Basin Authority – Water for the Environment

<https://www.mdba.gov.au/managing-water/water-for-environment>

Commonwealth Environmental Water Holder

<https://www.environment.gov.au/water/cewo>

National Target 6: By 2015, four collaborative continental-scale linkages are established and managed to improve ecological connectivity.

Rationale for the national target

Building on the intent of National Target 5, this target recognised that maintaining and re-establishing ecosystem functions as part of a holistic scaled-up approach to conservation is important for biodiversity to persist and survive. Building structural and functional connectivity at multiple scales, engaging complementary land use and collaborative management approaches will create greater opportunity for species to move and find resources as the climate changes and allow for continuing evolution.

Level of application:

National/federal

Sub-national – State, territory and local governments, private landholders, business and industry

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target related to several Aichi Targets.

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider land and sea scapes.

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Main related Aichi Biodiversity Targets

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Other relevant information

Released in 2013, the *National Wildlife Corridors Plan* formed the Australian Government’s framework to create an enduring network of national wildlife corridors. The plan set the foundation for large-scale corridor initiatives pursued and managed by a wide range of groups based on voluntary collaboration to connect community, landholders, governments and industry conservation efforts. From 2014 new national programs, including the Indigenous Protected Areas, 20 Million Trees program and the National Landcare Program’s regional stream integrated priority outcomes with focus to improve ecological connectivity. All activities targeted by these programs aimed to achieve regional and local scale outcomes. Smaller scale wildlife corridor projects that formed part of larger corridor initiatives (both existing or new) were funded with potential to scale up continental conservation linkages, for example the 10 Deserts Indigenous led partnership across Australia’s desert country.

Increasingly, a broad range of stakeholders are leading engagement and collaborating in the design and planning of continental-scale linkages with momentum to deliver complementary conservation and natural resource management practices and identify innovative solutions to support active management, knowledge building and monitoring activity. See section III for more details about these collaborative initiatives involving government, non-government, Indigenous and philanthropic organisations.

Relevant websites, web links and files

National Wildlife Corridors Plan

<https://webarchive.nla.gov.au/awa/20130904210021/http://www.environment.gov.au/biodiversity/wildlife-corridors/publications/national-plan.html>

National Landcare Program regional investments

<http://nrm.gov.au/regional> and <http://nrm.gov.au/regional-land-partnerships>

20 Million Trees Program

<http://www.nrm.gov.au/national/20-million-trees>

Indigenous Protected Areas

<https://www.environment.gov.au/land/indigenous-protected-areas>

10 Deserts Project

<http://tendeserts.org/>

National Target 7: By 2015, reduce by at least 10 per cent the impacts of invasive species on threatened species and ecological communities in terrestrial, aquatic and marine environments.

Rationale for the national target

Invasive species, including weeds, pest animals, insects and other invertebrates, as well as marine pests and disease-causing organisms, remain the dominant key threat to Australia's threatened species and ecological communities. Many of Australia's most destructive invasive species are already well established.

The systems for managing pests and disease, especially in Australia's primary production industries, are well known and successful. Threat management and reduction strategies complement whole-of-ecosystem approaches to build ecosystem and species resilience. Targeted actions to eradicate and control established invasive species requires concerted effort across multiple scales aiming to prevent further incursions and ensure the protection of biodiversity.

Level of application:

National/federal

Sub-national – State, Territory and Local governments, industry, community groups and private landholders

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target related to several Aichi Targets.

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Main related Aichi Biodiversity Targets

1 6 11 16

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Other relevant information

Australia State of the Environment 2016: Biodiversity themed report acknowledges that invasive species dominate the key threatening processes identified at national and sub-national levels and their pressure on biodiversity is not diminishing. Impediments to effective management of invasive species are attributed to a lack of adequate resourcing for managing invasives through to lack of effective and efficient monitoring to better understand distribution, interactions and management effectiveness of control efforts (<https://soe.environment.gov.au/theme/biodiversity>).

Australia remains committed to addressing the threat posed to biodiversity, adopting a combination of approaches at the national and sub-national level to deliver internationally significant systems and outcomes. National legislation and policy have identified national priorities for trans-boundary coordinated action to address the impact by invasive species on terrestrial, aquatic and marine ecosystems.

The 2016 Strategy review identified that this target was problematic given the specificity in reducing impact of invasive species on threatened species and ecological communities by 10 per cent. Recognising that pressures on biodiversity interact in a complex way, this target is not easily measured because the impact of invasives on threatened species is difficult to separate from other threats.

More information about these activities are outlined in sections II-IV.

Relevant websites, web links and files

Threat abatement plans

<https://www.environment.gov.au/biodiversity/threatened/threat-abatement-plans>

Crown-of-thorns starfish control program

<http://www.gbrmpa.gov.au/our-work/our-programs-and-projects/crown-of-thorns-starfish-control-program>

Australian Weeds Strategy 2017–2027

<http://www.agriculture.gov.au/pests-diseases-weeds/pest-animals-and-weeds/review-aus-pest-animal-weed-strategy/aus-weeds-strategy>

Australian Pest Animal Strategy 2017–2027

<http://www.agriculture.gov.au/pests-diseases-weeds/pest-animals-and-weeds/review-aus-pest-animal-weed-strategy/aus-pest-animal-strategy>

Be Pest-Free program for Queensland Islands (including within the Great Barrier Reef)

<https://www.qld.gov.au/environment/coasts-waterways/reef/islands-biosecurity/be-pestfree>

National Plant Biosecurity Strategy

<http://www.planthealthaustralia.com.au/national-programs/national-plant-biosecurity-strategy/>

National pest and disease outbreaks

<https://www.outbreak.gov.au/how-we-respond-to-outbreaks>

Reef 2050 Long Term Sustainability Plan

<http://www.environment.gov.au/system/files/resources/35e55187-b76e-4aaf-a2fa-376a65c89810/files/reef-2050-long-term-sustainability-plan-2018.pdf>

Reef 2050 Water Quality Improvement Plan 2017–2022

<http://www.environment.gov.au/news/2018/07/20/reef-2050-water-quality-improvement-plan-2017-2022>

Threatened Species Strategy

<https://www.environment.gov.au/biodiversity/threatened/publications/strategy-home>

Australian Feral Camel Management Project

<http://www.publish.csiro.au/RJ/pdf/RJ16028>

National Environmental Research Science Program (NESP). Various projects examine the impact of invasive species, for example:

- <http://www.nespthreatenedspecies.edu.au/projects/responses-of-threatened-species-to-cats-and-fire-management-in-kakadu-and-northern-savannas>

- <https://www.nespnorthern.edu.au/projects/nesp/cape-york-weeds/>
- <https://nesptropical.edu.au/index.php/round-5-projects/project-5-1/>

National Target 8: By 2015, nationally agreed science and knowledge priorities for biodiversity conservation are guiding research activities.

Rationale for the national target

To conserve biodiversity it is essential that efforts are correctly prioritised and targeted to produce the greatest long-term benefit for biodiversity. Science and research both contribute to fill knowledge gaps about biodiversity and play an important role to achieve a good outcome. To tap into new information, priorities for biodiversity conservation need to align and guide research priorities and effort. It is also crucial that new knowledge and information is accessible and communicated clearly to inform adaptive and innovative management approaches and decisions.

Level of application:

National/federal

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target aligned with several Aichi Targets.

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Main related Aichi Biodiversity Targets

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Other relevant information

At the national level, the Australian Government’s commitment to evidence based environmental policy was brought into focus with the long-term funding commitment to support environment and climate research through the National Environmental Science Program (NESP) from 2015. The NESP program builds on the predecessor programs, the National Environmental Research Program (NERP) and the Commonwealth Environmental Research Facilities (CERF), which commenced in 2005.

With a strong focus on collaborative, practical and applied research to inform decision making and on-ground actions, each of the six themed NESP research hubs deliver world-class research to help ensure the management of Australia’s biodiversity and environmental resources is based on the best available information. The hubs include:

- Clean Air and Urban Landscapes Hub: Research to support sustainability and liveability of urban areas
- Earth Systems and Climate Change Hub: Provides Earth systems and climate information in support of a productive and resilient Australia
- Marine Biodiversity Hub: Research for understanding and managing Australian oceans and temperate marine environments
- Northern Australia Environmental Resources Hub: Research to support the sustainable development of Australia's northern environments
- Threatened Species Recovery Hub: Research to support the management of threats and improve recovery of threatened species
- Tropical Water Quality Hub: Research to support the management of the Great Barrier Reef and other tropical waters by providing innovative research to maintain and improve tropical water quality from catchment to coast.

The NESP Research Priorities (Priorities) are determined by the national Minister for the Environment and the Department of Agriculture, Water and the Environment (Department) in consultation with the NESP Hubs and stakeholders. The Priorities aim to guide and contribute to the on-going dialogue between the hubs, the Department and other interests to develop a program of research, described in hub annual research plans, which is targeted towards the needs of NESP stakeholders.

The hubs connect scientists, policy makers, industry, Indigenous peoples and local communities, and have a substantial communications and knowledge brokering dimension. NESP research hubs complement other existing mechanisms, for example:

- partnering with Indigenous Australians in managing their land and sea country, including Indigenous Protected Areas (IPA) and other jointly managed national and sub-national conservation reserves, to support the exchange of Indigenous traditional and contemporary ecological knowledge and align research with management priorities for the benefit of all partners
- aligning research with priorities for action identified by the 2015 *Threatened Species Strategy*, Threatened Species Recovery Fund and *Threatened Species Prospectus*.

More detail on impact of NESP research activities is provided in sections II, III and IV.

The National Environment and Community Biosecurity Research, Development and Extension (RD&E) Strategy 2016–2019 establishes a national, coordinated and strategic biosecurity RD&E approach to maximise benefits from past and future RD&E investments to reduce impacts of pests, weeds and diseases on Australia's natural environment and the community.

Relevant websites, web links and files

National Environmental Science Program

<https://www.environment.gov.au/science/nesp/about>

Indigenous Protected Areas

<https://www.environment.gov.au/land/indigenous-protected-areas>

Threatened Species Strategy

<https://www.environment.gov.au/biodiversity/threatened/publications/strategy-home>

National Environment and Community Biosecurity Research, Development and Extension Strategy 2016–2019

<https://www.agriculture.gov.au/biosecurity/partnerships/nbc/research-development-extension-strategy>

National Target 9: By 2015, all jurisdictions will review relevant legislation, policies and programs to maximise alignment with Australia’s Biodiversity Conservation Strategy.

Rationale for the national target

Australia’s Biodiversity Conservation Strategy 2010–2030 was endorsed by all governments as the ‘policy umbrella’ over more specific national and sub-national frameworks. Relying on the combined efforts to achieve the Strategy national targets to produce the greatest long-term benefits for biodiversity, promoting collaboration and consistency to maximise effort. Given the dynamic and changing nature of biodiversity, and the evolution in scientific knowledge, adopting cycles of review to evaluate effectiveness of measures and understand changes in biodiversity status and response remains appropriate at various spatial and time scales.

Level of application:

- National/federal
- Sub-national – Australian jurisdictions (primarily State and Territory governments)

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target aligned with several Aichi Targets.

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Main related Aichi Biodiversity Targets

- 1 6 11 16
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Other relevant information

Within the Federation of Australia, environmental law is set at both the national and sub-national level with established mechanisms for review.

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government’s central piece of national environment law. The EPBC Act requires an independent review be undertaken at least once every ten years. The last review was completed in 2009. A second review commenced in October 2019 and is expected to make recommendations to allow the EPBC Act and its operation to address current and future environmental challenges.

Sub-national governments are the primary regulators for Australia’s native plants and animals and each have their own legislation and policies in place to conserve and manage biodiversity.

Alignment of sub-national conservation measures continues as a priority, and ongoing engagement cascading from the national and sub-national high level Meetings of the Environment Ministers to Senior Officials Group Forums, ensures all Commonwealth, State and Territory government interests are represented. Collaborative work to align and prioritise policy and program approaches occurred during the revision of the NBSAP, resulting in *Australia’s Strategy for Nature*, and through programs such as the National Environment Science Program (NESP) and research by the Commonwealth Scientific and Industrial Research Organisation

(CSIRO), who are collaborating with multiple partners including the sub-national governments to integrate and build knowledge on climate change and biodiversity.

The 2016 Strategy review report identified that the process and timing to align all jurisdiction's relevant policies, legislation and programs was challenging in the timeframe to meet the 2015 timed target and did not account for jurisdictions needing to consult and address the views of a range of stakeholders together with their own priorities.

Relevant websites, web links and files

Review of the EPBC Act

<https://epbcactreview.environment.gov.au/>

Review of Australia's Biodiversity Conservation Strategy 2010-2030

<https://www.environment.gov.au/biodiversity/conservation/strategy/review-australias-biodiversity-conservation-strategy-2010-2030>

National Environmental Science Program

<https://www.environment.gov.au/science/nesp/about>

Monitoring, measuring and conserving biodiversity

<https://www.csiro.au/en/Research/LWF/Areas/Ecosystems-biodiversity/Monitoring-biodiversity>

National Target 10: By 2015, establish a national long-term biodiversity monitoring and reporting system.

Rationale for the national target

Monitoring biodiversity over time builds an understanding about the drivers of change and how best to intervene and influence that change. Adopting an adaptive management framework is premised on having the knowledge and being supported by strong monitoring and reporting systems.

Evaluating and reporting on the implementation of the Strategy relies on the ability to collect and collate consistent information about the range of activities at the national and sub-national level, engaging all governments, as well as non-government sectors, businesses, Indigenous Australians, communities and individuals. This is not a task to be underestimated in a country as large and diverse as Australia. Monitoring techniques also need to consider multiple factors of input and outcomes, to measure true success and learn from previous actions.

Level of application:

National/federal

Sub-national – Australian jurisdictions (primarily State and Territory governments)

Relevance of the national target to the Aichi Biodiversity Targets (links between national targets and Aichi Biodiversity Targets).

This national target aligned with several Aichi Targets.

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Main related Aichi Biodiversity Targets

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Other relevant information

Although the Strategy envisioned a national approach to biodiversity monitoring and reporting, this did not come to fruition to meet the timed 2015 target. Despite this, considerable efforts have been made to develop and leverage data from a range of mechanisms available for reporting and monitoring biodiversity across the country.

The primary source for Australia's environmental reporting is the state of the environment series, developed every five years as required by the EPBC Act. The *Australia State of the Environment 2016* report (including all themes of its most current series) is presented on a digital platform for the first time, making it more accessible to a broader range of stakeholders.

Most of Australia's sub-national governments also produce their own state of the environment reports. This additional level of reporting enables more holistic measuring of Australia's environmental condition, current trends and pressures, as well as considering work undertaken to address particular impacts.

Other mechanisms available to provide national level information on biodiversity include the Atlas of Living Australia, the Terrestrial Ecosystem Research Network, the Australasian Virtual Herbarium, the Australian Biological Resources Study (ABRS), Australia's State of the Forest Report and the Collaborative Australian Protected Area Database. Reporting at the national level on natural resource management program activities funded projects by the Australian Government is managed in the Monitoring, Evaluation, Reporting and Implementation Tool (MERIT). The Australian Government is developing a targeted Long-term Monitoring Program to better track the outcomes of national investment in natural resource management over time.

Continuous improvement in these tools and reporting mechanisms, and their digital transformation and integration, is driving the emergence of a powerful new network for biodiversity information that is key to the improvements required for better reporting on biodiversity. The Australian Government recently announced an initiative to commence digital transformation of the environmental assessment process and one component of this is to develop a national approach to the collection of biodiversity data contributed by proponents. This data will be collected in a more consistent manner, stored where it can be found and available for reuse.

Australia is also working towards a Common Assessment Method (CAM) that sets consistent categories and criteria for the listing of nationally threatened species across all sub-national governments. A consistent approach can more reliably inform the pressures facing threatened species across the country.

Relevant websites, web links and files

Atlas of Living Australia

<https://www.ala.org.au/>

Australian Biological Resources Study

<https://www.environment.gov.au/science/abrs>

Australia's State of the Forest report

<http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018>

Australasian Virtual Herbarium

<https://avh.chah.org.au/>

Collaborative Australian Protected Area Database

<http://www.environment.gov.au/land/nrs/science/capad>

Common Assessment Method

<https://www.environment.gov.au/biodiversity/threatened/cam>

Monitoring, Evaluation, Reporting and Implementation Tool (MERIT)

<http://www.nrm.gov.au/my-project/monitoring-and-reporting-plan/merit>

Australia State of the Environment 2016

<https://soe.environment.gov.au/>

Australia State of the Environment 2016: Biodiversity

<https://soe.environment.gov.au/sites/default/files/soe2016-biodiversity-launch-version2-24feb17.pdf?v=1488792935>

Terrestrial Ecosystem Research Network

<https://www.tern.org.au/>

II. IMPLEMENTATION MEASURES TAKEN, ASSESSMENT OF THEIR EFFECTIVENESS, ASSOCIATED OBSTACLES AND SCIENTIFIC AND TECHNICAL NEEDS TO ACHIEVE NATIONAL TARGETS

The following section examines measures of national significance that contributed toward the achievement of the interim national targets set by *Australia's Biodiversity Conservation Strategy 2010-2030* (the Strategy). These examples demonstrate how progress in meeting targets is reliant on the combined efforts across multiple sectors to implement biodiversity conservation and sustainable management approaches backed by national regulatory, policy and/or financial measures.

The 2016 Strategy review report identified there is insufficient national-scale data to comprehensively assess the effectiveness of actions and progress toward national targets. The below assessments on how measures are tracking, their identified success, obstacles and future requirements are based on a subjective view taking account of recent published reviews and reports.

These examples were selected to highlight both new and continuing activity over the four year period where reforms, improved integration of programs and enhanced policy alignment contributed to the achievement of biodiversity outcomes. The measures have been assessed as being either effective or partially effective and contribute progress toward the identified national targets. Each have resulted in the following outcomes over this period including:

- a steady increase in the coverage of Australia's terrestrial and marine protected areas, securing biodiversity and building the resilience of ecosystems (Measure 1 - effective)
- accelerated and coordinated action to halt the decline of Australia's threatened species and ecological communities (Measure 2 – partially effective with more to be done)
- reforms to improve to Australia's biosecurity system to address the threat of invasive alien species (Measure 3 – partially effective with more to be done)
- alignment of policy to protect the vulnerable ecosystems of the Great Barrier Reef and manage threats (Measure 4 – partially effective with more to be done)
- a steady increase in the integration of traditional knowledge of Indigenous Australians contributing to the ongoing maintenance of Australia's biodiversity (Measure 5 – partially effective with more to be done).

Measure 1: Protected Areas – building the resilience of terrestrial and marine ecosystems

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan.

Australia's terrestrial and marine protected areas are the cornerstone of national efforts to conserve biodiversity. Protected areas are designed, selected and managed to represent important ecosystems, reduce threats and provide the foundation for more resilient land and sea scapes, buffering species and natural systems from pressures and threats, including climate change. The protected areas also provide social, economic and scientific benefits to the Australian community, for example eco-tourism contributing growth to regional economies.

Australia continues to actively implement two intergovernmental-agreed strategies that set national goals for achieving comprehensive, adequate and representative systems of terrestrial and marine protected areas, being [Australia's National Reserve System Strategy 2009-2030](#) and the [Strategic Plan of Action for the National Representative System of Marine Protected Areas \(ANZECC TFMPA 1999\)](#), respectively.

Combined with significant investment from national and sub-national governments over the last decade, Australia has continued to expand and manage terrestrial and marine reserves consistent with nationally agreed principles, exceeding its achievement of Aichi Target 11 for protected areas ahead of the 2020 timeframe.

Table 1 summarises progress since the Fourth National Report in 2009 to 2018, based on the Collaborative Australian Protected Area Database (CAPAD) 2018 published data, noting:

- **Australia's National Reserve System:** achieved an increase from 12 per cent in 2009 to more than 19 per cent in 2018 of the total terrestrial and inland waters protected as a percentage of the total terrestrial area of Australia. Over 151 million hectares of land is now protected within the National Reserve System. These areas comprise of national and sub-national public reserves, Indigenous lands, private protected areas managed by non-profit conservation organisations, business and private landholders. All 89 Australian bioregions have some representation, with 62 regions exceeding the target and 27 regions with less than 10 per cent protected.
- **Australia's marine protected areas:** achieved a total increase of more than 2.3 million square kilometres to nearly 3.3 million square kilometres of protected marine habitats. The National Representative System of Marine Protected Areas now includes 314 marine parks: 60 marine parks managed by the Australian Government (58 Australian Marine Parks located around the country, the Great Barrier Reef Marine Park, and the Heard Island and McDonald Islands Marine Reserve in the Southern Ocean) and 254 marine parks managed by state and territory governments. The marine components of two Australian Government terrestrial parks—Booderee and Pulu Keeling National Parks—also contribute to this system. Through the implementation of regional specific management plans and ecosystem-based management of the marine environment, the system allows ecologically sustainable use while protecting key habitats for the species that live there.

Table 1: Comparison of percentages presented in national reports over the last 10 years.

Status of protected areas	Fourth National Report (2008/2009 data)	Fifth National Report (2013 data)	Sixth National Report (2018 data)
Percentage of land area covered	Approximately 11 per cent (9000 areas)	16.25 per cent (10,008 areas)	19.74 per cent (12,052 areas)
Marine and coastal biodiversity	Approximately 10 per cent (over 200 areas in both state and Commonwealth waters)	36.2 per cent (over 300 areas in both state and Commonwealth waters)	36.7 per cent (316 areas in both state and Commonwealth waters)

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes.

Aichi Target 11: *By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider land and sea scapes.*

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes.

Measure taken has been effective.

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The substantial increase in Australia's protected area estate demonstrates the effectiveness of combining national policy with targeted financial investments to achieve the Aichi Target.

The CAPAD provides the spatial tool for calculating the national coverage of protected areas across both terrestrial and marine protected areas, tracking progress every two years. The system adopts nationally agreed scientific principles to consistently report the location and management of protected areas across all jurisdictions in Australia. The data is maintained by the Australian Government with updates provided by all

state and territory governments and other protected area managers and is available online. The information compiled in CAPAD 2018 forms the current status report, uploaded to World Database on Protected Areas.

Relevant websites, web links and files

National Reserve System

<https://www.environment.gov.au/land/nrs>

Collaborative Australian Protected Area Database (CAPAD)

<https://www.environment.gov.au/land/nrs/science/capad>

World Database on Protected Areas

<http://www.protectedplanet.net/>

Australia State of the Environment 2016

<https://soe.environment.gov.au/theme/overview>

Map showing Australia's National Reserve Systems and National Representative System of Marine Protected Areas is available at:

<http://www.environment.gov.au/system/files/pages/3a086119-5ec2-4bf1-9889-136376c5bd25/files/capad-2018-location-mpa.pdf>.

Australia's bioregions

<https://www.environment.gov.au/land/nrs/science/ibra>

Map showing Australia's 89 bioregions is available at:

www.environment.gov.au/system/files/pages/5b3d2d31-2355-4b60-820c-e370572b2520/files/bioregions-new.pdf.

Map showing underrepresented bioregions in Australia (regions with less than 10 per cent protection with in the National Reserve System) is available at:

<http://www.environment.gov.au/system/files/pages/3a086119-5ec2-4bf1-9889-136376c5bd25/files/ibra-underrep-capad-2018.pdf>.

Map showing the Australian Marine Parks is available at:

www.parksaustralia.gov.au/marine/pub/maps/National-Full-zoning-incl-SE.pdf

Other relevant information

See sections III and IV for more information and case studies on Australia's National Reserve System, including the Indigenous Protected Areas and Marine Protected Areas.

Obstacles and scientific and technical needs related to the measure taken:

The current challenge is to achieve full ecological representation in the National Reserve System particularly for those bioregions below the 10 per cent protected area target. Woodland and grassland ecosystems are the least well protected, as are wetlands in the arid and semi-arid zone and aquatic ecosystems. These ecosystems are the most likely to be highly fragmented, located where land is not available or where land use and tenure are not compatible with reservation requirements.

In addition, the *Australia State of the Environment 2016* and the review of the Strategy identified the ongoing challenge to coordinate and collaborate across reserves to effectively manage a system of well connected, ecologically representative protected areas. The lack of consistent monitoring limits capacity to evaluate the overall effectiveness of the reserve system, including management effectiveness, approaches to protect ecosystem diversity and improve the status of threatened species and ecological communities.

Fragmentation of native vegetation in protected areas is also an issue, with approximately half of the natural heritage areas in Australia that occur in public reserved lands are located in pockets of less than 100 hectares. Managing for resilience across the system requires input of good baseline data to inform adaptive management over time and facilitate better on-ground solutions that target ecosystem degradation and stress.

A working group representing national and sub-national government environment agencies was established in 2018 to pursue a renewed policy agenda for the National Reserve System. The group will identify on-ground action and opportunities on a range of priorities including how to increase Indigenous engagement and participation and how to improve monitoring and evaluation to support adaptive management across the system of reserves.

Measure 2 – Elevate national focus to threatened species and ecological communities

Describe a measure taken to contribute to the implementation of your country’s national biodiversity strategy and action plan.

In 2014 the Australian Government set a long-term goal to halt the decline of Australia’s threatened plants and animals and support their recovery. The following combination of measures have been introduced to accelerate effort to achieve this goal.

- Appointment of Australia’s first Threatened Species Commissioner in 2014 to bring a national focus to threatened species. The Commissioner consults on, raises awareness and support for threatened species across the community. Leading on new conservation initiatives and strategic approaches the work of the Commissioner complements the national threatened species protection measures under the EPBC Act, including collaboration with the national Threatened Species Scientific Committee with oversight of recovery planning measures.
- Launched in 2015, the *Threatened Species Strategy* outlines the Australian Government’s approach to conserving Australia’s threatened plants and animals by addressing threats and taking action. The accompanying five-year Action Plan to 2020 relies on science, action and partnerships helps to focus species recovery effort. Key action areas include tackling feral cats, providing safe havens for species most at risk, improving habitat, and emergency interventions to avert extinctions. Principles for prioritisation are included in the Action Plan with 87 explicit and measurable targets to tackle the threat of feral cats, improve the trajectories of priority species (20 mammals, 20 birds, and 30 plants) and improve recovery practices.
- A *Threatened Species Prospectus* was announced as an innovative financing measure aimed at mobilising the business sector to co-invest in conservation programs and deliver biodiversity outcomes. Since the launch of the prospectus in February 2017 more than \$7 million in funding for 19 projects has been mobilised across non-government and government sources.
- Over the four years from 2014 to 2018, the Australian Government has mobilised more than \$425 million for over 1300 projects supporting priority outcomes for threatened species. This includes projects delivered under a range of national programs including the National Landcare Program, Threatened Species Recovery Fund and the National Environmental Science Program (NESP), notably the Threatened Species Recovery Hub (\$23.8 million over 6 years).
- In October 2018 the inaugural Chief Environmental Biosecurity Officer (CEBO) was also appointed. The CEBO is the primary representative and advisor to the Australian Government on environmental biosecurity risks and works closely with the Threatened Species Commissioner. The CEBO is supported in their work by an ongoing Environmental Biosecurity Project Fund and has prioritised development of a National Priority List of Exotic Environmental Pests and Diseases (see measure 3 for more details on the CEBO role).

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes.

Aichi Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Aichi Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes.

Measure taken has been partially effective

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The *Threatened Species Strategy* includes a commitment to report progress towards the targets at the one, three and five year mark of implementation.

The *Threatened Species Strategy Year Three Report* covering progress to 2018 identifies where collective actions are making a difference, indicating that good progress has been made towards the ambitious targets set. Of the 21 year three targets, 11 were met, four were partially met and six targets were not met. Even where targets were not met, in most cases good progress was made. For example 844,000 feral cats were culled over the past three years, short of the 1 million target; eight mammals from a target of 10 had an improved trajectory; and not all active threatened species recovery teams were able to report annually on their progress (however, trials of a national reporting framework are progressing). Some targets were over-achieved, for example 61 per cent of Australia's known threatened species are now stored in an Australian Seed Bank Partnership seedbank, exceeding the target of 50 per cent, and providing an important insurance policy for the future. More specific detail is outlined under section IV.

The Office of the Threatened Species Commissioner worked closely with scientific experts, researchers, practitioners and the community to take stock of actions underway on the ground and to compile the most robust and up-to-date data available on species' trends and threat abatement activities.

As the *Threatened Species Strategy* action plan covers a five-year period, tracking towards targets will continue over the next two years and the above assessment of partial effectiveness reflects continuation of implementation to 2020.

The CEBO and Environmental Biosecurity Office also worked with scientific experts, researchers, practitioners and the community to determine priority actions required to protect Australia from pests (including invasive species) and diseases that affect the environment (including threatened species).

Relevant websites, web links and files

Australia State of the Environment 2016

<https://soe.environment.gov.au/>

About the *Environment Protection and Biodiversity Conservation Act 1999*

<https://www.environment.gov.au/epbc/about>

Threatened Species Strategy

<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy>

Threatened Species Strategy Year Three Report

<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>

Chief Environmental Biosecurity Officer

<https://www.agriculture.gov.au/biosecurity/environmental/cebo>

Other relevant information

Further information on Australia's threatened species and ecological communities, including case studies, can be found in section IV.

Obstacles and scientific and technical needs related to the measure taken:

The *Threatened Species Strategy* set ambitious targets to improve the trajectory of priority birds, mammals and plants. Meeting these targets is recognised as a challenge and will require a sustained long-term investment of time and resources.

Coordination remains a significant challenge to effect strategic outcomes of this strategy, particularly for those threatened species that migrate or occur over a large range. In particular, more effort is needed to strengthen coordination and ensure recovery actions are rigorously monitored and reported. Implementation to date has contributed toward building effective governance structures to improve collaboration across all recovery partners, including national and sub-national governments, regional natural resource management groups, non-government organisations, the scientific community, Indigenous groups and the community. Over the remaining two years of this strategy, additional effort will be directed to support recovery teams in their voluntary uptake of the new recovery team governance guidance and online tool for reporting progress relating to recovery activity.

The *Threatened Species Strategy Year Three Progress Report* identified that almost one third of the world's threatened plant species are not amenable to traditional seed banking techniques and that more work is needed to better understand alternative options. This will make it impossible for all threatened Australian plants to be stored in traditional conservation seed banks in the near future and will make it very difficult to deliver on the year five target. The Office of the Threatened Species Commissioner will continue to work closely with the Australian Seed Bank Partnership to conserve as many of Australia's threatened plants in seed banks as possible.

Measure 3: Strengthening the national biosecurity system to tackle invasive alien species

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan.

A national biosecurity system plays a critical part in Australia's efforts to prevent, respond to and recover from pests and diseases that threaten Australia's unique environment, agricultural communities, way of life and economy. Australia's biosecurity system applies 'Appropriate Level of Protection' to manage biosecurity risk to a very low level, but not to zero, to ensure the safe movement of people, animals, plants, food and cargo into Australia. To do this, an integrated approach is used with complementary measures applied across the biosecurity continuum: offshore, at the border and onshore. The national biosecurity system is dynamic, with a range of biosecurity, quarantine and invasive species measures evolving over several decades in response to threats posed by climate change and globalisation in accelerating the spread and impacts of pests and diseases across the world.

Significant reforms to strengthen the system have included new legislation, targeted policy and resources from a risk management perspective, and structural and behavioural change to better address emerging challenges and threats from alien species and pathogens offshore, at the border and in Australia.

The following combination of measures aim to tackle invasive species by preventing their entry where feasible, eradicating those that do enter and managing the negative impacts of those that become established. All of these measures complement the renewed biosecurity focus.

- The national *Biosecurity Act 2015* came into effect on 16 June 2016, replacing the *Quarantine Act 1908*. This Act represents a comprehensive modernisation of Australia's biosecurity legislation to protect animal and plant (including native species) health and human health from alien pests and disease while maintaining market access for Australian food and other agricultural exports. This Act

complements other legislative measures including provisions in the EPBC Act relating to threatened species recovery, threat abatement planning and wildlife trade restrictions.

- Revisions to improve and extend coverage of the *Australian Weeds Strategy 2017–2027* and *Australian Pest Animal Strategy 2017–2027* as the key national policy frameworks for addressing weed and pest animals, contributing to the sustainability of our primary industries and protecting the environment. Both strategies identify shared responsibility between national, sub-national and local governments land management agencies, the network of Indigenous rangers, industry, landholders and the community.
- Appointment of the first Chief Environmental Biosecurity Officer in 2018 to be the national lead on environmental biosecurity policy and coordination.
- Consultation to develop the *Priority list of exotic environmental pests and diseases*, listing alien species and pathogens not established in Australia but likely to pose the highest risk to our environment and public spaces. Once final, this list will be used to facilitate activities that enable identification of and help prevent the entry, establishment and spread of exotic pests, weeds and diseases that have the potential for nationally significant negative impacts on Australia’s environment and/or social amenity.
- Finalising a number of threat abatement plans to identify research, management and other actions needed to ensure the long-term survival of native species and ecological communities affected by key threatening processes. These plans addressed the impacts of rabbits, feral pigs, *Phytophthora cinnamomi*, chytrid fungus and predation by feral cats.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes.

Aichi Target 9: By 2020, invasive alien species and pathways are identified and prioritised, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes.

Measure taken has been partially effective

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

While there is still progress to be made, the reviews of both the national weed and pest animal strategies and their underpinning principles signalled a growing commitment in building and maintaining collaborative efforts to address the invasive species problem across Australia. The revised strategies are set within the context of a modernised national biosecurity system that allocates shared responsibility of landholders, industry, the community and all levels of government as critical for coordinating effective prevention and management.

The recent appointment of the inaugural Chief Environmental Biodiversity Officer will enhance national coordination and elevate environmental biosecurity capability and capacity.

Based on the findings of the *Australia State of the Environment 2016: Biodiversity*, ‘it is not possible to assess the overall long-term effectiveness of management actions taken to limit the impact of invasive species’ on biodiversity. Whilst there are good examples of success in local eradication efforts and management to reduce the impact of invasive species (including the only successful eradication of Red Imported Fire Ant incursions from different locations), assessing overall management effectiveness is difficult because monitoring is often missing, incomplete or only at a local scale. Reporting of management outcomes is often very limited.

Relevant websites, web links and files

Biosecurity in Australia
<http://www.biosecurity.gov.au>

Australian Weeds Strategy 2017–2027

<http://www.agriculture.gov.au/pests-diseases-weeds/pest-animals-and-weeds/review-aus-pest-animal-weed-strategy/aus-weeds-strategy>

Australian Pest Animal Strategy 2017–2027

<http://www.agriculture.gov.au/pests-diseases-weeds/pest-animals-and-weeds/review-aus-pest-animal-weed-strategy/aus-pest-animal-strategy>

Environmental Biosecurity

<http://www.agriculture.gov.au/biosecurity/environmental>

Threat abatement plans

<http://www.environment.gov.au/biodiversity/threatened/threat-abatement-plans>

Other relevant information

Further information on Australia’s biosecurity and pest management approaches, including case studies, can be found in section IV and VI, including various case studies being led by Indigenous rangers.

Obstacles and scientific and technical needs related to the measure taken:

The *Australia State of the Environment 2016* confirmed that invasive species continue as a significant pressure on biodiversity and their impact is not diminishing. Limited resourcing for managing and monitoring invasive species at the local through to national scale is a major challenge. The absence of national data collation on incursions, pathways and risks is also highlighted as an impediment to effective management.

The ever increasing scale, complexity and risks associated with Australia’s international trade pathways—including the prevalence of contaminant or ‘hitchhiker’ pests, e-commerce transactions, and intentionally illegal activities—are somewhat quantifiable (using resources such as the Risk-Return Resource Allocation model). However there is limited international action to ‘clean up’ travel and trade risks, compounded by the constantly changing nature of the risk of invasive species arriving at Australia’s borders (such as Brown Marmorated Stink Bugs and Red Imported Fire Ants).

The size and complexity of the Australia’s environment make intervention more challenging, particularly the scale and variation of threats within the productive and natural landscape context. In some cases, authorities are still in the early stages of learning about the likely impacts and nature of some threats, for example, the impact of myrtle rust on Australia’s eucalypts, lack of research and development on impact, or the lack of informed development of biosecurity plans for conservation areas or other biodiversity assets. Under these circumstances, developing effective strategies can be challenging. For many invasive species (particularly invertebrates) identification still occurs via morphological identification, and the number of experts available to do so globally can be extremely limited. Further, due to the unique nature of many native species found in Australia, determining the likely impacts (and behaviours) of an invasive species on our environment can also be difficult. Examples of coordinated activities and case studies are included in sections III, IV, V and VI.

Measure 4: Ecosystems vulnerable to climate change – Great Barrier Reef

Describe a measure taken to contribute to the implementation of your country’s national biodiversity strategy and action plan.

Like many reefs around the world, Australia’s Great Barrier Reef (the Reef) is under pressure from the impacts of climate change and related flow-on effects, including altered weather patterns, ocean acidification and sea level rise. Listed as a World Heritage property in 1981 for its outstanding beauty, size and the complexity of its ecosystem, protecting the Reef’s integrity and ecological diversity has elevated priority.

New policy measures and investment in research to complement the existing legislated protection and cooperative management arrangements have been pursued jointly by the Australian and Queensland governments.

The *Reef 2050 Long-Term Sustainability Plan* was introduced in 2015 as the overarching strategy to address key threats and build the resilience of the Reef in the face of a changing climate. This Plan was developed with input from scientists, traditional owners, industry, local communities and non-government organisations. The Australian and Queensland governments continue to work closely with these stakeholders on the implementation and review of the Plan. The Plan is informed by the *Outlook Reports*, which are released every five years and foundationally on a comprehensive two-year strategic assessment of the region.

To support the implementation and future revisions of the Plan the Australian and Queensland governments have invested \$8 million in the Reef 2050 Integrated Monitoring and Reporting Program. Development of this innovative program is being led by the Great Barrier Reef Marine Park Authority in collaboration with more than 200 Australian and Queensland government representatives, scientists and community stakeholders. Once operational the program will bring together key information on the Reef and its catchment within a knowledge system that will enable better targeting of management actions and improved reporting on progress against the Plan's targets. Other collaborative policy elements supporting sustainable Reef management include the *Reef 2050 Policy Guideline for Decision Makers*, the *Indigenous Implementation Plan*, the *Reef 2050 Water Quality Improvement Plan 2017–2022*, *Cumulative Impact Management Policy* and the *Net Benefit Policy*. There is also a *Reef 2050 Plan Investment Framework*, which provides guidance on priorities for investment in the Reef.

Since the Plan was released in 2015 regular progress and annual reports have examined implementation of actions to maintain the health of the Reef. Responding to the coral bleaching events in 2016 and 2017, the scheduled mid-term review was brought forward, culminating in a revised and updated *Reef 2050 Long-Term Sustainability Plan* in 2018. The mid-term review was the first stage to a more comprehensive review of the Plan, to be undertaken in 2020. The Great Barrier Reef Marine Park Authority's *Great Barrier Reef Blueprint for Resilience*, the *Reef 2050 Plan Review Options*, prepared by a consortium of experts, and advice provided by Reef 2050 Advisory Bodies, the Independent Expert Panel and the Advisory Committee all contributed input to shape the revised Plan.

Responses to stresses on the Reef include innovative programs such as the Great Barrier Reef Marine Park Authority program to control crown-of-thorns starfish. The *Reef 2050 Long-Term Sustainability Plan* identifies outbreaks of these naturally occurring starfish as a key threat to the health of the Great Barrier Reef. The *Great Barrier Reef Blueprint for Resilience* states that reducing the impacts of current outbreaks of these starfish, through targeted control is one of the most scalable and feasible actions for reducing coral mortality and preventing further declines in the resilience of the Great Barrier Reef. The Authority's control program operates in accordance with an integrated pest management framework where consistent and repeated culling is critical in keeping starfish densities below ecological sustainable levels that promote coral growth and recovery. The work undertaken by control vessels includes starfish surveillance, culling, Reef health surveys and support for starfish control and monitoring research.

This Reef Joint Field Management Program is a vital component of Marine Park management, and is undergoing a doubling in investment, significantly increasing capability. The program provides an in-park presence delivering practical conservation actions, checking for changes in Reef health, responding to incidents, welcoming people and ensuring users understand and are compliant with the rules.

In 2018, the Australian Government provided \$6 million for the concept feasibility phase of a Reef Restoration and Adaptation Program (RRAP), a long-term research project to investigate the best science and technology options to help the Great Barrier Reef resist, repair and recover. The Australian Government is also contributing a further \$100 million for Reef restoration and adaptation science, as a component of the \$443.3 million Reef Trust Partnership via the Great Barrier Reef Foundation. This innovative partnership builds on the significant efforts to date of the Australian and Queensland governments and other partners to improve the health of the Reef and work towards delivering Reef 2050 Plan outcomes.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes.

Aichi Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Aichi Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification, are minimized, so as to maintain their integrity.

Aichi Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes.

Measure taken has been partially effective

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The two key advisory bodies established under the Plan—the Independent Expert Panel and the Reef Advisory Committee—advised the Ministerial Forum that urgent action is required to accelerate efforts to reduce pressures and impacts from all sources to improve the Reef’s resilience. Both the Panel and the Committee confirmed in their analysis that the Plan remains the right framework for achieving this outcome.

The Plan provides for an adaptive management framework investigating a broad range of actions to address various known threats and impact scenarios. Since 2015, an update on progress report, two annual reports and a mid-term review in 2018 indicate early progress in implementing the Plan but no assessment of effectiveness is available at this stage.

The mid-term review provided early indication of progress resulting from investments targeting on-ground action, which have influenced change in land use practice and contributed to reduce pollutant loads. The Reef Water Quality Report Card for 2017 and 2018, published in 2019, sets out progress towards achieving the finer-scale water quality targets for the 35 major rivers that flow into the Great Barrier Reef, and gives a clearer view of where actions have been successful. The Report shows that on-ground investments supporting farmers and graziers to improve their land management practices in catchment areas are making a difference. Poor water quality is a big, system-wide challenge. Whilst measures such as these contribute progress in improving the health and resilience of the Reef, the changes in land management needed require substantial investment and take time to implement—this means it can be years before results are seen on the ground.

The *Great Barrier Reef Outlook Report*, whilst published in 2019 by the Great Barrier Reef Marine Park Authority, delivers an assessment on the health of the Great Barrier Reef Region with consideration of protection and management activities delivered over the period 2014–2018. Similarly, *The Independent assessment of management effectiveness for the Great Barrier Reef Outlook Report 2019* found that across almost all management topics (those addressed directly by the Reef 2050 Plan and existing well established management frameworks), the effectiveness of existing measures is rated as good or very good, and stable or improving. Nonetheless, the extensive investment, management action, and policy and regulatory changes delivered under the Reef 2050 Plan are yet to translate into measurable improvement in outcomes against some management topics that are more complex and where outcomes take long periods to achieve. The independent management effectiveness review observed that ‘achieving outcomes on the ground continues to be difficult for complex and spatially broad topics such as climate change, land based run-off and biodiversity.’

Australia’s latest State Party Report on the state of conservation of the Great Barrier Reef World Heritage Area was submitted to the World Heritage Committee on 29 November 2019.

Relevant websites, web links and files

Reef 2050 Long Term Sustainability Plans, supporting policy documents, progress reports at:

<http://www.environment.gov.au/marine/gbr/long-term-sustainability-plan>

Great Barrier Reef Marine Park Authority Crown of Thorns Starfish Control Program

<http://www.gbrmpa.gov.au/our-work/our-programs-and-projects/crown-of-thorns-starfish-control-program>

Great Barrier Reef Marine Park Authority water quality monitoring

<http://www.gbrmpa.gov.au/our-work/reef-strategies/reef-integrated-monitoring-and-reporting-program/water-quality>

Great Barrier Reef Outlook Report 2019

<http://hdl.handle.net/11017/3474>

Great Barrier Reef Outlook Report 2019, Chapter 10–Long term outlook

<http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3474/9/Outlook-Report-2019-Chapter10.pdf>

Reef 2050 Integrated Monitoring and Reporting Program

<http://www.gbrmpa.gov.au/our-work/reef-strategies/reef-integrated-monitoring-and-reporting-program>

Independent assessment of management effectiveness for the Great Barrier Reef Outlook Report 2019

<http://elibrary.gbrmpa.gov.au/jspui/handle/11017/3475>

Reef 2050 Plan insights report: to inform the 2019 Outlook Report: Report to the Great Barrier Reef Marine Park Authority

<http://elibrary.gbrmpa.gov.au/jspui/handle/11017/3479>

[State Party Report on the state of conservation of the Great Barrier Reef Heritage Area (Australia) 2019

<https://www.environment.gov.au/heritage/publications/state-party-report-gbr-2019>]

Reef 2050 Water Quality Improvement Plan

<https://www.reefplan.qld.gov.au/>

Reef Restoration and Adaptation Program

<https://www.gbrrestoration.org/>

Traditional Use of Marine Resources Agreements

<http://www.gbrmpa.gov.au/our-partners/traditional-owners/traditional-use-of-marine-resources-agreements>

NESP Tropical Water Quality Hub

<https://nesptropical.edu.au/>

Other relevant information

Further information on actions to assist the Great Barrier Reef, including case studies, see section IV.

Obstacles and scientific and technical needs related to the measure taken:

Concerted global action to limit global warming is needed to turn around the deteriorating outlook for the Great Barrier Reef—and coral reefs globally. This is the context in which Australia manages the Great Barrier Reef. Australia is actively managing the pressures over which it has direct control through investment and regulation based on the best available science. In addition to climate change and crown-of-thorns starfish, the key threats to the Reef are land-based run off, coastal land use change and some aspects of direct human use such as illegal fishing.

Programs and actions to reduce impacts on the Great Barrier Reef have required large-scale investment and cooperation between the Australian and Queensland governments, and have engaged the participation and input from a broad range of experts, Indigenous peoples and local communities and industry to ensure actions are undertaken cohesively and are targeted appropriately.

For example, reducing sediment and nutrient loads has involved sugar cane growers and pastoralists in the hinterland in programs aimed at improving land management practices. Scientific experts have been researching corals and seagrasses, which form an integral part of the Reef, and determining ways to assist the

Reef's biodiversity to persist. Working with Indigenous groups has been essential to learn about and participate in managing sea country, as well as patrolling areas of the Reef to ensure sustainable use of biological resources. The tourism industry is involved in informing visitors about the Reef's biodiversity and allowing people to access this special place.

The final chapter of the Great Barrier Reef Outlook Report (Chapter 10) considers the risk findings as part of the overarching assessment of the Reef's future long-term outlook and mentions some of the existing and future initiatives to support the Reef's resilience. This includes work in the Marine Park such as enhanced compliance and effective Reef restoration and intervention, as well as accelerated action to improve agricultural land management practices across the catchments.

Undertaking ongoing resource intensive monitoring of the various programs and actions in place into the long-term will continue to be a challenge for management of the Reef. The Plan commits to ongoing measures to integrate monitoring of sediment and nutrient loads, water quality improvements, ecosystem health for inshore and outlying reefs and seagrass requiring a sustained level of coordination to support technical and scientific needs.

Measure 5: Harnessing Traditional knowledge

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan.

Indigenous Australians are increasingly active in both public and private sector programs and activities delivering biodiversity conservation and traditional use management, contributing skills and knowledge to manage issues relating to species, ecosystems of land and sea country and cultural heritage. Their contribution is delivering significant and profound benefit across the range of national and global biodiversity targets.

At the national level two statutory committees established under the EPBC Act, have integrated Indigenous perspectives and interests through their member constitution. These include the Indigenous Advisory Committee (IAC) and the Threatened Species Scientific Committee (TSSC). The IAC was established to provide advice to the national Minister for Environment and the Australian Government on policy and implementation matters relating to Indigenous land and sea management, specifically in relation to the EPBC Act implementation. The IAC has contributed advice ensuring recognition of and support for the transfer and integration of Indigenous traditional knowledge with national biodiversity policy, programs and regulatory decision processes. The TSSC has engaged member expertise to improve Indigenous engagement and understanding relating to the onground implication of their decisions on Indigenous Australians.

The IAC and TSSC have updated their protocols guiding engagement between the two committees. The protocols help to strengthen the integration of Indigenous perspectives into the research, listing and recovery planning processes for threatened species and ecological communities and support co-design initiatives enabling traditional knowledge input in the development of threatened species recovery plans. The IAC has also provided input to revisions to the national biodiversity strategy, development of the second phase of the National Landcare Program, National Land and Sea Manager Network, Indigenous Protected Area program and the various indigenous engagement approaches progressed by the National Environment Science Program, *Reef 2050 Long-term Sustainability Plan* and Emissions Reduction Fund.

The National Environmental Science Program (NESP) has embraced collaboration with Indigenous peoples, recognising traditional knowledge as a highly valued component of research and identifying Indigenous engagement as a priority for the design of NESP projects in the six research hubs¹. The *NESP Indigenous Engagement and Participation Strategy Guidelines* provide the overall approach for engagement with Indigenous peoples and local communities in all aspects of NESP research activity. Each Hub has developed an Indigenous engagement strategy outlining opportunities for Indigenous collaboration, employment, skills transfer, knowledge sharing, and increased cultural awareness among all partners.

As a result NESP Indigenous research partnerships and co-designed projects enhance the transfer of traditional knowledge and reinvigorate cultural practices, often complementing and supporting other biodiversity conservation related measures including the *Threatened Species Strategy*, *Reef 2050 Long Term*

Sustainability Plan, Indigenous Protected Areas, Indigenous Rangers Working on Country program and threatened species recovery planning activities. The following activities support the transfer and integration of traditional knowledge into conservation practice.

- The NESP Threatened Species Recovery Hub projects integrate traditional knowledge with on-ground action to support recovery of threatened birds, mammals and plants, adopting innovative solutions to manage threats that often also impact cultural values of local communities. The hub has also appointed an Indigenous Reference Group to provide guidance and advice on their biodiversity related research activities, helping to identify connections for future collaborations and Indigenous-led science.
- The NESP Northern Australia Environmental Resources Hub projects link with Indigenous land management activities across significant regions in northern Australia, often where Indigenous Protected Areas, other Indigenous managed lands, and high value environment assets are located. The hub is supporting effective knowledge brokering between Top End land and water managers and efforts to share lessons learned, particularly relating to Indigenous knowledge in fire management, adaptive land management and carbon abatement planning nationally.
- The NESP Tropical Water Quality Hub projects are strengthening partnership arrangements to increase participation of Traditional owners in the management and monitoring of Queensland's sea country, with learnings informing implementation of the Reef 2050 Plan. It has also partnered with the Torres Strait Regional Authority's (TSRA) Land and Sea Management Unit, through its Environmental Management Program, to provide research support to the 14 community based dugong and turtle management plans in the Torres Strait region. These plans aim to: promote community control and empowerment; respect cultural values and traditional knowledge; conserve natural and cultural values of their management area; and utilise two way management through mutual investigation and implementation of Western and Indigenous systems of knowledge.
- Most NESP hubs and national threatened species recovery planning activities are increasingly engaging partnerships with the Indigenous ranger groups who are working on country, supported of the Indigenous Rangers (formerly the Working on Country program) and Indigenous Protected Areas programs². These two programs continue to deliver meaningful employment and career pathways for Indigenous Australians, in particular in remote and regional Australia. Indigenous rangers combine traditional knowledge with conservation training to protect and manage their land, sea and culture. NESP extends this knowledge by engaging participation and applying traditional practice to field research, monitoring, trials and healthy country management. Various project outputs contribute to ongoing learning, sharing of knowledge and increasing capacity for healthy country management through communication materials and guides, workshops and management tools.
- The draft Greater Bilby Recovery Plan was developed in partnership with more than 20 Indigenous Ranger groups who identified feasible actions at key sites to address threatening processes based on a combination of local expertise, traditional knowledge and western science. Approximately 80 per cent of the remaining wild bilbies occur on Indigenous-managed lands, and their conservation is of cultural and ecological significance to keeping country healthy.
- At the Karajarri Indigenous Protected Area (IPA), covering 2.4 million hectares in north-west Australia, Indigenous rangers are using aerial burning to manage fire over large areas and collaborating with the NESP Threatened Species Recovery Hub to establish a monitoring program to measure benefits of burning for threatened species especially the bilby and princess parrot.
- In Australia's desert regions, arid zone ecologists with the Threatened Species Recovery Hub are blending Indigenous tracking skills with ecological science. Over 40 Indigenous ranger groups are using sand-plot surveys to monitor the presence of animals, track changes over time, and identify important environmental conditions for key species. Over 7000 surveys have been carried out across almost two-thirds of Australia and the data will be used to help Indigenous people manage biodiversity on their country.
- Indigenous ranger groups are exchanging and sharing their skills and knowledge with other groups across the country and globally, making links with research, education, philanthropic and commercial organisations, engaging with schools, and generating additional income and jobs in biosecurity, heritage and other sectors. Where they also have a biosecurity function (such as in collaboration with the Northern

Australian Quarantine Strategy) traditional knowledge regarding the prevalence and characteristics of particular plant and animal species is harnessed to identify new species in the region and monitor plant and animal health enabling greater protection and management of biodiversity and traditional culture.

- An example at the state level is a NSW Environmental Trust funded project that has researched and applied traditional ecological knowledge and Aboriginal cultural values to the benefit of local Mallee environments and threatened species in south-western NSW. The resulting new approaches to measuring biodiversity change being explored integrate multiple dimensions of biodiversity.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes.

Aichi Target 18: By 2020, the traditional knowledge, innovations and practices of Indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of Indigenous and local communities, at all relevant levels.

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes.

Measure taken has been partially effective

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

Various program evaluations and research evidence demonstrates the full suite of benefits derived from the process of integrating traditional knowledge and practice into biodiversity conservation activities. Indigenous Ranger-Working on Country and Indigenous Protected Areas programs have been very successful in engaging and involving Indigenous peoples in land management, both to conserve biodiversity and as a way to protect their culture.

Traditional fire practice has extended into management regimes across Australia, learning from the experience of the northern Australian savanna burning in the early dry season to reduce late dry season hot fires. Indigenous rangers are now involved in planned burns in the Australian Capital Territory and traditional fire practices are being applied in Central Victoria and New South Wales. An international savanna fire management project is taking Australia's knowledge of Indigenous fire management to the world, with a pilot project involving the Kimberley Land Council Indigenous rangers working with Botswana communities. Indigenous rangers who are integral to the monitoring of threatened species, such as the bilby in Central Australia, are sharing their experience and knowledge with others.

Work is ongoing to improve Indigenous participation in land management and biodiversity conservation. Successful programs rely on opportunities to provide ongoing employment, as well as knowledge exchange and cultural learning, particularly with young Indigenous peoples who may not have previously spent time on their country. More traditional knowledge is slowly being integrated into biodiversity and land management programs, and with strong and positive results, particularly in the face of the challenges of drought, fire and climate change.

NESP Research Hubs monitor research activities against performance indicators relating to Indigenous engagement and participation in research projects, tracking how the views and traditional knowledge of Indigenous peoples and local communities are incorporated in research, identifying the co-benefits of that knowledge exchange, what employment opportunities have been realised and how research outcomes will benefit Indigenous peoples and local communities.

In 2018:

- over 100 Indigenous people were employed on NESP research projects, and over 450 Indigenous people trained in the use of biodiversity management tools and techniques on country
- there were 120 active Indigenous ranger groups, and combined with the Indigenous Protected Area program, over 2900 Indigenous Australians employed in land and sea country management ranger positions.

Relevant websites, web links and files

Map of Indigenous Protected Areas and Indigenous Ranger Groups

<https://www.niaa.gov.au/sites/default/files/files/ia/IEB/ipa-national-rangers-map.pdf>

Indigenous rangers working on country

<https://www.niaa.gov.au/indigenous-affairs/environment/indigenous-rangers-working-country>

Social return on investment – consolidated report on Indigenous Protected Areas

<https://www.niaa.gov.au/sites/default/files/publications/SROI-Consolidated-cover.jpg>

National Environmental Science Program

<https://www.environment.gov.au/science/nesp/about>

Indigenous Collaboration for Australia's environmental science

<https://www.environment.gov.au/science/nesp/publications/indigenous-collaboration-australia-environmental-science-brochure>

NESP Clean Air and Urban Landscapes Hub – Indigenous engagement program

<https://nespurban.edu.au/about/indigenous-engagement/>

NESP Earth Systems and Climate Change Hub – Science Impact Indigenous Communities

<http://nespclimate.com.au/indigenous-communities/>

NESP Northern Australia Environmental Resources Hub – Indigenous NRM

<https://www.nespnorthern.edu.au/topics/indigenous-nrm/>

NESP Northern Australia Environmental Resources Hub – Indigenous Science Partnerships

<https://www.nespnorthern.edu.au/wp-content/uploads/2018/10/Hub-Indigenous-science-partnerships.pdf>

NESP Marine Biodiversity Hub – Sea country research and Indigenous Engagement

<https://www.nespmarine.edu.au/news/sea-country-research-exploring-successes-and-challenges-indigenous-engagement>

NESP Tropical Water Quality Hub - Indigenous rangers trained in managing mangroves

<https://nesptropical.edu.au/index.php/2019/07/01/indigenous-rangers-trained-in-managing-mangroves-on-their-country/>

NESP Threatened Species Recovery Hub Indigenous Engagement activities

<http://www.nespthreatenedspecies.edu.au/news/indigenous-engagement-vital-to-saving-species>

NESP Threatened Species Recovery Hub Indigenous collaboration in threatened species research

http://www.nespthreatenedspecies.edu.au/_images/ResearchThemes/6.2_Indigenous%20Collaboration%20Factsheet_V4.pdf

NESP Threatened Species Hub – Contemporary and Traditional fire management approaches

<http://www.nespthreatenedspecies.edu.au/projects/contemporary-and-traditional-fire-management-approaches-in-the-desert>

NESP Threatened Species Hub – Arid zone monitoring with Indigenous tracking

<http://www.nespthreatenedspecies.edu.au/projects/arid-zone-monitoring-surveys-for-vertebrates-across-arid-and-semi-arid-zones>

NESP Northern Australia Environmental Resources Hub – Indigenous NRM

<https://www.nespnorthern.edu.au/topics/indigenous-nrm/>

NESP Northern Australia Environmental Resources Hub – Indigenous Science Partnerships

<https://www.nespnorthern.edu.au/wp-content/uploads/2018/10/Hub-Indigenous-science-partnerships.pdf>

Cultural Burning Strategy – Forest Fire Management Victoria

<https://www.ffm.vic.gov.au/fuel-management-report-2017-18/topics-of-interest/cultural-burning-strategy-case-study>

Cultural Fire Management Policy – NSW National Parks and Wildlife Service

<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Fire/cultural-fire-management-policy-160504.pdf>

NSW Local Land Services ‘Innovate Reconciliation Action Plan’ May 2018

https://greatersydney.lls.nsw.gov.au/_data/assets/pdf_file/0009/815193/LLS-Innovate-RAP.pdf

Threatened Species Strategy Year Three Report

<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>

Torres Strait Sea Rangers Dugong and Turtle Management Program

<http://www.tsra.gov.au/the-tsra/programmes/env-mgt-program/our-projects>

Northern Australia Quarantine Strategy

<https://www.agriculture.gov.au/biosecurity/australia/naqs>

Other relevant information

¹ NESP supports six themed research hubs including: Clean Air and Urban Landscapes Hub; Marine Biodiversity Hub; Threatened Species Recovery Hub; Earth Systems and Climate Change Hub; Northern Australia Environmental Resources Hub; Tropical Water Quality Hub. More details on the work of NESP is detailed in sections IV-V.

²Indigenous Protected Areas are areas of land and sea country owned or managed by Indigenous groups, which are voluntarily managed as a protected area for biodiversity conservation through an agreement with the Australian Government. Indigenous Protected Areas are an essential component of Australia’s National Reserve System, which is a network of formally recognised parks, reserves and protected areas.

Obstacles and scientific and technical needs related to the measure taken:

The majority of engagement with Indigenous rangers and their local Indigenous communities directing traditional cultural practice to support conservation activities occurs in remote parts of Australia, presenting logistical and funding challenges. Groups are increasingly utilising web-based tools to share and exchange information but more can be done to enhance this capability.

Returns on investment of Indigenous involvement has been substantial, with ongoing employment and capacity building, as well as knowledge exchange being some of the many benefits that flow from these programs. In particular, some of our most vulnerable mammal species are now benefiting from ongoing monitoring through the work of these groups, and larger areas of land subject to invasive animals and weeds are now being more cohesively managed. Despite the logistical and financial obstacles, enabling ongoing opportunities for Indigenous involvement will continue to benefit both Indigenous peoples and local communities together with the biodiversity they are protecting.

III. ASSESSMENT OF PROGRESS TOWARDS EACH NATIONAL TARGET

This section presents Australia's general progress towards the 10 interim national targets identified in *Australia's Biodiversity Conservation Strategy 2010–2030* (the Strategy) with information on the range of activities and achievements that contributed to specific and collective targets over the report period, where appropriate.

Many of Australia's biodiversity related programs and initiatives were designed to take account of the full suite of national priorities and it was unusual for a national biodiversity related program to contribute only to one of the national targets. This is due to the interconnected nature of the targets, in many cases, a single program may contribute to multiple targets and the report identifies the range of targets to which the program or group of activities relate. This alignment across the range of targets demonstrates the strength of Australia's approach to integrate programs with national and global targets.

As outlined in section I, in addition to examining the operation and implementation of the Strategy, the 2016 review report assessed the measurability of the 10 interim national targets. A key finding of this analysis was that, for most of the Strategy's national targets, progress could not be adequately measured.

Evaluating and reporting on the achievement of the Strategy's targets relies on aggregating data and input from multiple sources (for example, data from multiple national and sub-national governments and agencies, and relevant non-government organisations across the country), to enable the reporting of national-scale assessments of environmental condition and trends. This requires the establishment of national-scale datasets and the development of a national platform which draws together the policies and programs delivering biodiversity outcomes across the country.

Some National Targets such as Target 5—*By 2015, 100 km² of fragmented landscapes and aquatic system are being restored to improve ecological connectivity* are easily measurable, and have a physical and tangible measure that other targets do not have, such as Target 3—*Achieve a doubling of the value of complementary markets for ecosystem services*. While there are some examples of progress being made in achieving these targets, the lack of any tangible means to measure the effectiveness of targets in delivering improvements has limited the capacity to report on achievements. This means the assessment of progress towards the targets, at the national level, requires the utilisation of a different approach to measuring achievement and effectiveness.

Significant progress is being made to address these issues through improvements to processes underpinning the state of the environment reporting, the development and implementation of a national approach to environmental-economic accounting in Australia and a shift in how future achievements will be measured by *Australia's Strategy for Nature 2019–2030*.

In the revised strategy progress measures form the primary mechanism for reporting on the goals and objectives in the strategy. A national working group, comprised of officials from all Australian national and sub-national environment departments and the Australian Local Government Association, will track the strategy's implementation through the progress measures outlined for each objective.

Examples of national programs, strategies and initiatives

At a whole-of-landscape scale, a range of national investment programs and policy initiatives have continued to address multiple national targets. These programs and initiatives facilitate a variety of on-ground and outcome-focussed activities, such as management of invasive plants and animals, protection of threatened species, conservation of existing natural resources, and community engagement and education.

Below is a selection of the programs and initiatives operating between 2014 and 2018.

Indigenous Protected Area (IPA) and Indigenous Ranger Program – National Targets 2, 4, 5, 7

Australia's IPA program continues as an effective program assisting Indigenous communities to voluntarily dedicate their land or sea country as Indigenous Protected Areas. A core component of the program is the promotion of balance between conservation and other sustainable uses to deliver social, cultural and economic benefits for Indigenous peoples and local communities

(<https://www.environment.gov.au/land/indigenous-protected-areas>).

The Indigenous Ranger Program supports Indigenous peoples and local communities integrate their traditional knowledge with conservation actions and encourages the sharing of knowledge. It promotes the passing of traditional knowledge from community elders to younger generations enhancing cultural connections (<https://www.pmc.gov.au/indigenous-affairs/environment/indigenous-rangers-working-country>).

Combined, these programs have increased Indigenous participation and employment (National Target 2), while also contributing to targets related to the protection of diversity (National Target 4), maintenance of ecosystem services (National Target 5) and the reduction of threats to biodiversity (National Target 7).

Achievement in the reporting period to December 2018:

- 13 new dedicated IPAs since January 2014
- a total of 75 IPAs dedicated in seven of the eight sub-national jurisdictions, except the Australian Capital Territory
- IPAs protect more than 67 million hectares of land, being 44 per cent of Australia's National Reserve System
- 67 per cent of IPA funded projects were also supported by Australian Government funded Indigenous ranger groups
- a total 120 Indigenous ranger groups funded to support IPAs and other Indigenous owned and managed lands nationally
- commitment of \$15 million in 2017 to assist Indigenous groups undertake consultation and planning to identify new IPAs, with five new consultation projects initiated in 2018 and a further seven announced in 2019 likely to result in IPA dedications
- a further boost to investment of \$250 million to support employment of Indigenous rangers across the nation under the Australian Government Indigenous Advancement Strategy over period 2018 to 2021.

Reef 2050 Long Term Sustainability Plan (Reef 2050 Plan) and the Reef Trust–National Targets 1, 4, 5, 7

As detailed in section II (measure 4) the *Reef 2050 Plan* was updated and released by the Australian and Queensland governments in mid-2018. Building on the original document released in 2013, the revised Plan contributes to the overarching framework for protecting and managing the Great Barrier Reef with concrete management measures set for the next 35 years (<https://www.environment.gov.au/marine/gbr/long-term-sustainability-plan>).

The Reef Trust is the funding mechanisms to support implementation of the *Reef 2050 Plan* and is focussed on consolidating investment across a wide range of sources and seeking to complement existing Great Barrier Reef investment. The Reef Trust delivers innovative, targeted investments in critical areas, such as improving water quality and coastal habitat along the Great Barrier Reef, controlling the current outbreak of crown-of-thorns starfish, and protecting threatened and migratory species, particularly dugong and turtles (<https://www.environment.gov.au/marine/gbr/reef-trust>).

Due to the terrestrial and marine focus of the *Reef 2050 Plan* and the investment mechanisms that underpin the delivery, actions align across a range of National Targets, including – increasing engagement and participation in biodiversity conservation activities (National Target 1); increasing the value of complementary markets for ecosystem services (National Target 3); increasing habitat managed primarily for biodiversity (National Target 4); restoration of fragmented landscapes and aquatic systems to restore ecological connectivity (National Target 5); and reducing the impact invasive species have on threatened species (National Target 7). In addition to investment to deliver on-ground action, nationally focussed strategies and management approaches also contribute to progress towards our 10 National Targets. These strategies cover the terrestrial and aquatic biodiversity across a range of habitats and environments.

Commonwealth Environmental Water Holder – National Targets 1, 2 and 5

The Australian Government is recovering water to restore the health of Australia's longest river basin—the Murray-Darling Basin. This water is managed by the Commonwealth Environmental Water Holder (CEWH) with the primary purpose of protecting and restoring the health of the Basin's rivers, wetlands and floodplains, and the native flora and fauna that are dependent on these ecosystems. By 1 July 2018, the CEWH was managing water entitlements of over 1850 gigalitres/year (worth over \$3 billion) and in the four year reporting period (2014–2018), delivered almost 5000 gigalitres of environmental flows to benefit

aquatic biodiversity across the Murray-Darling Basin, such as the supporting spawning, movement and recruitment of threatened native fish and breeding events for colonial-nesting waterbirds, contributing to restore and connect aquatic ecosystems of National Target 5. The program is reliant on high-levels of engagement with and participation from local communities, Traditional owners and scientists (National Targets 1 and 2).

Australian Marine Parks – National Targets 1 and 4

On 1 July 2018, five new management plans for Australian Marine Parks commenced, bringing around 2.3 million square kilometres of ocean under new marine park management arrangements. Since then, all 58 Australian Marine Parks, covering around 2.8 million square kilometres are managed under statutory management plans.

Managing these marine parks helps to protect and conserve biodiversity and other natural, cultural and heritage values of the parks, while allowing people to utilise natural resources in the parks in an ecologically appropriate and sustainable way. Marine park management plans also contribute to increasing the native habitat being primarily managed for biodiversity (National Target 4), and to increasing public awareness and understanding of the management of marine parks and the benefits they provide (National Target 1) (<https://parksaustralia.gov.au/marine/news/new-management-plans-1-july/>).

Northern Australia Quarantine Strategy – National Targets 1, 2 and 7

This Strategy operates along 10,000 kilometres of coastline, inlets and islands from Broome in the west to Cairns in the east. It aims to prevent the entry of alien pests, weeds and disease into northern Australia through surveillance, early detection and reporting. Delivered in collaboration with Aboriginal and Torres Strait communities it supports biosecurity surveillance with additional funds provided in 2015 under the *Developing Northern Australia White Paper* to expand the Indigenous ranger network to increase biosecurity surveillance, and engage communities to raise biosecurity awareness (see section II, measure 5).

National Strategy for Environmental-Economic Accounting – National Target 3 and 10

On 27 April 2018, national and sub-national environment ministers endorsed a strategy to deliver a common national approach to environmental-economic accounting in Australia. The *National Strategy for Environmental-Economic Accounting* will ensure that coherent, comprehensive and integrated accounts are built, and support public sector and business decision making at all levels—local, enterprise, region, state and national—and across all sectors. A common national approach to environmental-economic accounting is an agreement whereby the Commonwealth, state and territory governments, together with the broader community (including business, academia, natural resource management organisations and non-government organisations), collaborate to progress user-driven environmental-economic accounting.

This is not intended to dictate a mandatory approach or specific data requirements, but rather advocate for consistency in the principles and methods used for development of environmental-economic accounting. Sub-national governments will participate in the implementation of the common national approach as their capacity and interests allow.

A nationally consistent approach to environmental-economic accounting will assist with addressing current information gaps and bring together environmental and economic information in a coherent way, allowing comparisons and aggregation across jurisdictions.

The information provided by these accounts supports evidence-based environmental policy making, better targeted natural resource management, nationally consistent reporting on our environment, investment decisions and more sustainable practices across all sectors. It contributes towards our National Target 3 and 10—doubling the value of complementary markets for ecosystems services, as it provides for integration of ecosystem services into economic accounting and consistent national reporting.

National Wildlife Corridors – National Target 5 and 6

The *National Wildlife Corridors Plan*, completed in 2013, sets an approach to establish improved connectivity in the landscape by linking national parks, reserves and well-managed private land. A key component of the Plan is to build the resilience of Australia's environment by providing guidance on collaborative, whole-of-landscape approaches to conserving native plants, animals and other organisms. The Plan's connectivity principles and objectives continue to guide existing and new national policy and

programs for alignment with National Targets 5 and 6 supporting local, regional and continental scale linkages (<http://www.environment.gov.au/topics/biodiversity/biodiversity-conservation/wildlife-corridors/what-are-wildlife-corridors>).

The pursuit of connectivity in the landscape is demonstrated through:

- *Australia's Strategy for the National Reserve System* delivers a consistent theme for reserve planning and locations to promote ecological connectivity and ecosystem function and resilience
- natural resource management programs and initiatives including Indigenous Protected Areas, National Landcare Program's regional investments, 20 Million Trees and the Cumberland Conservation Corridor initiative setting priorities to support extension to conservation corridors and the restoration of functioning landscapes
- the Biodiversity Fund projects that supported 56 regional natural resource management organisations to update their regional plans during 2015, integrating climate change adaptation and biodiversity related actions including planning for ecosystem connectivity
- environmental flow programs in the Murray-Darling Basin (such as those delivered by the Commonwealth Environmental Water Holder) are improving the longitudinal connectivity (that is, flows along rivers) and lateral connectivity (the flow between rivers and adjacent wetlands and floodplains) across 20,000 km of river channel
- existing corridors and connectivity projects funded under previous national programs, such as the Biodiversity Fund and Caring for our Country, continue to be managed as connected landscapes.

Threatened Species Strategy, Recovery Fund and Prospectus – National Targets 1, 2, 3, 4, 5, 7, 8 and 10

As detailed in section II (measure 2) the Australian Government adopted the *Threatened Species Strategy* in July 2015 as the policy guiding its approach to protecting and recovering our nation's threatened plants and animals. The main aims are to engage the best scientists and use evidence-based decision making to ensure the actions chosen are the ones most likely to succeed; set out clear actions and hard measurable targets to direct action, and ensure accountability in actions taken; and building partnerships to use resources to their best effect in protecting and recovering threatened species.

The *Threatened Species Strategy* includes an Action Plan, which is the first instalment of a five-year Australian Government response. Key action areas that are priorities for the Australian Government are tackling feral cats; safe havens for species most at risk; improving habitat; and emergency intervention to avert extinctions. The Strategy has produced three annual reports on progress to date (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy>).

In 2016, the Minister for the Environment announced a \$5 million Threatened Species Recovery Fund to support communities to actively protect threatened species, leverage additional investment, and assist with delivering on the targets and action areas in the *Threatened Species Strategy*. The Fund builds on the Australian Government's commitment to supporting threatened species recovery through the Threatened Species Commissioner, and the implementation of the *Threatened Species Strategy* and Threatened Species Prospectus. It sits within the National Landcare Program and delivers tangible benefits for our threatened species, as well as helping to grow community involvement in their recovery.

The *Threatened Species Prospectus* encourages partnerships between government, industry, scientists, non-government organisations, Indigenous groups and communities to work collaboratively on threatened species projects. The prospectus aims to mobilise funding for a range of identified projects to meet targets to reduce threats, and protect and manage threatened species habitat (<https://www.environment.gov.au/biodiversity/threatened/species/threatened-species-prospectus>).

Both the *Threatened Species Strategy* and the prospectus have been successful in increasing awareness and participation in biodiversity conservation, including facilitating Indigenous employment opportunities (National Target 1 and 2); supporting private investment in conservation (National Target 3); increasing the area of native habitat managed primarily for biodiversity conservation across terrestrial and aquatic environments (National Target 4); in contributing towards restored fragmented landscapes and aquatic systems to improve ecological connectivity (National Target 5); and reducing the impacts of invasive species on threatened species and ecological communities in terrestrial and aquatic environments (National Target 7)

and applying best available science to establish priorities and promote long-term monitoring (National Target 8 and 10).

National Landcare Program – National Targets 1, 4, 5, 6, 7 and 10

The Australian Government National Landcare Program supports local environment and sustainable agriculture projects, as well as shared stewardship of the environment through investment in a range of locally focused environment programs that support practical action in urban, rural and regional communities.

The first phase of the National Landcare Program set strategic outcomes for directing investment, such as maintaining and improving ecosystem services through sustainable management of local and regional landscapes; increasing the number of farmers and fishers adopting practices that improve the quality of the natural resource base, and the area of land over which those practices are applied; increasing engagement and participation of the community, including Landcare, farmers and Indigenous peoples, in sustainable natural resource management; and increasing restoration and rehabilitation of the natural environment, including protecting and conserving nationally and internationally significant species, ecosystems, ecological communities, places and values. A review of the program in 2016 found that investment under the program:

- improved the condition of natural assets, reduced threats to native plant, animal species and iconic places, with more than 450 projects helping to protect these important environmental assets
- created strong and interconnected local and regional networks and organisations that have integrated conservation, community, farming and government priority interests
- increased the uptake of more sustainable land management practices, with more than 9.5 million hectares of land managed to improve natural resources and complement environmental outcomes
- engaged more than three million volunteers in land management projects and increased Indigenous involvement in natural resource management
- contributed to broadening regional scale collaborative natural resource management with 30 of the 56 regional bodies collaborating across regional boundaries to deliver projects.

The second phase of the National Landcare Program commenced in July 2018, with an additional \$1 billion over five years to June 2023 to continue investment in natural resource management, sustainable agriculture, and to protect Australia’s biodiversity. By the end of 2018, a total of \$414 million of the Regional Land Partnerships component of the program invested in a range of projects that will coordinate long-term actions to protect threatened ecological communities, restore the globally-important Ramsar wetlands, and support recovery efforts for species identified under the *Threatened Species Strategy*. Funding is also aimed at increasing the capacity of farms to adapt to climate change, evolving market demands and to help farmers improve soil health on farms, targeting soil acidification, wind erosion and hillslope erosion.

Overall, the Program contributes support towards progressing National Target 1—an increase in the number of Australians, and public and private organisations, who participate in biodiversity conservation activities; National Target 4—an increase in native habitat managed primarily for biodiversity conservation across terrestrial, aquatic and marine environments; National Target 5—restoration of fragmented landscapes and aquatic systems to improve ecological connectivity; National Target 7—reduce the impacts of invasive species on threatened species and ecological communities in terrestrial, aquatic and marine environments; and National Target 10—contribution to national monitoring and reporting by the Monitoring, Evaluation, Reporting and Improvement Tool (MERIT), the program’s online national reporting tool designed to collect and store planning, monitoring and reporting data associated with natural resource management projects funded by the Australian Government.

The Green Army Program (2014-18) – National Target 1, 2, 5, 6, 7

The Australian Government’s hands-on, practical environmental action program engaged young Australians aged 17 to 24 years as participants, to complete on-ground projects that provided environmental or heritage conservation benefits to their local community. Each round was designed to achieve specific priorities in support of environmental, heritage and conservation outcomes aligned with national and international obligations. National priorities for protecting and conserving threatened species and/or ecological communities, migratory species, and regionally significant species, as well as their habitat was adopted by the Program to direct investment.

The Green Army Program delivered over 1255 projects across Australia that delivered 3086 targeted activities, of which 93 per cent successfully contributed to environmental outcomes, including: revegetation and plant propagation achieving 3.7 million plantings with many projects contributing to increase the area of linkages between (connectivity) and condition of Australia's native vegetation (National Target 5 and 6); weed removal and management activities treating over 154,000 hectares and 42,500 cubic metres of debris removed (National Target 7). The program priority outcome also contributed to National Target 1 and 2 to raise awareness and increase employment of Indigenous Australians, respectively (see section IV, Aichi target 1 for more on these achievements).

National Environmental Science Program – National Target 8

Further to detail in section II (measure 5) NESP is a long-term commitment to environmental and climate research with Australian Government funding of \$145 million over the six years from 2014–15 to 2020–21 financial years. The program builds on its predecessors, the National Environmental Research Program and the Australian Climate Change Science Programme, to support decision-makers to understand, manage and conserve our environment with the best available information, based on world-class science.

NESP delivers collaborative, practical and applied research that informs decision-making and on-ground action by partnering with policymakers, Indigenous people and industry whose decisions impact the environment. Accordingly, the program has a very substantial public communications and knowledge-brokering dimension. The program recognises the critical role of Indigenous peoples and organisations in shaping and undertaking research. By funding science initiated on collaborative expectations and focusing on high-level priorities, NESP is leading to outcomes that are accessible to the range of stakeholders. Research delivered through the NESP provides science for evidence based policy and decision-making.

NESP is key to Australia moving towards National Target 8—nationally agreed science and knowledge priorities for biodiversity conservation to guide research activities with the activities of all Hubs also contributing to most of the National Targets. For further information <https://www.environment.gov.au/science/nesp/about>.

National Offshore Petroleum Safety and Environment Management Authority – National Target 9

The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) is Australia's independent expert regulator for health and safety, environmental management, structural and well integrity for offshore petroleum facilities and activities in Commonwealth waters. Originally established in 2005 as the National Offshore Petroleum Safety Authority (NOPSA), the name was changed to NOPSEMA in January 2012, when regulation of offshore environmental management and well integrity was added.

In February 2014, NOPSEMA became the sole Commonwealth environmental management regulator for offshore oil and gas activities, when the Commonwealth Minister for the Environment endorsed NOPSEMA's environmental management authorisation process under the EPBC Act.

NOPSEMA's Environment Division is responsible for ensuring that all offshore petroleum and greenhouse gas activities in Commonwealth waters are undertaken in accordance with the *Offshore Petroleum and Greenhouse Gas Storage Regulations 2009* (Environment Regulations). The Environment Regulations seek to ensure that every offshore petroleum activity in Commonwealth waters is carried out in a manner that is consistent with the principles of ecologically sustainable development so that the environmental impacts and risks of the activity will be acceptable, and reduced to as low as reasonably practicable.

To ensure the Environment Regulations are adhered to, NOPSEMA undertakes assessment and compliance monitoring activities and also encourages leading practice on the management of environmental risks in the offshore industry. The combination of the regulation of safety, well integrity, and environmental management under a single independent regulator aims to standardise Australia's offshore petroleum regulation to a quality, best practice model. This contributes towards National Target 9—review relevant legislation, policies and programs to maximise alignment with *Australia's Biodiversity Conservation Strategy 2010–2030*.

Australia State of the Environment (SoE) 2016 – National Target 10

Every five years the Australian Government conducts a comprehensive review of the state of the Australian environment, resulting in the SoE reporting series. These reports provide information about environmental

and heritage conditions, trends and pressures for the continent's land, biodiversity, surrounding oceans, coasts, external territories, atmosphere and built environments.

The SoE 2016 updates assessment presented in SoE 2011, including filling some gaps, reporting new and emerging issues, and presenting alternative scenarios on the outlook for Australia's environment into the future. The addition of the innovative SoE 2016 digital platform significantly enhances the value of this reporting, enabling a broad range of stakeholders—from decision-makers, to researchers and interested members of the public—greater capacity to understand the current condition of our unique environment, the risks to that environment, and protective measures, as well as improvements and concerns.

Both SoE and the *National Strategy for Environmental-Economic Accounting* are key examples of progress towards a national long-term systems for biodiversity monitoring and reporting (National Target 10).

National Flying-Fox Monitoring Program – National Target 10

The National Flying-Fox Monitoring Program (NFFMP) began in 2012, a multi-year monitoring program resulting from a collaboration between national and sub-national governments, and the Commonwealth Scientific Industrial and Research Organisation (CSIRO). The CSIRO has developed a scientifically rigorous monitoring methodology to gather updated information about the status of the national Grey-headed Flying-fox population and population trends. Using the CSIRO methodology, the NFFMP is focused primarily on monitoring national Grey-headed and Spectacled Flying-fox populations, however within the range of these two species, counts of Black and Little Red Flying-foxes are also undertaken.

An interactive Flying-fox web viewer has been developed to visually present the camp census data collected via the NFFMP. The viewer shows the camp locations of Grey-headed and Spectacled Flying-foxes. Within the eastern coastal belt of Australia, the viewer also shows Black Flying-fox and Little Red Flying-fox camps. The Grey-headed and Spectacled Flying-fox are listed as threatened under the EPBC Act. The viewer allows users to explore Flying-fox camps and the numbers of each species counted over time.

This information spans the data gathered from November 2012 to present. Reports of counts under the NFFMP are published online, once the data has been checked and analysed (<https://www.environment.gov.au/biodiversity/threatened/species/flying-fox-monitoring>). This provides a central location for key data on flying-fox aggregations that can be used to assist in planning for camp management as required, and contributes towards National Target 10 on national long-term biodiversity monitoring and reporting.

Examples of sub-national programs and initiatives

At the sub-national level, state, territory and local governments across Australia have engaged with the review of *Australia's Biodiversity Conservation Strategy 2010–2030*, and some have actioned revisions to their own jurisdiction's biodiversity policies and related legislation to align with Australia's national framework, with progress toward National Target 9. Sub-national level initiatives have successfully contributed progress across all 10 interim national targets with some examples below.

Alignment of Victoria's legislation and policies – National Targets 1, 5, 7, 9

The Victorian *Our Catchments, Our Communities Strategy* encourages integrated catchment management delivered by regional catchment management authorities, regional partners and local communities. Incorporating the coordinated management of land, water and biodiversity through fencing, revegetation and the control of invasive species, these projects deliver improvements to the health of waterways and catchments, and contribute to implementing Victorian Regional Catchment Strategies (<https://www.water.vic.gov.au/waterways-and-catchments/our-catchments/our-catchments-our-communities>).

In 2017, Victoria released *Protecting Victoria's Environment - Biodiversity 2037*. The vision and goals of the Biodiversity Plan are consistent with those of the Convention on Biological Diversity and of the *Australia's Biodiversity Conservation Strategy 2010–2030*, aligning with the three main priorities: engaging all Australians in biodiversity conservation; building ecosystem resilience in a changing climate; and getting measurable results. The Biodiversity Plan establishes priorities for action, and clear targets that will support the Victorian Government to align its specific priorities and investments within a broader national context (<https://www.environment.vic.gov.au/biodiversity/biodiversity-plan>).

The Victorian Government has also reviewed its *Flora and Fauna Guarantee Act 1988* and introduced a Bill to amend the Act to the Victorian Parliament in May 2018. An Amendment Bill was passed in 2019 and set to

come into effect in 2020, with the aim to improve the efficiency and effectiveness of conserving Victoria's flora and fauna (<https://engage.vic.gov.au/review-flora-and-fauna-guarantee-act-1988>). A new *Marine and Coastal Act 2018* came into effect on 1 August 2018 replacing the Victorian *Coastal Management Act 1995*. The new Act will provide a simpler, more integrated and coordinated approach to ecologically sustainable policy, planning and decision making (<https://www.marineandcoasts.vic.gov.au/marine-and-coastal-act>).

A thorough review of the Victorian Native Vegetation Regulations was also finalised, resulting in better protection for Victoria's sensitive native vegetation, enhanced operation of the regulations and increased transparency. The review established better outcomes relating to accounting for the environmental value of large scattered trees, endangered vegetation types and sensitive wetlands and coastal areas in decision making; allowing some site-based information to supplement mapped information, and ensuring the information used in the regulations better reflects the vegetation on the ground; and improving monitoring and reporting on native vegetation removal and offsets. The review outcomes were informed by extensive consultation with the community and stakeholder groups (<https://www.environment.vic.gov.au/native-vegetation/review-of-native-vegetation-clearing-regulations>).

Queensland's planning frameworks and community grants – National Targets 1, 4, 5, 7

In 2017, the Queensland Government introduced stronger planning protections for biodiversity corridors, to protect landscape scale connections which link areas of habitat and facilitate safe movement of wildlife, to allow genetic flow across the landscape, and to promote ecosystem resilience.

The *State Planning Policy 2017* introduced stronger protections for biodiversity corridors throughout Queensland. The policy specifically requires that planning and development outcomes must ensure that ecological processes and connectivity are maintained or enhanced, by avoiding fragmentation of matters of environmental significance (national, state and local) (<https://dilgpprd.blob.core.windows.net/general/spp-july-2017.pdf>).

Recognising the high biodiversity value in south-east Queensland, the *Shaping SEQ – South East Queensland Regional Plan 2017* (Shaping SEQ) also introduced stronger protections for biodiversity corridors, from the impacts of regional development. Shaping SEQ recognises the need to identify and protect natural assets, to build resilience in habitats and species to deal with climate impacts, and to re-connect wildlife habitat corridors across the landscape. Shaping SEQ includes biodiversity strategies, including to avoid fragmentation of regional biodiversity corridors, and to rehabilitate degraded areas to maintain habitat and support fauna movement (<https://dilgpprd.blob.core.windows.net/general/shapingseq.pdf>).

The Queensland Government's Everyone's Environment Grants Program is providing funding to local and school groups, Landcare and conservation organisations, heritage owners and caretakers, and research institutions to undertake small-scale projects focussed on the themes of conservation, heritage and urban wild spaces, with activities including tree planting, and the removal of rubbish and invasive weeds. To date the program has provided support to 308 organisations and over 16,000 volunteers (<https://www.qld.gov.au/environment/pollution/funding/everyones>).

New South Wales new protection measures – National Targets 4, 5, 7 and 9

In 2017 the *NSW Biodiversity Conservation Act 2016* commenced. This Act aims to conserve biodiversity at bioregional and state scales, maintain the diversity and quality of ecosystems, enhance their capacity to adapt to change, support conservation and threat abatement action to slow the rate of biodiversity loss and conserve threatened species and ecological communities in nature. Conserving and restoring vegetation integrity and habitat suitability are key considerations under the Act (<https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity>).

New South Wales has developed the *NSW Marine Estate Management Strategy 2018–2028*, which provides for an overarching, strategic approach to the coordination and management of the marine estate. It sets the overarching framework and vision for the New South Wales Government to coordinate the management of the marine estate over the next decade in accordance with the objects of the *Marine Estate Management Act 2014*. The Strategy outlines how New South Wales aims to manage threats to the environmental assets, as well as to the social, cultural and economic benefits the community derives from the marine estate. It identifies evidence-based management priorities and sets policy directions to manage the estate as a single

continuous system. The Strategy integrates with other coastal and marine programs and reforms in New South Wales to achieve a more coordinated approach to management of the marine estate by all levels of government. An Implementation Plan provides more detail on management actions implementation, agency and stakeholder responsibilities, timeframes, and key performance indicators (<https://www.marine.nsw.gov.au/marine-estate-programs/marine-estate-management-strategy>).

Connecting endangered woodlands in the Australian Capital Territory (ACT)– National Target 1, 4, 5, 7

In the ACT the 30,500 hectare Greater Gorooyaroo area and nearby Mulligans Flat Sanctuary represent some of Australia’s largest, best-connected and floristically diverse Yellow Box-Blakely’s Red Gum Woodland, a critically endangered ecological community. The Greater Gorooyaroo project, supported by the Australian Government, is a partnership between Greening Australia, rural landowners, the ACT Government and the New South Wales Government, through the South East Local Land Services. The project seeks to secure the future of the Gorooyaroo landscape by engaging with local people to develop shared understanding of the area and its ecological needs, and to implement agreed priority actions.

The project focuses on restoring, connecting and creating a resilient landscape through rehabilitation and restoration activities, including 300 hectares of revegetation, better management of problem plant and animal species, including 7000 hectares of invasive species control, and the active involvement of Indigenous peoples and local communities in natural resource management. The project also complements world-leading research in the Mulligan’s Flat Woodlands Sanctuary to reintroduce locally extinct native species, such as the Eastern Bettong and Bush Stone-curlew to the ACT (initially within the predator-proof fence of the Sanctuary). The Mulligan’s Flat Woodlands Sanctuary is a collaboration between the ACT Government, Woodlands and Wetlands Trust, Australian National University and the Commonwealth Scientific Industrial and Research Organisation (CSIRO), and attracts funding from Australian Government environment programs and the Australian Research Council. https://www.environment.act.gov.au/_data/assets/pdf_file/0014/630302/Woodlands-for-wildlife-highlights-from-the-last-three-years_ACCESS.pdf

Western Australia’s Biodiversity Conservation Act (2016) – National Targets 1, 4 and 9

The *Biodiversity Conservation Act 2016* (BC Act) was passed in 2016 [and became fully operative on 1 January 2019]. It replaces the former *Wildlife Conservation Act 1950* and *Sandalwood Act 1929* and provides Western Australia with modern provisions and greater protection for biodiversity, particularly threatened species and threatened ecological communities. This Act contains provisions for the public to nominate species, communities and processes for listing as threatened species, threatened ecological communities and threatening processes, which are assessed using IUCN criteria. The Act also supports private conservation efforts through cooperative arrangements that recognise, promote and provide protection made under biodiversity conservation agreements and conservation covenants and provides for biodiversity management programs for sustainable harvesting, damage mitigation and other conservation management issues. The Act contains greatly increased deterrent penalties for people and corporations impacting on threatened species and communities and greatly increased deterrent penalties for unlawful activities involving sandalwood.

Western Australia – adaptive Western Shield initiative– National Targets 5, 7 and 8

Western Shield is one of the biggest wildlife conservation programs ever undertaken in Australia and is aimed at recovering and sustaining wild populations of Western Australian native fauna threatened by foxes and feral cats. Western Shield is working to protect Western Australia’s native wildlife through landscape scale management of foxes and feral cats over 3.7 million hectares of bushland. Baiting of introduced predators has seen increases in the population size and distribution of priority native species, including the Quokka, Western Brush Wallaby and Black-Flanked Rock-Wallaby.

Monitoring animal populations is undertaken at selected sites within baited (and unbaited) areas in various ways, including trapping (and releasing) the animals that need to be monitored, as well as with remote cameras. Western Shield’s monitoring shows that the baiting of foxes and feral cats is having a positive effect on the state’s native animals when comparing baited and unbaited sites. Ongoing monitoring and evaluation also means that Western Shield can be adaptively managed through testing and adoption of new methods and technologies where appropriate and reallocation of funds as new priorities emerge (<https://www.dpaw.wa.gov.au/management/pests-diseases/westernshield>).

Other sub-national local initiatives – National Targets 1, 2, 4, 5, 6 and 7

Local councils in Australia also undertake a broad range of programs and projects to conserve and enhance biodiversity, whilst also providing green amenity for the public in urban centres with contribution to some of the interim national targets at the local level.

Northern Territory urban biodiversity planning: The Darwin City Council has developed the *East Point Reserve Biodiversity Management Plan*. The East Point Reserve is a significant public open space in the Darwin urban area (approximately 5 kilometres from the city centre), managed by the City of Darwin. The reserve is subject to range of interacting management concerns, influenced by the values and uses of the area. The Plan, developed in 2018, will provide management actions to be implemented at the East Point Reserve between 2019 and 2024 to manage, protect, and enhance the biodiversity of the reserve. The plan includes separate focus for managing for native fauna (including reintroductions); revegetation; weed and pest animal management, and water. The Plan will balance these matters with planning issues, as well as access, and other needs of stakeholders (https://www.darwin.nt.gov.au/sites/default/files/publications/attachments/east_point_biodiversity_management_plan2019_2024.pdf).

New South Wales Councils conservation planning: A number of New South Wales local councils have developed comprehensive koala plans of management and biodiversity strategies, as well as roadside vegetation management plans and policies. Community Strategic Plans also increasingly refer to managing biodiversity, in recognition of the role biodiversity plays in maintaining healthy communities.

Urban Open Space in Victoria in the City of Darebin, located in the inner north of Melbourne, is developing the *Open Space Strategy* for public open spaces. With more than 179 species of significant plants and animals, the Strategy, which began development in 2018, will work to protect and enhance remnant local native vegetation. It includes 39 bushland sites, with represent 39 per cent of the total open space in the municipality (<https://www.yoursaydarebin.com.au/openspacestrategy>).

South Australia's backyard biodiversity: the Campbelltown City Council, located in north east Adelaide, has developed a *Backyard Biodiversity* booklet. The booklet is a guide to biodiversity in the local area and provides recommendations for planting in peoples' backyards. The Council has also published *Garden Weeds* and *Bushland Invaders*, to help people recognise weeds in gardens, particularly those that can escape into the bush (<https://www.campbelltown.sa.gov.au/page.aspx?u=1939>).

Western Australian local action: Local governments in Western Australia directly influence biodiversity conservation by managing local government natural areas to protect and restore biodiversity, restore ecological corridors and minimise the impacts of pest species. They also encourage biodiversity through the use of native plant species in streetscapes and public open spaces. Local councils promote waterway health in urban, rural and natural areas by protecting and restoring riparian vegetation, managing stormwater and grey water, reducing sediment and chemical loads in run-off, and protecting coastal vegetation. Wherever possible, local planning policies are used to minimise the ecological impacts of urban development.

Private sector and community biodiversity connections - Targets 1, 2 4, 5, 6 and 7

Not-for-profit organisations, business, landcare and Indigenous communities together with private landholders are also working together to actively manage, protect and help Australia's biodiversity. Many also contribute progress towards several national targets, including increasing engagement in biodiversity conservation activities (National Target 1); increasing employment and participation of Indigenous peoples in biodiversity conservation (National Target 2); increasing the area of native habitat being managed for biodiversity (National Target 4); the restoration of fragmented landscapes to improve ecological connectivity (National Target 5); reducing the impacts of invasive species on threatened species and ecological communities (National Target 7).

At the national level, the Australian Government has also invested in various private sector led initiatives aimed at extending ecosystem connectivity across a range of land tenures, expanding protection and sustainable management to benefit multiple ecosystems and natives species, including internationally recognised biodiversity hot spots – contributing to National Target 6 – establishing continental-scale linkages to improve ecological connectivity.

The following are a sample of the various initiatives led by this sector.

Landcare community: The success and longevity of community based landcare (including affiliated coastcare, bushcare and other care groups) across Australia over several decades has contributed significantly to raise awareness about the importance of biodiversity, restoring natural habitat and the benefits of sustainable land management practice. Since 2014, the National Landcare Network together with state and territory based landcare networks, Landcare Australia Limited (LAL) and the Australian Government have worked collaboratively to support the Landcare community with funding, education and training and building social capital (<http://nlm.org.au/>). The landcare movement has changed the mindset of landholders to be more environmentally conscious and engender a stewardship ethic that has not yet been valued quantitatively.

LAL, a not for profit organisation, has led many campaigns to raise awareness about landcare and to increase participation and attract philanthropic and corporate support. It is also a national delivery partner for large scale projects funded under the 20 Million Trees program. LAL also attracts private sector sponsors to support projects, including restoration of natural habitat, sustainable land management, enhancing biodiversity, building resilience in Australia's food and farming systems, and creating social cohesion and wellbeing in communities (<https://landcareaustralia.org.au/about/>).

The 10 Deserts Project is an Indigenous-led partnership across Australia's vast desert country. As a collaborative project, its partners include Desert Support Services, Alinytjara Wilurara Natural Resource Management Board (AWNRM), Central Land Council, Indigenous Desert Alliance (IDA), Kanyirninpa Jukurrpa (KJ), Kimberley Land Council (KLC), Nyangumarta Warrarn Aboriginal Corporation (NWAC), Arid Lands Environment Centre Inc. (ALEC), Pew Charitable Trusts and The Nature Conservancy (TNC). The program is enabled by the BHP Foundation as part of its global Environmental Resilience Program.

The 10 Deserts Project is building the environmental resilience of our deserts, improving Indigenous social and economic well-being, and developing a strong Indigenous voice for the desert by building the capacity of Indigenous peoples and organisations to look after country. Driven by the shared purpose of connecting and preserving country, the partnership has created the largest Indigenous-led conservation network on earth. The project is led by Desert Support Services and involves Indigenous organisations, supported by international and regional conservation partners.

The project area spans over 35 per cent of Australia (2.7 million square kilometres) across five state and territory jurisdictions. Despite being relatively intact, these unique desert ecosystems are under increasing threat due to destructive wildfire, invasive noxious weeds and feral animals. The impacts of these threats are further exacerbated by climate change. The 10 Deserts Project will enable traditional owners to address these threats through the work of Indigenous rangers and land managers (<https://tendeserts.org/>).

Managing Gayini Nimmie-Caira Country: Extending beyond the desert areas of Australia, the Nature Conservancy (TNC) is also supporting Indigenous management of 87,816 hectares in the lower Murray-Darling Basin, covering the property named Gayini Nimmie-Caira located in south west New South Wales. This consortium led by TNC together with the Traditional owners represented by the Nari Nari Tribal Council, the Murray Darling Wetlands Working Group and the Centre for Ecosystem Science at the University of NSW aims to conserve wildlife and protect the significant cultural wetlands that connect with the Yanga National Park protected area. This initiative contributes to National Targets 1, 2, 4, 5, and 7 delivering on-ground conservation activities to restore and protect aquatic and terrestrial ecosystems including fire programs, weed and feral animal control, looking after cultural wetlands, and protecting threatened species in conjunction with supporting sustainable agricultural practice.

[On 22 January 2019, TNC in a joint venture initiative with the Australian owned Tiverton Agriculture (with support from private investors and philanthropy) purchased two neighbouring cattle stations along with their water rights north of Gayini Nimmie-Caira. This purchase is recognised as one of the most significant private land purchases for conservation in Australia and extends and strengthens complementary management to protect and sustain almost the entire Great Cumbung Swamp, one of the largest and most important wetlands of the Murray-Darling Basin (<https://www.natureaustralia.org.au/>)].

Gondwana Link aims to protect and restore ecological values from south-western Australia east to the Nullarbor Plain – an internationally recognised biodiversity hotspot in Western Australia. By focussing and building on areas of relatively intact habitat, a broad spectrum of local, regional, national organisations, private landholders and Indigenous communities are working together to reconnect 1000 kilometres of habitat, remove threats to existing bushland areas and improve the quality of ecological management

(<http://www.gondwanalink.org/>). The initiative attracts investment from various sources, including national programs. Amongst other funding partners, over the period 2014 to 2018 the National Landcare Program, Biodiversity Fund and Green Army supported 15 projects associated with this initiative contributing to the restoration and revegetation of threatened species habitat.

The Great Eastern Ranges initiative is centred on two major landscape features, the Great Dividing Range and the Great Escarpment. These two iconic geographical features run parallel along the eastern edge of Australia, separating the coast from the dry interior. The term ‘Great Eastern Ranges’ encompass the corridor of mostly intact uplifted natural lands extending 3600 kilometres from the Grampians in Western Victoria, north through New South Wales, the Australian Capital Territory up to Cape York in Far North Queensland. Three of Australia’s national ‘biodiversity hotspots’ occur along this eastern corridor, with the south east forest component being an internationally recognised biodiversity hotspot (along with south western Australia). Collaborative effort and investment across all sectors contribute to enhancing connectivity along the full length of the corridor, engaging landholders, local community groups, businesses and public authorities to extend complementary management of this connected landscape (<https://www.ger.org.au/home>).

Australian Land Conservation Alliance (ALCA) brings together key participants in the private land conservation sector to form a national voice to promote and strengthen private land conservation in Australia. ALCA’s mission is to ensure that private land conservation communities make the greatest possible contribution to the achievement of local, national and international nature conservation goals. National partners include Bush Heritage Australia, Greening Australia, NRM Regions Australia and The Nature Conservancy Australia together with private land conservation organisations operating at the sub-national scale.

Private land conservation in Australia is a diverse, complex and evolving sector, encompassing a collection of activities that contribute to the conservation of ecological processes on private land, across freehold, leasehold and Indigenous tenures. ALCA formed in recognition of the range of approaches implemented across the country, including conservation covenants, stewardship agreements and programs, such as Land for Wildlife, a voluntary wildlife conservation initiative and Landcare. Private land conservation is critical in increasing the viability of the protected area estate, and ecosystem services. Whilst the scale, motivations and types of actions vary across the landscape, private land conservation is about conserving, restoring and protecting important natural areas on private lands to maintain ecological processes, support economic and social interests, and contribute to national targets for biodiversity conservation (<https://www.alca.org.au/>).

IV. DESCRIPTION OF THE NATIONAL CONTRIBUTION TO THE ACHIEVEMENT OF EACH GLOBAL AICHI BIODIVERSITY TARGET

Australia is making good progress towards implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets. While work is progressing across all targets, during this report period, the notable areas where Australia has made good progress contributing to global targets include:

- Aichi Target 2 on integrating biodiversity values into national accounting, recognising achievement for adopting a common national approach to environmental-economic accounting for Australia
- Aichi Target 9 on reducing impact of invasive species and setting national priority actions to control or eradicate those species having the greatest impact on native species, recognising new national measures adopted to halt the decline of threatened species and coordinate biosecurity
- Aichi Target 11 on protected areas, accelerating protection for marine and terrestrial ecosystems
- Aichi Target 17 on updating the national biodiversity strategy and action plan, recognising the participatory approach to review and revise Australia's national strategy
- Aichi Target 18 on integrating traditional knowledge, innovations and practice of Indigenous Australians relevant to the conservation and sustainable use of biodiversity, recognising the extent of integration by different sectors to support various approaches and activities, at all levels.

Building on the progress reported in Australia's Fifth National Report, below is a selection of activities contributing towards the Aichi Biodiversity Targets. This list is not exhaustive and is based on the input received from various sectors, noting some examples have been referenced in other sections of this report. More detailed case studies are also presented for each global target to further illustrate the combined efforts of initiatives contribute to achieving results towards each of the global targets.

A summary of Australia's contribution to the Sustainable Development Goals is also presented.

Aichi Biodiversity Target 1: Awareness of biodiversity increased

Describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Raising community awareness of biodiversity is integral to the majority of programs and initiatives being delivered across Australia. Many grant and other funding programs are tailored to engage active participation of individuals and community groups to achieve onground results. Due to the evolution of landcare and sustainable land management in Australia, these programs mostly attract people already engaged with these issues. While most programs set performance measures to increase engagement, more can be done to better communicate and attract participation of those not already engaged in biodiversity related activities.

The following sample of programs and case studies delivered over the period 2014 to 2018 demonstrate steady progress to extend the reach of engagement, utilising social media and internet to target communications to a broader cross section of the Australian public. For example attracting community members to engage in local wildlife surveys, offering environmental restoration traineeships for young Australians, promoting citizen science monitoring and social media outreach are all utilising new avenues to raise awareness of biodiversity across Australia.

The Threatened Species Commissioner, who was appointed by the Australian Government in 2014, has a key role to raise awareness and mobilise support for threatened species in the community. The Office of the Threatened Species Commissioner uses traditional and social media to reach a significant portion of Australians on a weekly basis. The Commissioner's social media presence is an innovative approach in the sector and represents an emerging opportunity for government information sharing and engagement. As at October 2018, the Commissioner had over 40,000 social media followers and continuing engagement with leading media outlets.

The National Landcare Program is the Australian Government's environment and sustainable agricultural investment program which delivered \$1 billion over four years from 2014–2015 to 2017–2018. The program funded the National Landcare Network, 20 Million Trees and regional programs through the 56 regional natural resource management organisations (<http://www.nrm.gov.au/national-landcare-programme/phase-one>). One of the four strategic objectives for delivery stated that 'communities are involved in caring for their environment,' this was progressed through:

- employment of Regional Landcare Facilitators and other regional natural resource management organisation staff to coordinate and support building capacity and delivering on-ground works
- small grants delivered directly to the landcare, farmer groups and Indigenous communities or through regional organisations to support projects to address local issues and test innovation practices with potential benefits for industry
- grantees participating in regional planning processes to determine investment priorities for the area, and take up employment or training opportunities.

As at December 2016, National Landcare Program projects had engaged more than three million volunteers and run more than 12,000 community events, with more than 9000 people completing training courses (Report on the Review of the National Landcare Program, 2017).

Commonwealth Environmental Water Holder (CEWH) office has six local engagement officers (LEOs) working alongside State and local land and water management officers, providing outreach to local communities throughout the Murray Darling Basin. Local information and experience is critical to being able to effectively manage and deliver Commonwealth environmental water. LEOs are located in the sub-national state jurisdictions of South Australia, Victoria and New South Wales. These officers have helped to establish partnerships between the CEWH and local organisations to identify sites (including on private land) to receive environmental flows as well as manage the delivery of the water and reporting on the outcomes. Partners include irrigation corporations, non-government organisations, private landholders and Indigenous representative organisations.

The Green Army Program (2014-18), as detailed in Section III engaged young Australians aged 17 to 24 years as participants, to complete on-ground projects, providing practical training and experience for these individuals and delivering environmental or heritage conservation benefits to their local community. Each round was designed to achieve specific priorities in support of environmental, heritage and conservation outcomes. Protecting and conserving threatened species or ecological communities, migratory species, and regionally significant species, as well as their habitat was included as priorities for investment. The Green Army Program:

- engaged 11,206 young Australians as participants involved in 1255 projects across the country
- additional participants included the members of the organisations hosting projects, including community organisations, Landcare groups, natural resource management organisations, environment groups, Indigenous organisations and local councils (<https://www.environment.gov.au/land/green-army>)
- achieved a retention rate for Indigenous participants of 71 per cent (based on 2015–2016 reporting, when data began to be collected)
- as at 30 June 2018, 1671 Indigenous participants had started a Green Army project
- delivered communication and engagement activities over the life of the Program, with an indicated significant increase in community awareness about the Program, mostly as a result of recruitment and call for project campaigns. Following a campaign which ran from August 2015 to May 2016, awareness increased to 53 per cent (Green Army Year 3 Evaluation Report, 2017). This level of awareness about the Program can extend to an increase in awareness about the intended program outcomes to conserve the environment.

Queensland's Community Sustainability Action grants began in 2016, providing \$18 million over six years to eligible community groups and individuals for innovative projects which seek to address climate change, conserve Queensland's natural and built environment, and protect unique wildlife, such as koalas. The program supports locally based, community-driven projects that encourage real change in Queensland communities. Up to \$4 million was allocated through targeted rounds in 2017–2018 to projects which support a range of

environmental and heritage protection activities (<https://www.qld.gov.au/environment/pollution/funding/community-sustainability>).

Victoria's Living with Wildlife Action Plan, released in 2018, sets a vision that Victorian communities value wildlife, and work together to achieve the sustainable management and conservation of wildlife. Supported by an Action Plan with short-term actions (to be completed within one year) medium-term actions (to be completed in two to three years), intended outcomes are:

- Victoria's native wildlife population are healthy and secure
- the management of wildlife is sustainable and underpinned by available scientific evidence and best practice
- the Victorian community understands their roles and responsibilities relating to wildlife and are actively engaged in wildlife protection and conservation
- the Victorian community is confident in the government's actions to protect, conserve and manage wildlife (<https://www.wildlife.vic.gov.au/our-wildlife/living-with-wildlife-action-plan>).

In New South Wales, the Bellinger Riverwatch Project commenced in May 2017. This citizen science project collects consistent water quality data from the Bellinger River. Data from these samples is used to monitor changes in water quality and life forms. The program has a focus on the health of the entire river system, which is home to various threatened species, such as the Southern Myotis Fishing Bat, Giant Barred Frog and the Bellinger River Snapping Turtle. The project is a collaboration between the New South Wales Saving Our Species program, OzGreen, New South Wales Waterwatch, the Bellinger Shire Council and Western Sydney University (<http://www.ozgreen.org/br>).

Landcare community: The success and longevity of community based landcare (including affiliated coastcare, bushcare and other care groups) across Australia over several decades has contributed significantly to raise awareness about the importance of biodiversity, restoring natural habitat and the benefits of sustainable land management practice. Since 2014, the National Landcare Network together with state and territory based landcare networks, Landcare Australia Limited (LAL) and the Australian Government have worked collaboratively to support the Landcare community with funding and capacity building opportunities. The practical experience offered by landcare activities engaging landholders in sustainable agriculture and environment restoration, education and training have contributed to building the social capital of local communities. Changes in landholder mindset supporting environmentally conscious decisions, engendering a stewardship ethic has also been reported (<http://nlm.org.au/>).

LAL, a not for profit organisation, has led many campaigns to raise awareness about landcare and to increase participation and attract philanthropic and corporate support. Funding from LAL's private sector sponsors support projects, including restoration of natural habitat, sustainable land management, enhancing biodiversity, building resilience in Australia's food and farming systems, and creating social cohesion and wellbeing in communities (<https://landcareaustralia.org.au/about/>).

Landcare has a voluntary network of 5567 volunteer groups across our country and a digital audience of 154,922. The landcare ethos is also adopted by many farmers and landholders across Australia who undertake on-ground related work but are not affiliated with any particular Landcare group.

Case Study – Bush Blitz

Bush Blitz is the largest nature discovery program in Australia. Established in 2010 through a unique partnership between the Australian Government Department of Agriculture, Water and the Environment, BHP and Earthwatch Australia.

In the first seven years, 35 discovery expeditions have been undertaken, with eighteen of those held in four year period 2014 to 2018. Bush Blitz has involved more than 200 scientists, 86 BHP employees and 32 teachers directly engaging with over 5000 students. Bush Blitz has also conducted expeditions on eight Indigenous owned or managed properties, and engaged over 150 traditional owners and 70 Indigenous rangers in the biodiversity surveys, discovery, conservation and management, alongside scientists, parks' staff and other land managers.

Bush Blitz expeditions are large logistical exercises, undertaken in remote parts of Australia, and 15 Indigenous businesses have been engaged to supply goods and services. Indigenous rangers are engaged when a Bush Blitz survey extends over native title land. Prior to each survey, the traditional owners are consulted to understand their priorities. During the survey, Indigenous rangers are invited to participate in survey activities, with a focus on capacity-building. Post-survey engagement may also occur to further build capacity of rangers. All data collected from the expedition is supplied to the Indigenous land owners to help shape their species management plans.

Since the program began, 33 Bush Blitz expeditions targeting under-surveyed areas across Australia have made a major contribution to the understanding and conservation of our biodiversity. These surveys have discovered more than 1600 new species; added over 2000 new records to species lists for conservation management; generated more than 500 records of species listed as threatened, vulnerable or endangered; along with over 1200 records of pest species and more than 32,000 individual occurrences of plants, animals and other organisms, which can be accessed by land managers, scientists and the general public using online tools such as the Atlas of Living Australia. These records are publically accessible for land managers, scientists and the general public. The program has also supported *ex-situ* conservation of threatened plant species through seed banking and propagation, and has informed multi-level policies and management plans such as the *Australia State of the Environment 2016*.

In March 2017, spider experts on a Bush Blitz in the Quinkan country, near Laura, Cape York Peninsula, discovered over 50 new species of spider with the help of traditional owners and Indigenous rangers. The story captured the world's interest with over 35 national and international media outlets publishing variations of the story, and the story was shared over 6000 times on various social media channels (Director of National Parks 2016–2017 Annual Report).

Overall, it is estimated that at least 38,000 Australians have benefited from the shared experience and positive learnings of Bush Blitz, raising the awareness of the significance of biodiversity to sustainable ecosystems. (<https://bushblitz.org.au>).

Case Study – ClimateWatch

ClimateWatch is an app-based initiative that allows all Australians the ability to observe and record seasonal changes in species. Data is validated and used by scientists and land managers to determine patterns and changes in life cycles, changes in species relationships, the relationship with climate change, and how this can have consequences on our biodiversity.

At present there are large gaps in the information available on the patterns of life-stages of plants and animals. Most reports of phenology changes in species have come from the northern hemisphere. Through continual and increased use, ClimateWatch has aims to fill the gap in southern hemisphere data; whilst simultaneously making people more aware of the impacts of climate change, the importance of biodiversity and how to contribute to fill knowledge gaps.

Understanding the timing of phenological processes helps to optimise the management and conservation of the natural systems humans depend upon. It better informs when to harvest crops, when to manage for invasive species and assess the vulnerability of species, to help prioritise where to target the limited conservation resources. In this way, ClimateWatch helps build important scientific and conservation outcomes.

ClimateWatch also has significant educational outcomes. Since 2014, ClimateWatch has been used as a powerful educational tool connecting biodiversity monitoring and citizen science with secondary schools, tertiary institutions and more recently, corporate businesses. A 2017 study led by University of Western Australia researchers indicates that use of ClimateWatch in first year biological coursework, results in increased student interest in scientific research and environmental engagement (<http://www.news.uwa.edu.au/2017110210101/research/citizen-science-research-boosts-student-interest-biology-courses>).

ClimateWatch is also integrated in secondary schools through its free lessons, all mapped to the Australian curriculum (<http://climatewatch.org.au/for-educators>, <http://www.rememberthewild.org.au/school-students-blaze-trail-in-bid-to-help-tackle-climate-change/>). Through these educational activities, over 10,000 tertiary students have used ClimateWatch for their undergraduate biological coursework and over 20 secondary schools actively use ClimateWatch in their syllabus.

Numerous biodiversity monitoring trials have been established across Australia that can be used by the general public, but also for *ClimateWatch: Scientist for a Day* corporate learning days. These corporate team-building events deliver ‘toolkits’ to participants to encourage sustainable actions relating to biodiversity and climate change. Over 75 corporate employees have engaged with ClimateWatch, learning about the relevance of biodiversity to healthy ecosystems, impacts of climate change on biodiversity, how to monitor local flora and fauna for change, and how to help conserve it in urban and natural landscapes.

ClimateWatch builds action through local partnerships and stewardship programs. For example, partnering with Parks Victoria, schools and community groups utilise ClimateWatch trials to monitor impacts of climate change on plant and animals species within national parks. This information informs parks management strategies for biodiversity. All data is collated and uploaded to the Atlas of Living Australia database, using the ClimateWatch app or website.

Data gathered assists in understanding and managing behavioural and geographical changes to Australia’s biodiversity. More than 110,000 observations made by citizen scientists are feeding answers to hundreds of questions into the ClimateWatch database at Earthwatch Australia, collecting biological information on scales and time-lines that would otherwise not be feasible through traditional scientific research method (<http://www.climatewatch.org.au/>).

Case study - Reducing Urban Glow in Bundaberg

All of the world’s sea turtle populations are considered rare or threatened. Six live in Australia, and three nest along the Bundaberg Region’s coast at Mon Repos, Burnett Heads and Bargara, in Queensland. The Bundaberg coastline hosts the largest concentration of nesting marine turtles on the east coast of Australia and is home to 50 per cent of endangered Loggerhead Turtle breeding activity in the South Pacific Ocean. Scientific evidence indicates that artificial light sources have a negative impact on adult turtle nesting site selection and hatchling ocean-finding behaviour, by preventing turtles from navigating to and from the ocean.

The Reducing Urban Glow in Bundaberg project is a collaboration between Bundaberg Regional Council, project partners, including the Queensland Department of Environment and Science, Central Queensland University, Ergon Energy, Burnett Mary Regional Group, Prince’s Trust Australia, Greenfleet, Bundaberg Tourism and the locally based Sea Turtle Alliance. The project uses smart technology to measure urban lighting levels, and makes that data available to the community to reduce the negative impact of lighting on both nesting and hatchling marine turtles. This project aims to empower the community to make informed decisions about their use of light and take positive action to reduce urban glow. A network of sensors that measure light pollution will be strategically placed along the region’s coastline and the eastern fringe of Bundaberg city. Data from these sensors will be displayed on a real-time heat map so that community members can see lighting ‘hot spots’ across the region, and, where needed, make changes to reduce lighting intensity. The data collected will also guide deployment of smart lighting technology in precincts of highest urban glow and provide a means to measure the subsequent impact of reduced glow on the survival rate of marine turtles (<https://www.bundaberg.qld.gov.au/knowyourglow>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

The National Landcare Program provided a total of approximately \$40 million from 2013 to 2018 through World Heritage Grants to sub-national governments to support management of the 13 Australian World Heritage properties listed for natural heritage values. All of the relevant sub-national governments also contribute to these projects.

In particular, funding supported a World Heritage Executive Officer and Advisory Committee for 11 World Heritage properties. This specifically enabled community and scientific engagement on matters relevant to the management of the property’s values, ensuring that those who have an interest in these properties can be informed of management decisions. These functions helped improve the information base available for the Australian Government and other stakeholders, by:

- providing advice, including on community perspectives, to national and sub-national governments on the identification, protection, conservation, presentation and management of the property

- helping the Australian Government make informed decisions about impacts on World Heritage properties when considering developments proposed under national environment law, the EPBC Act
- developing broader communication materials to promote and transmit to future generations the Outstanding Universal Value of the properties (Review of the National Landcare Program, 2017).

In some cases this involved engagement with Traditional owners, as for the Willandra Lakes Region World Heritage Area. Funding for other World properties, such as Lord Howe Island, enabled protection of the island's outstanding natural values, while allowing for tourism engagement and communications. Overall, the program raised awareness about the values and importance of managing these iconic places for a broad range of stakeholders, locally, nationally and internationally (<http://www.nrm.gov.au/national/continuing-investment/world-heritage-grants>).

Funding will continue into the future, with a total of just over \$47 million in National Partnerships Payments to be made to sub-national governments, to support Australia's obligations under the World Heritage Convention for the period 2018–2023.

Aichi Biodiversity Target 2: Biodiversity values integrated

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia continues to make good progress to ensure biodiversity values and considerations are integrated with the range of new and existing national and sub-national policies, strategies and program objectives. Examples include the integration of biodiversity within our Environmental Accounting Strategy, *Environmental Economic Accounting: A common national approach strategy and action plan*, national and sub-national state of the environment reporting, the Great Barrier Reef Outlook Report and the Victorian Government's Valuing Victoria's Parks project, to name a few and as described below.

The Environmental-Economic Accounting Strategy was endorsed on 27 April 2018 by the national and sub-national environment ministers, to deliver a common approach to environmental-economic accounting in Australia. Environmental-economic accounting assists with understanding the condition of the environment and its relationship with the economy. The Strategy will ensure that coherent, comprehensive and integrated accounts are built and support public and business decision making at all levels, from local to national, and across all sectors. The Strategy involves the adoption of the UN System of Environmental Economic Accounts in Australia, which guides the development of monetary estimates of biodiversity and ecosystem services where useful to particular policy decisions.

A nationally consistent approach to environmental-economic accounting will also help address current information gaps, and bring together environmental and economic information in a coherent way, allowing comparisons and aggregation across sub-national jurisdictions.

The information provided by these accounts supports evidence-based environmental policy making and investment decisions, better targeted natural resource management, nationally consistent reporting on our environment, as well as more sustainable practices across all sectors.

The anticipated four long-term outcomes from a common national approach to environmental-economic accounts will be that:

- public and private decision-making results in a balance between economic, social and environmental outcomes
- public policy and strategic planning take into account the benefits of a healthy environment
- the environmental, economic and social return on investments in the environment are demonstrated
- the condition of environmental assets and their contribution to prosperity and wellbeing is fully integrated with measures of social and economic activity.

Indigenous Protected Areas and the Indigenous Ranger programs integrate biodiversity conservation as a key consideration when targeting investment to support and provide employment streams for Indigenous communities. The program enables Indigenous peoples, including junior rangers, to work on country and on projects to protect cultural and biodiversity assets. The flow-on effect aids reconciliation and healing, and provides for future prospects, such as additional employment (Review of the National Landcare Program, 2017).

Healthy Parks and Healthy People initiative of the State of Victoria has adopted an integrated approach to park management that not only considers the central role that parks play in protecting biodiversity and cultural heritage values, but also recognises the benefits of protecting our environment to the physical, mental, social and economic health of Victorians. The Victorian Government has been actively promoting the human health and well-being benefits provided by the natural environment through this initiative (<http://parkweb.vic.gov.au/about-us/healthy-parks-healthy-people>), adopting four key principles:

- the well-being of society depends on healthy ecosystems
- parks nurture healthy ecosystems
- contact with nature is essential for emotional, physical and spiritual health and well-being
- parks are key to sustaining balanced economic growth along with vibrant healthy communities.

The intrinsic connection between healthy environments and healthy communities was further highlighted through the signing of *The Victorian Memorandum on Health and Nature* by the Victorian Ministers for Environment and Health with the release of Victoria's biodiversity plan, *Biodiversity 2037* (<https://www.environment.vic.gov.au/biodiversity/victorian-memorandum-for-health-and-nature>). *The Victorian Memorandum on Health and Nature* outlines the Victorian Government's commitment to supporting and enabling an integrated, whole of government approach that recognises the benefits of healthy parks and other natural assets for the health and well-being of all Victorians. A cross government working group has been established to build an ongoing work program that aligns programs for health, outdoor recreation and parks.

Parks Victoria is bringing the Victorian Memorandum on Health and Nature and *Healthy Parks Healthy People* to life through a wide range of health and nature-focussed programs and partnerships that are targeted at fostering broader environmental and social benefits. These include increasing opportunities to enjoy parks for people living with a disability, those of lower social advantage and those from culturally and linguistically diverse communities. Important priorities are: growing volunteer and education programs, and promoting parks as settings for improving physical, mental, cultural and social health, while helping conserve our parks. Recent initiatives include guided walking programs for heart health and 'welcome walks' to encourage inactive women to walk for improved health and social connection.

Parks Victoria is also partnering with Griffith University in Queensland and the Queensland Department of National Parks, Sport and Racing, to undertake a pilot study quantify the benefits of parks for mental health, including economic benefits.

30 Year Plan for Greater Adelaide 2017 is South Australia's expanded strategy building on the existing concept of 'environmental protection areas' to include 'complementary developed landscapes' in the Adelaide and Mount Lofty Ranges volume of the State Planning Strategy (known as the *30 Year Plan for Greater Adelaide*, 2017 update). This strategy is designed to recognise and manage impacts on those areas critical to biodiversity conservation that are primarily used for extensive agriculture. In these areas, biodiversity and existing production systems are mutually beneficial, which has not been recognised in other policy or legislation in Australia. In seeking to maintain this dual-benefit, the degree to which development planning decisions align with the strategy will be measured through periodic evaluation (<https://livingadelaide.sa.gov.au/implementation>).

Australian Business and Biodiversity Initiative (ABBI) is a voluntary Australian alliance of organisations and individuals from business, government and the community, committed to integrating biodiversity and sustainability into their policies and practices. Established in 2012 the ABBI's mission is two-fold:

- to raise awareness of biodiversity and ecosystem services loss and degradation as a critical risk

- to recognise the opportunity for Australian businesses to support the development of practical solutions that integrate consideration of biodiversity and ecosystem services into business decision-making and ultimately improve the health and resilience of the environment and the economy.

Through the ABBI's range of capacity building and information sharing activities, members have contributed to global finance sector collaborations to generate products, including the *Business Investment in Biodiversity Report*. This study addressed a knowledge gap regarding the motivations for business investment in biodiversity (<http://www.environment.gov.au/system/files/resources/d2b34795-f424-4b3c-8f30-a97fb5954cf7/files/evaluating-business-investment-biodiversity.pdf>).

Using social and economic opportunities for threatened species recovery is a priority theme under the National Environmental Science Program. A theme focus is on the benefits of quantifying threatened-species management in rural and regional economies. One project, 'The economics of threatened species management' has used economic theory in developing a decision framework for conservation. To be able to prioritise and maximise conservation advantages the project aims to identify the costs and benefits derived from threatened species. This will be achieved through the assessment of investment in conservation actions, consideration of 'willingness to pay', and estimation of costs to industry, agriculture or general economic productivity. <http://www.nespthreatenedspecies.edu.au/projects/the-economics-of-threatened-species-management>

Case Study – Reef Guardians

The Great Barrier Reef Marine Park Authority's Reef Guardian program recognises the good environmental work undertaken by communities and industries to protect the Great Barrier Reef. The program demonstrates a hands-on, community-based approach that makes a real difference to the health and resilience of the Reef. Reef Guardians help to improve the economic sustainability of industries operating in the Great Barrier Reef region and ensure the environmental sustainability of the Marine Park. The program integrates biodiversity into a range of different aspects of the community, including examples below.

- **Reef Guardian Councils** (local councils along the Great Barrier Reef coast) have an important role in planning for sustainable population growth, approving environmentally sound developments and preparing the community for climate change impacts. They play an important stewardship role in modelling and promoting sustainable and Reef friendly practices to their communities.
- **The Reef Guardian Schools program** creates awareness, understanding and appreciation for the Reef and its connected ecosystems among teachers, students and broader school communities. This fosters stewardship and promotes a community culture of custodianship for Reef protection.
- **The Reef Guardian Fishers program** recognises commercial fishers who are fishing sustainably and maintaining the health of the Great Barrier Reef while building the future of their fishery, their business and the Reef. Reef Guardian Fishers recognise the future of their fisheries relies on the health and resilience of the Reef. These fishers have been actively contributing as part of the Queensland Sustainable Fishing Strategy implementation.
- **The Reef Guardians Grants program** encourages Aboriginal and Torres Strait Islanders, schools, scientific institutions and the wider community to collaborate on locally relevant projects that will positively influence the values of the Great Barrier Reef.

Activities supported by the grants contribute to the investment in delivering on-ground stewardship actions that support the *Reef 2050 Long-Term Sustainability Plan* outcomes and targets. The grants also deliver on the Reef Blueprint focus of 'Empowering people to be part of the solution'.

Case Study – Valuing Victoria's Parks

In 2015 Parks Victoria and the Victorian Department of Environment, Land, Water and Planning collaborated on the Valuing Victoria's Parks project, which used the System of Environmental Economic Accounting (SEEA) framework to report on ecosystem assets within the parks network and the flow of ecosystem services from these assets. This supported an assessment of the benefits Victoria's park ecosystems provide to the community in monetary terms.

The study quantified a range of benefits provided by Victoria's parks network, finding that:

- tourists spend \$1.4 billion per year associated with parks visits, generating \$1 billion gross value added and 14,000 jobs to the Victorian economy
- health benefits for physically active visitors to parks are valued at around \$80-\$200 million per year from avoided disease, mortality and lost productivity
- pollination benefits to producers and consumers of relevant agricultural products are valued at \$123-\$167 million per year
- water supply and filtration benefits from over one million hectares of park catchments are valued at \$83 million per year
- flood protection benefits are valued at \$46 million per year from avoided infrastructure costs.

The Valuing Victoria's Parks study was a successful demonstration of the SEEA framework and the information it can provide, and has helped inform debate about the value of parks and natural assets. The study was well received by government agencies and external stakeholders (<https://parkweb.vic.gov.au/about-us/valuing-victorias-parks>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

Australia's national *Environmental Economic Accounting (EEA) Strategy* (2018) sets out a common national approach to EEA that will make these efforts consistent and integrated through the use of a single framework—the United Nations System of Environmental-Economic Accounting (SEEA)—going forward. Other jurisdictions, such as Victoria (see case study, above) and South Australia, have also developed approaches designed to align with SEEA (<https://www.environment.gov.au/system/files/resources/f36c2525-fb63-4148-8f3c-82411ab11034/files/environmental-economic-accounting-strategy.pdf>).

Parks Victoria is also leading a new Health and Well-being Specialist Group within the IUCN's World Commission on Protected Areas (WCPA), to further develop an international community of practice that will build and apply evidence and develop cross sector partnership that recognise parks as nature based solutions to global health issues (<https://www.iucn.org/commissions/world-commission-protected-areas/our-work/health-and-well-being>).

To continue to build evidence on the co-benefits of health and nature, Parks Victoria is a contributing partner to a current evidence review being undertaken under the #NatureForAll initiative, on the benefits of people's interaction with nature for nature conservation (<http://natureforall.global/>).

Aichi Biodiversity Target 3: Incentives reformed

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia continues to provide positive incentives for the conservation and sustainable use of biodiversity, as well as other measures to offset residual impacts when unavoidable (refer to case studies below, including on South Australia's Native Vegetation Incentives Program, the New South Wales Conservation Partners Program and Biodiversity Offset Scheme under the New South Wales Biodiversity Conservation Trust).

The Australian Government released the *Environmental Offsets Policy* in 2012, which outlines an approach to use environmental offsets in EPBC Act decisions. This increases flexibility for business and other stakeholders, whilst maintaining desired environmental outcomes.

Environmental Stewardship Program, a continuing commitment under the National Landcare Program, provides long-term support for private landholders to maintain and improve the condition of nationally listed threatened ecological communities under the EPBC Act. There have been seven market-based, competitive funding rounds of the Environmental Stewardship Program in New South Wales, Queensland and South Australia. These have targeted the following ecological communities:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Weeping Myall Woodlands
- Natural Grasslands on Basalt and Fine-textured Alluvial Plains of Northern New South Wales and Southern Queensland
- Peppermint Box Grassy Woodland of South Australia
- Iron-grass Natural Temperate Grassland of South Australia.

This program was established in 2007, with participating land managers are contracted for up to 15 years (to June 2025) with annual incentive payment to conduct management activities to protect and enhance the condition of the threatened ecological community(s) on their land. Activities may include grazing management, weed and pest animal control, and maintenance of buffer zones (<http://www.nrm.gov.au/national/continuing-investment/environmental-stewardship>).

Revolving (land) Funds have been active in Australia for over 20 years, operating in a defined market niche protecting private land for conservation purposes. Revolving funds utilise an available pool of funds to purchase land with natural or cultural value, protect the values (via a conservation covenant) and sell the land on the open real estate market to buyers who are willing to manage the land for conservation in perpetuity. Sale proceeds are returned to the fund for holding ready for future land purchases.

Between 2000 and 2007, the Australian Government directed investment of over \$10 million to six revolving funds that had also raised capital from respective state governments and philanthropic donations. Currently five of these funds continue to operate at the sub-national level managed by conservation organisations and trusts (including the two detailed below). Each of the funds have leveraged the market to sustain a continuous conservation investment cycle, delivering conservation outcomes on private land to complement Australia's National Reserve System.

The Tasmanian Land Conservancy (TLC) is a not-for-profit, science and community-based organisation that raises funds from the public, to protect irreplaceable sites and rare ecosystems by buying and managing private land in Tasmania. The TLC network of reserves protect some of the most important natural areas in Tasmania, from remote mountain tops to coastal environments, woodlands, wetlands and grasslands. TLC conserves critical habitat for rare and threatened species, and areas that serve as safe havens for the future.

TLC works alongside committed landholders across Tasmania to identify, protect and manage important areas on their own properties, through the establishment of conservation agreements. Through the Revolving Fund, TLC purchases, protects (through the establishment of conservation covenants) and re-sells land to new owners keen to support conservation.

Trust for Nature is one of Australia's oldest conservation organisations, which protects and restores places in Victoria where wildlife and native plants can thrive. Over the last 45 years, Trust for Nature has secured 100,000 hectares of habitat on private land forever – places that are home to some of the rarest species, such as the Helmeted Honeyeater, Victoria's critically endangered bird emblem.

Trust for Nature was established in 1972 through the Victorian *Conservation Trust Act 1972*. This enabled people to contribute permanently to nature conservation by donating land or money to a not-for-profit organisation, with a specific focus on private land. In 1978, Trust for Nature developed 'on title agreements' known as conservation covenants as a way to protect native plants and wildlife. These legally binding agreements allow private landowners to conserve natural habitat on their properties in perpetuity. This is a unique power that Trust for Nature holds in Victoria. Since then, Trust for Nature have negotiated more than 1380 covenants and protected more than 62,000 hectares.

In addition, government funding and public donations have enabled Trust for Nature to purchase more than 40 properties, which have been converted to conservation reserves covering more than 35,000 hectares.

Trust for Nature offers a suite of services to landholders to assist in protecting and improving habitat. For example, mapping biodiversity features, developing a plan to improve habitat conditions for threatened species, helping to implement actions that manage threats to biodiversity, such as pest plants and animals, or increasing available habitat through revegetation works.

Where government funding is available for work on private property, Trust for Nature also regularly sets up collaborative projects with partner agencies, including the Victorian Department of Environment, Land, Water

and Planning, each of the ten Victorian Catchment Management Authorities, Parks Victoria and traditional owner groups (<https://www.trustfornature.org.au/about-us>).

The ***Australian Land Conservation Alliance*** 2018 report investigating opportunities to enhance conservation financing in Australia identified that more can be done to reform and further develop mechanisms supporting positive incentives to deliver conservation and sustainable use of biodiversity on private land (see section II, national target 3).

Case Study – South Australian Native Vegetation Incentives Program

The Native Vegetation Council (NVC) provides funding for a variety of research and conservation projects that promote the responsible and ongoing management of native vegetation in South Australia through the Native Vegetation Incentives Program, such as the NVC Significant Environmental Benefit Grants and NVC Heritage Agreement Scheme. The NVC must consider on-ground projects aimed at achieving or contributing to the enhancement, conservation, and management of native vegetation in South Australia. Grant proposals should aim to achieve the principles and objectives for establishing a Significant Environmental Benefit area outlined in the Policy for Significant Environmental Benefit.

The Significant Environmental Benefit (SEB) Grants began in 2009 and funds the on-ground restoration of native vegetation in South Australia. Money is paid into the Native Vegetation Fund by people who have cleared native vegetation and need to provide a SEB offset. This money is made available through SEB Grants to restore, revegetate or protect native vegetation.

Some grant funding rounds are for specific restoration activities or specific regions of the state. The Applicant Guidelines for each grant round will detail the focus area or activities for that round. There is an expectation that the investment will be effective over the long term and projects should demonstrate sustainability into the future. Projects may extend over several years but are subject to annual review.

The NVC Heritage Agreement Scheme, Heritage Agreements are helping to maintain important ecosystems in South Australia. A Heritage Agreement is a conservation area on private land. It is established by agreement (or contract) between a landholder and the South Australian Minister for Sustainability, Environment and Conservation.

Agreements are ongoing or perpetual and are binding on future landholders. This means that even if the property is sold or ownership is transferred in the future, the conservation status of the land under agreement will continue. Native plants and animals in the specified area must be protected from the time the agreement is made. Since the scheme was introduced in 1980, more than 2,800 landholders have agreed to ensure the long-term protection of over 1 million hectares of the state's native vegetation

(<https://www.environment.sa.gov.au/get-involved/grants-and-funding/native-vegetation-incentives-programs>).

Case Study – New South Wales Biodiversity Conservation Trust

The New South Wales Biodiversity Conservation Trust (BCT) is a not-for-profit statutory body established in August 2017 under the *Biodiversity Conservation Act 2016* to support and encourage landholders to protect and conserve biodiversity on private land.

The BCT's programs are a ground-breaking approach to meaningful conservation on private land in NSW and the NSW Government has now committed more than \$350 million over the next five years to the BCT to deliver its private land conservation programs.

The BCT's Conservation Management Program is aimed at encouraging private landholders to participate in private land conservation in priority investment areas or with conservation assets on their property. Priority investment areas and conservation assets are identified in the Biodiversity Conservation Investment Strategy (BCIS) developed by the New South Wales Minister for the Environment.

The BCT uses a range of mechanisms – conservation tenders, fixed price offers, revolving fund and co-investment partnerships – to encourage landholders to participate in the Conservation Management Program.

Since commencement (to end of 2019), 159 landholders have signed or plan to sign a conservation agreement with the BCT, creating conservation areas across 36,000 hectares and with more than \$100 million invested to support these agreements through annual conservation payments.

Other agreement holders are eligible to apply for Conservation Partners Grants. The new conservation agreements with landholders have protected examples of five NSW landscapes that were not previously represented within the protected area system and 64 NSW landscapes that are inadequately protected.

Under the Biodiversity Offset Scheme, the BCT also manages 193 Biodiversity Stewardship Agreements covering more than 22,000 hectares. The BCT is also securing offsets for developers who make payments into the Biodiversity Conservation Fund.

In total, the BCT is currently managing 1970 private land conservation agreements with landholders over more than 2.182 million hectares, which represents 2.7 per cent of NSW.

The BCT provides practical assistance to existing and new agreement landholders. This includes advice on conservation management issues, such as identification of species, technical guidance on management options, and monitoring the ecological outcomes achieved. BCT agreement holders have access to ongoing support from staff and ecologists; links to groups and organisations involved in conservation; and invitations to workshops and local field days (<https://www.bct.nsw.gov.au/>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

On 13 March 2015, the Australian Government introduced a measure to afford African lions of the highest level of protection under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The measure treats African lions as if they are listed on CITES Appendix I (threatened with extinction) and is designed to limit Australian trade in African lion items, including preventing imports and exports of African lion hunting trophies. It means that personally owned African lion hunting trophies may not be imported into Australia, unless the specimen was from an animal that was deceased prior to 1977. Further, commercial trade in African lion trophies as souvenirs is not possible, unless the souvenirs are from animals deceased prior to 1977.

The measure was introduced in response to concerns regarding animal welfare and the ethical treatment of African lions, including in 'canned hunting' situations.

Canned hunting is essentially an unfair hunt. It includes hunting of:

- lions in fenced enclosures where they can't escape
- lions that have been raised by people, so they approach hunters and their vehicles
- disoriented lions that have recently been put in a new environment
- drugged lions.

It is usually impossible to tell whether a particular African lion product has come from a lion that has been killed in a canned hunt or not. Australia's domestic measure is for all African lion items, which will reduce the risk of African lion trophies obtained through canned hunting being brought into the country.

African lions are listed internationally on Appendix II of CITES. Species on Appendix II are not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilisation incompatible with their survival. Trade in CITES-listed species is regulated through our national environmental law, the EPBC Act (<https://www.environment.gov.au/biodiversity/wildlife-trade/cites/stricter-measures/african-lion>).

Aichi Biodiversity Target 4: Sustainable production and consumption

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

The production of goods and services requires energy and materials—metals, minerals, water, food and fibre—all of which come from the environment. The impacts of resource extraction, production, transport, use and waste generation are central to how economic activity affects environmental condition and trends.

Understanding the relationships between economic activity, social wellbeing and environmental degradation is critical to creating a sustainable future. This includes understanding how ecosystem modification; resource extraction, production and consumption; and waste disposal affect the health and resilience of natural capital, and the ecosystem services provided (both market and non-market values).

It is not just domestic economic growth that can generate pressures on our environment. In an increasingly globalised economy, production of goods can be for both domestic consumption and export.

Australia produces more food, mineral and energy resources and products for export than for domestic use. Economic activity generates environmental pressures through production, distribution, transport (e.g. powerlines, transport and loading facilities) and waste generation, including greenhouse gas emissions.

Changes in the economic wellbeing of other countries can also affect the environment. Globally, economic output is projected to triple between 2010 and 2050. Rapid global economic growth has brought many positive results, but, at the same time, increased global demand for food, materials, energy and tourism can lead to increased pressures on the environment (<https://soe.environment.gov.au/theme/drivers/topic/economic-activity-driver-environmental-change>).

Improvements in the efficiency of resource use, an increase in the proportion of renewable energy generated from our abundant supply of solar energy, and declining costs of producing renewable have all contributed to easing some pressure on the environment. A shift in the Australian economy towards less energy-intensive sectors, such as the services sector (for example, health, education, finance, tourism), and changes in human behaviour in terms of energy use have also contributed. While environmental pressure resulting from energy consumption and greenhouse gas emissions have reduced, pressure from increases in waste production has increased (<https://soe.environment.gov.au/theme/overview/topic/drivers-environmental-change>).

Since 1992, Australia has steadily incorporated the principles of ecologically sustainable development into key environmental legislation, policies and programs. These include Regional Forest Agreements, the National Waste Policy, sustainable fisheries management and the National Water Initiative.

Regional Forest Agreements (RFAs) are long-term bilateral agreements for the sustainable management and conservation of our native forests. There are 10 RFAs with four state governments covering a number of native forestry regions— five in Victoria, three in New South Wales and one each in Western Australia and Tasmania.

The RFAs seek to balance economic, social and environmental demands on forests by setting obligations and commitments for forest management that aim to deliver:

- certainty of resource access and supply to industry, to build investment confidence
- ecologically sustainable forest management, to ensure forests are appropriately managed and regenerated
- an expanded and permanent forest conservation estate, to provide for the protection of our unique forest biodiversity.

The 10 RFAs cover 21.9 million hectares (16 per cent) of Australia's forests. The forests in RFA regions comprise 20.4 million hectares of native forest, 1.2 million hectares of commercial plantations and 0.3 million hectares of 'other forest'. Nationally, approximately five million hectares of native forest have been added to the conservation reserve system between the signing of the RFAs and 2016.

RFAs implement the Australian and state governments' commitment to ecologically sustainable forest management, as identified in the National Forest Policy Statement (1992). As signatories to the statement, the

Australian, state and territory governments are committed to the sustainable management of all Australian forests, whether the forest is on public or private land, or reserved or available for production.

The RFAs provide high-level guidance on management and use of forest resources in the RFA regions but they are not detailed forest management plans. For forests in RFA regions, state governments have day-to-day management responsibility, which is implemented through legislation, forest management plans and codes of practice that cover public production forests and reserves.

Five-yearly reviews on the implementation of each of the 10 RFAs over the last 20 years have reported on the effectiveness of these agreements in achieving a balance between environmental, social and economic outcomes for each region. The reviews considered the effectiveness of implementation and invited feedback from stakeholders. The findings were independently reviewed to identify any improvements.

The RFAs were signed progressively between 1997 and 2001 for a period of 20 years, and all have been or are being extended. The extension process has shown that RFAs are a strong and effective framework for the sustainable management of forests in RFA regions (<http://www.agriculture.gov.au/forestry/policies/rfa>).

New Waste framework and Action Plan - In 2018, Commonwealth, state and territory environment ministers, and the President of the Australian Local Government Association agreed to the *2018 National Waste Policy* (<https://www.environment.gov.au/protection/waste-resource-recovery/national-waste-policy>). The policy identifies five overarching principles underpinning waste management in a circular economy. These include:

- avoid waste
- improve resource recovery
- increase use of recycled material and build demand and markets for recycled products
- better manage material flows to benefit human health, the environment and the economy
- improve information to support innovation, guide investment and enable informed consumer decisions.

The National Waste Policy Action Plan [agreed in 2019] creates targets and actions to implement the *2018 National Waste Policy* (<https://www.environment.gov.au/protection/waste-resource-recovery/publications/national-waste-policy-action-plan>). These targets and actions will guide investment and national efforts to 2030 and beyond. These include:

- ban the export of waste plastic, paper, glass and tyres, commencing in the second half of 2020
- reduce total waste generated in Australia by 10 per cent per person by 2030
- 80 per cent average recovery rate from all waste streams by 2030
- significantly increase the use of recycled content by governments and industry
- phase out problematic and unnecessary plastics by 2025
- halve the amount of organic waste sent to landfill by 2030
- make comprehensive, economy-wide and timely data publicly available to support better consumer, investment and policy decisions.

The tourism industry is important for the Australian economy, comprising approximately three per cent of gross domestic product (GDP) in 2014–2015. It contributes more than \$47 billion and more than 550,000 jobs to the Australian economy (2014–2015), and growth in this sector is more than three times the growth of the total economy. Australia accommodates more than 6.9 million international and 87.1 million domestic overnight visitors each year, which account for 72 per cent and 28 per cent of tourism GDP, respectively. A large proportion of tourism is based on the coast, where most of our major cities and tourist hotspots are located. Tourism at the Great Barrier Reef, for example, attracts approximately \$5.2 billion per year.

Some tourism impacts, such as influxes of tourists arriving on cruise ships, are localised and sporadic, whereas others, such as camping and recreational fishing, are dispersed along the coast and occur seasonally or year round. High-quality quantitative data on recreational activities has generally not been collected, and disentangling cause and effect of impacts is complex because of many co-occurring pressures.

Pressures associated with tourism include human trampling, removal of flora and fauna, debris, damage or compaction by 4WD vehicles, development or pollution associated with transport, and infrastructure and development to support tourists. The magnitude of the pressures is often linked to access. Accessible areas can

have high visitor numbers but low per-person impact, whereas remote areas are generally visited by small numbers of 4WD users who impose different types of pressures. Retirees who travel independently for extended periods are an important component of tourism in remote areas, such as the Kimberley region in Western Australia.

Ecotourism is a significant and growing sector of the tourism industry, and provides a way to reconcile tourism and conservation. By marketing natural values, ecotourism can maintain the aesthetic appeal of coastal tourist areas while deriving economic value, and simultaneously produce environmental benefits. However, although ecotourism is often touted as a win-win model, tourism development and conservation can have conflicting interests, resulting in compromises that lead to some level of environmental impact.

Looking forward, pressures associated with tourism are expected to increase with population growth and coastal development, particularly near urban centres. Climate change is predicted to shift the distribution of tourism southwards, as the northern parts of Australia become increasingly unpleasant during warmer months (<https://soe.environment.gov.au/theme/coasts/topic/2016/population-growth-and-urban-development-tourism-and-recreation>).

Whale and Dolphins - Australia has developed the *Australian National Guidelines for Whale and Dolphin Watching 2017*, which describe how people can observe and interact with whales and dolphins in a way that ensures animals are not harmed or disturbed.

Whales and dolphins may be disturbed by the presence of people, whether they are on the land, in a boat or aircraft, as well as activities such as swimming and diving, feeding, touching, and making noise. The potential problems from disturbance may include disruption of behaviour, displacement from important habitat areas and reduced breeding success.

The Guidelines were developed in consultation with the state and territory governments, scientists, industry representatives and non-government organisations. They provide a consistent national policy for the management of whale and dolphin watching. They build upon and replace the *Australian National Guidelines for Whale and Dolphin Watching 2005*.

The guidelines provide advice for all governments in the development, updating and implementation of laws regulating whale and dolphin watching (<https://www.environment.gov.au/marine/publications/australian-national-guidelines-whale-and-dolphin-watching-2017>).

Case Study – Western Australia (WA) Sustainable Fisheries Management

The Western Australian Department of Primary Industries and Regional Development undertake annual ‘health checks’ on the status of all state fish resources. These assessments, along with trends in catch and fishing activity, are used to determine the status of key fisheries in terms of sustainability. Sustainability means ensuring the habitat and ecosystem supporting the fishery are in good condition. A sustainable fishery has sufficient spawning fish to produce the next generation, while allowing fishing to take place.

The latest annual status report on Western Australia’s fisheries and aquatic resources shows that the state’s fish stocks are well managed and healthy. For 2015–2016 some of the key indicators show:

- 95 per cent of fish stocks are not at risk from fishing
- more than 90 per cent of the Western Australian coastline is unaffected by fishing methods that interact with habitat, such as trawling.

Western Australia has achieved internationally-recognised sustainability benchmarks by being one of the first fishery management agencies in the world to introduce Ecosystem-Based Fisheries Management (EBFM) across all fish and aquatic resources.

EBFM is a holistic approach taking into account all ecological resources, from fish to dolphins and coral reefs, as well as economic and social factors, in deciding how to manage fisheries.

This type of approach recognises that fishing activity inevitably has an impact on ecosystems. However, providing these impacts are risk-assessed and managed, fishing can also result in significant economic and social benefits for the Western Australian community (<https://www.fish.wa.gov.au/Sustainability-and-Environment/Sustainable-Fisheries/Pages/Sustainable-Fisheries-Management.aspx>).

Case Study – Dugong and Turtle Protection Plan 2014–2017

Marine turtles and dugong that breed and forage in the tropical waters of northern Australia, the Torres Strait and around the world are listed protected species under the EPBC Act.

These iconic species have survived in tropical coastal habitat for many thousands of years and are an integral part of the traditional lives and culture of many Indigenous peoples. Marine turtles and dugong are also identified as values of the Great Barrier Reef Marine Park World Heritage Area, which provides them valuable habitat.

To enhance the protection of our iconic marine turtles and dugong in Far North Queensland and the Torres Strait, the Australian Government committed \$5.3 million over three years for delivery of a *Dugong and Turtle Protection Plan* under the Reef 2050 Plan and Reef Trust. The plan addresses threatening processes that impact on the long-term recovery and survival of these protected migratory species.

The *Dugong and Turtle Protection Plan* includes the following seven core elements.

- \$2 million for a Specialised Indigenous Ranger Programme for strengthened enforcement and compliance, and marine conservation in Queensland and the Torres Strait.
- \$2 million for an Australian Crime Commission investigation into the illegal poaching, transportation and trade of turtle and dugong meat in the Great Barrier Reef and Torres Strait.
- \$700,000 for marine debris clean-up initiatives.
- \$600,000 to support the Cairns and Fitzroy Island Turtle Rehabilitation Centre—the Reef Trust will support the work of the centre to rehabilitate sick and injured turtles and return them to the marine environment.
- Working with Indigenous leaders to provide for traditional use and reef protection—the Great Barrier Reef Marine Park Authority is working with traditional owners to develop Traditional Use of Marine Resources Agreements to provide for traditional use and deliver reef protection. This may also include voluntary no take agreements.
- Federal legislation tripling the penalties for poaching and illegal transportation of turtle and dugong meat—the *Environment Legislation Amendment Act 2015* amends various sections of the EPBC Act and the *Great Barrier Reef Marine Park Act 1975* (Marine Park Act) to provide additional protection for turtles and dugong. The amendments triple the maximum penalties for various criminal offences related to the killing, injuring, taking, trading, keeping or moving of turtles and dugong under the EPBC Act and for criminal offences and civil penalty provisions which apply to the taking of, or injury to, turtles and dugong where they are a protected species under the Marine Park Act. The tripling of maximum penalties does not impact on the rights of Native Title holders under the *Native Title Act 1993* to hunt turtle and dugong for personal, domestic or non-commercial communal needs.
- Extending a national approach to dugong and turtle management includes the development of EPBC Act policy documents and guidelines such as updating the *Recovery Plan for Marine Turtles of Australia 2003*, *Marine Turtle Referral Guidelines* and policy guidelines for dugong and seagrass habitats (<http://www.environment.gov.au/resource/national-dugong-and-turtle-protection-plan-2014-2017>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

Sustainable timber production and trade

In 2012, Australia implemented laws to combat illegal logging and promote the trade of legal timber products. These laws are set out in the *Illegal Logging Prohibition Act 2012* and the *Illegal Logging Prohibition Regulation 2012* (the Regulation). Under Australian law, illegal logging means ‘the harvesting of timber in contravention of the laws of the country where the timber is harvested’.

This includes a wide range of illegal activities, such as:

- logging of protected species
- logging in protected areas
- logging with fake or illegal permits
- using illegal harvest methods.

Australia is supporting efforts to combat the destructive trade of illegally logged timber, supporting better environmental outcomes domestically and abroad, while also supporting local investment, profitability and jobs. Illegal logging and corruption undermines community livelihoods and income streams of national governments.

Full compliance of the Regulation and its due diligence requirements commenced on 1 January 2018.

In 2012, Australia committed \$2 million to the International Tropical Timber Organization's (ITTO) thematic programme on Forest Law Enforcement, Governance and Trade. From 2014–2018, some of this funding was used to support the University of Adelaide in delivering a project on 'Implementing a DNA timber tracking system in Indonesia'. The project demonstrated the use of DNA timber tracking technologies in supporting the verification of timber legality and legal and sustainable supply chains, and how it could contribute to the enforcement of illegal logging laws such as Australia's.

In 2014, Australia committed a further \$6 million to combat illegal logging and contribute to efforts to reduce deforestation. The funding supported the third phase of the Responsible Asia Forestry and Trade (RAFT) program, a collaboration of seven conservation organisations working to build the capacity of countries, businesses and communities in the Asia-Pacific to practice legal and sustainable forest management and trade. RAFT is particularly focused on timber legality verification and the application of sustainable forest management practices, including those to reduce carbon emissions. They aim to reduce the rate of tropical deforestation and forest degradation in the region by 50 per cent by 2020 (<http://www.responsibleasia.org/>).

Coral Triangle Initiative

Recognising the need to safeguard the Asia-Pacific region's marine and coastal biological resources, the *Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security* (CTI) was formed in 2007. The CTI is a multilateral partnership between the Governments of Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands and Timor Leste. Through the CTI, the signatory countries have agreed to support people-centred biodiversity conservation, sustainable development, poverty reduction and equitable benefit sharing.

When the CTI was established, a group of stakeholders—including the Australian Government—were invited to become Partners to the CTI and to provide funding as well as technical and strategic support. Australia is well-positioned to provide technical and strategic expertise. The country's marine environment connects to the Coral Triangle, contributing the largest marine estate of any Coral Triangle nation, and world renowned expertise in marine planning and management.

The other seven Partners are: the Asian Development Bank, Conservation International, the Coral Triangle Center, the Global Environment Facility, The Nature Conservancy, the United States Government, and the World Wide Fund for Nature.

The Australian Government has committed to a phased multi-year program of support to the CTI, which has evolved and responded as the Initiative has grown. The first stage of support focused on building foundations and momentum for the CTI. The second stage of support focused on supporting the sea scapes goal of the Regional Plan of Action, assisting in the establishment of a Regional Secretariat, and building the capacity of individuals and communities to develop and grow sustainable industries and livelihoods. The third stage includes regional scale investment (such as in the sea scapes goal), as well as investment to support the national plans of action of Papua New Guinea, Timor Leste and the Solomon Islands. Projects are supporting:

- the development of nature based tourism across the Coral Triangle region
- collaboration for multi-use, integrated planning of large marine areas across the Coral Triangle region (under the sea scapes goal)
- tools and information to assist in marine planning and sustainable use of marine resources in Papua New Guinea
- coastal communities to become effective stewards of their marine environment (<https://www.environment.gov.au/marine/international-activities/coral-triangle-initiative>).

Aichi Biodiversity Target 5: Habitat loss halved or reduced

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Both national and sub-national governments continue to make progress to reduce the rate at which natural habitat is lost, targeting policy and investments to address habitat degradation and fragmentation. However, the *Australia State of the Environment 2016* indicated that based on available information, recognising that knowledge about vegetation condition is limited, most jurisdictions note that condition of habitat is mostly in decline with fewer larger patches of continuous vegetation (<https://soe.environment.gov.au/sites/default/files/soe2016-biodiversity-launch-version2-24feb17.pdf?v=1488792935>).

A sample of actions that are targeting action to contribute towards this target include renewal of Regional Forest Agreements, progress of the National Reserve System and Indigenous Protected Areas, and the 20 Million Trees Program.

Regional Forest Agreements (RFAs) are a key element in our approach to forest management laid out in the National Forest Policy Statement. Beginning in 1997, when the first agreement was entered into. RFAs are bilateral agreements for the sustainable management and conservation of our native forests, which aim to balance the full range of environmental, social, economic and heritage values that forests can provide for current and future generations. One of the key achievements of the RFAs was the establishment of a Comprehensive Adequate and Representative (CAR) reserve system, based on nationally agreed criteria, also known as the 'JANIS' criteria.

The CAR reserve system is based on three principles:

- including the full range of vegetation communities (comprehensive)
 - ensuring the level of reservation is large enough to maintain species diversity (adequate)
 - conserving the diversity within each vegetation community, including genetic diversity (representative)
- (<http://www.agriculture.gov.au/forestry/policies/rfa/about/protecting-environment>).

Further to information included under Aichi Target 4, when RFAs were signed between 1997 and 2001, around 3.3 million hectares of native forest previously available for timber production was transferred into conservation reserves, increasing the reserve system by 44 per cent. Approximately five million hectares of native forest have been added to the reserve system between the signing of the RFAs and 2016. The total area of forest covered by RFAs is 21.9 million hectares. Governments have committed to extend each of the 10 RFAs, continuing the national commitment to maintain the ecological sustainable management of Australia's forests.

The National Reserve System is Australia's network of protected areas, conserving examples of our natural landscapes, and native plants and animals, for future generations. Based on a scientific framework, it is the nation's natural safety net against environmental threats and challenges (*Australia State of the Environment 2016*).

As detailed in section II, the reserve system includes more than 12,000 protected areas covering more than 19 per cent of the country, which is over 151 million hectares. It is made up of Commonwealth, state and territory reserves, Indigenous lands and protected areas run by non-profit conservation organisations, through to ecosystems protected by farmers on their private working properties. Between 2014 and 2018, the terrestrial reserve system increased by more than 14 million hectares. (<https://www.environment.gov.au/land/nrs/science/capad>).

At the end of 2018, there were 75 Indigenous Protected Areas across more than 67 million hectares, covering over 44 per cent of terrestrial protected areas.

20 Million Trees is a national program, where the Australian Government is working with the community to plant 20 million trees by 2020 to establish green corridors and urban forests. The Program is intended to re-establish native vegetation, provide habitat to support our threatened species, sequester carbon from the atmosphere and improve the liveability of our cities and towns. The Program involves competitive grants,

delivered by individuals and organisations, and larger scale plantings, delivered by service providers (<http://www.nrm.gov.au/national/20-million-trees>).

As at 30 June 2018, \$64.47 million had been allocated to 233 projects to deliver 20 million trees. Approximately 95 per cent of all 20 Million Tree projects will support habitat of nationally listed threatened species or threatened ecological communities. The program has reported progress toward the target with over 12 million trees planted at the end of June 2018 (MERIT database).

National Landcare Program funding element included the 25th Anniversary Landcare Grants supporting community participation projects to conserve and protect local environments. This one-off grant round delivered 80 hectares of revegetation, with almost 5000 plants planted by end of June 2016 (Review of the National Landcare Program, 2017). Additionally, under the Regional funding stream of the National Landcare Program, over 10,650 hectares of revegetation activities were undertaken by regional natural resource management organisations nationally, with almost three million trees and understory plants planted and 6.2 tonnes of seed sown.

The Biodiversity Fund supported extensive restoration projects across Australia. More than 82,300 hectares underwent revegetation works, with over 12 million trees and understory species planted, and almost 250 tonnes of seed sown nationally. For example, in South Australia wetlands restoration projects focussed effort at Grass dale Lagoon (9000 plants in a 14.1 hectare fenced area); at Murray Lagoon (13,400 plants in a 22 hectare fenced area); and at Lashmar Lagoon (3600 plants in a 4.6 hectare fenced area). Seagrass restoration at Nepean Bay was also undertaken, with 7400 plants over approximately one hectare.

The Threatened Species Strategy has leveraged projects to improve the trajectory of threatened species and conserve their habitat. For example, in Far North Queensland, Ergon Energy has been working in partnership with the Wildlife Preservation Society of Queensland, to design and install glider poles to assist in the movement of fauna across fragmented habitat and roads. The poles are already seeing success with endangered Mahogany Gliders recorded utilising the crossing. The project has been made possible through public donations and support from the community, Girringun Rangers, HQ Plantations, City of Cairns Regional Council, Terrain NRM, the Queensland Government and Energy Queensland (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>).

EPBC Act identifies and protects matters of national environmental significance (MNES), including nationally threatened species and ecological communities. Listing threatened ecological communities is a form of landscape or systems-level protection. These communities provide vital wildlife corridors and habitat refuges for many plant and animal species, including threatened species, and other Australian plants and animals that are in decline. Protection through the EPBC Act complements other conservation measures, and is particularly vital for species and ecological communities that occur outside conservation reserves.

Listing of threatened ecological communities recognises that key natural assets are under tremendous pressure and a 'whole of system' or landscape approach to environmental protection is necessary. This means that extra protection is given to the threatened species which live within the community. In addition, protection is also granted to species that are not yet listed themselves as threatened (yet are often in decline). Protecting threatened ecological communities also aligns with other Australian Government initiatives, such as the *Threatened Species Strategy* (<https://www.environment.gov.au/biodiversity/threatened/communities>).

Mount Remarkable to the Sea project has focused on coastal protection and restoring riparian linkages in the Upper Spencer Gulf of South Australia. This has involved engagement with landholders across the four catchments; establishing strategic control of invasive weeds; enabling strategic revegetation and enhancing the resilience of the area. The on-ground outcomes of the project include 150 hectares of biodiverse plantings to buffer high value creek lines and reconnect Mount Remarkable National Park to the sea; 2000 hectares of vegetation protected and enhanced in high value coastal and riparian areas; and strategic, landscape-scale pest plant and animal control throughout the project area (<https://www.naturalresources.sa.gov.au/northernandyorke/projects/mount-remarkable-to-the-sea>).

Case Study – 20 Million Trees Dakalanta Seeding Project

Dakalanta Wildlife Sanctuary owned by the Australian Wildlife Conservancy covers 13,600 hectares and occupies a strategically important location on the Eyre Peninsula, South Australia. The Dakalanta Wildlife Sanctuary was revegetated to restore the severely degraded Drooping Sheoak Grassy Woodlands ecological community. This large scale revegetation project, funded by the 20 Million Trees program, was managed and delivered by Landcare Australia from 2015 to 2018. The project improved habitat and food resources for rare woodland birds and also the regionally threatened Southern Hairy-nosed Wombat.

Highlights:

- the project target of 595,000 trees and shrubs has been significantly exceeded
- over 2 million trees, shrubs and groundcovers have been established at the site
- over 2380 km (1190 ha) of direct seeding has been completed
- over 50 locally collected, Indigenous species were used in this project
- local Indigenous corporations were engaged to collect and process local seed
- community planting days were also held, with 3000 Sheoak tube stock planted.

Drooping Sheoak Grassy Woodlands have been declining in South Australia for several decades and are listed as rare in South Australia. This project is helping to reverse that trend, while also providing important habitat for a large, resident population of Southern Hairy-nosed Wombats. Local farmers, community groups, state government agencies and Aboriginal corporations have worked closely with Landcare Australia in order to deliver this large scale restoration project. The planning, logistics and materials required for delivering a project of this scale were extensive, with 1190 kilograms of seed collected and construction of a custom built direct seeding machine for the calcareous soils found on the project site. An integrated pest management strategy was deployed which adopted a regional approach to addressing the various invasive species that were deemed a threat to the project's success. The 20 Million Trees project on Dakalanta Wildlife Sanctuary has been extremely successful (Landcare Australia 2016-17 annual report).

Case Study – Great Kimberley Marine Park, Western Australia

In 2016, the Western Australian Government finalised the formation of Australia's second largest coastal marine park. As a key outcome of the \$103.6 million *Kimberley Science and Conservation Strategy*, the Great Kimberley Marine Park was formed, with the creation of the massive 1,845,000 hectare North Kimberley Marine Park. This means about three million hectares of ocean - more than half of Western Australia's Kimberley coastal waters - are now interconnected and protected in six new marine parks.

The new marine parks that make up Great Kimberley Marine Park include Lalang-garram / Camden Sound, Lalang-garram / Horizontal Falls, North Lalang-garram, and now, North Kimberley. Marine parks have also been created at Eighty Mile Beach and Roebuck Bay. Western Australia's marine parks and reserves have been increased by more than 200 per cent, from 1.5 million hectares to about five million hectares since 2008, delivering jobs, eco-tourism opportunities and unprecedented environmental protection. The area supports many threatened, protected and culturally important species, such as dugongs, turtles and sawfish.

The creation of Great Kimberley Marine Park recognises the need to protect intact sea scapes to the great extent possible, allowing species to move between key resource areas and mitigating the impacts of climate change.

The North Kimberley Marine Park protects coral reefs, mangrove-lined creeks and bays and sandy beaches that are home to a variety of marine species including dugongs, whales, dolphins, sawfish and turtles. The marine park is also rich in Aboriginal culture, and the Balangarra, Wunambal Gaambera, Ngarinyin and Miriuwung Gajerrong people have a cultural, spiritual and social connection to the north Kimberley sea country

Balangarra sea country in the North Kimberley Marine Park and Dambimangari country in the Lalang-garram marine parks will be jointly managed by traditional owners and the Department of Parks and Wildlife guided by a 10-year management plan.

The Kimberley Science and Conservation Strategy is delivering protection for the Kimberley's unique natural assets (<https://www.mediastatements.wa.gov.au/Pages/Barnett/2016/12/Creation-of-North-Kimberley-Marine-Park.aspx>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

The Australian Government took a leading role in the establishment of the Asia-Pacific Rainforest Partnership by hosting the first Asia-Pacific Rainforest Summit in November 2014. The Asia-Pacific Rainforest Partnership promotes global action and provides a platform to progress activities that reduce emissions from deforestation and forest degradation in the Asia-Pacific region.

The partnership works with governments, the private sector, and civil society to support the implementation of the Paris Climate Change Agreement and the United Nations initiative to incentivise developing nations to reduce emissions from deforestation and forest degradation (REDD+) in the region. The partnership leverages existing commitments under the Paris Climate Change Agreement, alongside the Sustainable Development Goals, to deliver practical forest conservation.

In August 2016, Australia supported the Government of Brunei Darussalam to host the second Asia-Pacific Rainforest Summit, which saw government, private sector, civil society and academic representatives come together to discuss forest conservation, climate change, and the implementation of the Paris Agreement in the Asia-Pacific region.

In April 2018, the third Asia-Pacific Rainforest Summit was hosted by the Indonesian Government, in collaboration with the Australian Government. The Summit brought together more than 1,200 participants from over 30 countries to examine the theme "Protecting Forests and People - Supporting Economic Growth" (<https://www.environment.gov.au/climate-change/government/international/rainforest-recovery>).

Through the Global Forest Observations Initiative (GFOI), partner countries, including Australia, provide financial and technical support to build capacity, improve access to satellite data and build measurement, reporting and verification (MRV) systems in developing countries. These systems are the first step towards accessing incentives for preserving forests, such as through the United National program Reducing Emissions from Deforestation and forest Degradation (REDD+).

Australia is a lead partner of the GFOI with Norway, the United States, the Committee on Earth Observation Satellites (CEOS) and the Food and Agriculture Organization (FAO) of the United Nations. Australia is also leading the development of the GFOI Methods and Guidance Documentation (MGD). These resources provide practical advice to help developing country partners establish forest monitoring systems that comply with international requirements.

The System for Land-based Emissions Estimation in Kenya (SLEEK) means that the Government of Kenya will be able to measure and report its land sector emissions and evaluate different land-use scenarios for sustainable development. This will help inform policy decisions to improve the management of forests, agriculture and water.

The Australian Government is working with the Government of Kenya to implement this \$12 million programme. It will develop an MRV system and a decision-support system. SLEEK data will be made freely available to all government agencies, non-government organisations and land holders.

Since 2009, Australia has supported Indonesia to develop a forest monitoring system which will allow Indonesia to develop policies to achieve their domestic and international forest commitments. From 2017–19, we are supporting Indonesia to further build and maintain capacity for MRV of the land sector, operationalise the MRV system within the Indonesian Government and share experiences with other developing countries (<https://www.environment.gov.au/climate-change/government/international/land-emissions>).

Aichi Biodiversity Target 6: Sustainable management of aquatic living resources

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia has a number of policies in place for sustainable fisheries management, both at the national and sub-national level, including the *Commonwealth Fisheries Bycatch Policy*, the *Commonwealth Fisheries Policy Statement* and the *Queensland Sustainable Fisheries Strategy*.

In November 2018, the revised *Commonwealth Fisheries Bycatch Policy* (the Bycatch Policy) was released. The Bycatch Policy provides a framework for managing fishing-related impacts to bycatch species in Commonwealth fisheries. It draws upon the outcomes of the [Report on the review of the Commonwealth Policy on Fisheries Bycatch of May 2013](#) and provides other relevant updates to ensure the Commonwealth's approach to bycatch management continues to reflect international best practice.

Key revisions include:

- improved guidance on species classification and policy coverage for all species
- inclusion of a risk-based approach to monitoring, assessing and managing bycatch
- consideration of cumulative impacts on bycatch species
- inclusion of a performance monitoring and reporting framework.

The Bycatch Policy is supported by implementation guidelines which provide detailed practical guidance on the assessment and management of bycatch species across the diverse range of Commonwealth fisheries.

The *Commonwealth Fisheries Policy Statement* sets out the Australian Government's objectives for the fisheries and aquaculture sectors. The statement outlines the government's approach to managing fisheries and the marine environment. The statement establishes a set of guiding principles which help inform the government's approach to fisheries management, policy and program design.

The statement highlights the shared nature of our marine resources, the government's efforts to maximise the benefits for all Australians, and the importance of the continued sustainability of the marine environment (<http://www.agriculture.gov.au/fisheries/domestic/fisheries-policy-statement>).

The *Commonwealth Fisheries Harvest Strategy Policy* (Harvest Strategy Policy) and associated implementation guidelines aim to ensure key commercial fish species are managed for long-term biological sustainability and to maximise the net economic returns to the Australian community. The policy also seeks to provide the fishing industry with a more certain operating environment.

The Harvest Strategy Policy provides a framework that allows a precautionary, evidence-based approach to setting total allowable catch levels in all Commonwealth fisheries on a fishery-by-fishery basis, to ensure that fisheries provide maximum economic returns while maintaining stocks at sustainable levels. The implementation guidelines provide practical advice on how to interpret and apply the Harvest Strategy Policy to our fisheries and contain details of the science behind the fisheries management decisions.

The Harvest Strategy Policy and its associated implementation guidelines were revised in 2018, following a review in 2017, to capture new developments in fisheries management and science. The policy revisions ensure that the policy settings continue to allow the Australian Government to pursue fisheries management objectives in a way that represents world's best practice. Changes in the revised policy include more direction on meeting environmental and economic objectives in multispecies fisheries and the application of the policy to internationally managed fisheries. Further, byproduct species are now covered within the scope of the policy (http://www.agriculture.gov.au/fisheries/domestic/harvest_strategy_policy).

The Fisheries Research and Development Corporation Indigenous Reference Group has developed research, development and extension principles aimed at developing self-management structures for cultural fisheries, and supporting sustainable development of traditional harvesting (<https://www.frdc.com.au/sitecore/content/frdc/partners/national-priorities-and-subprograms/Indigenous-reference-group>).

Under the EPBC Act, there are a number of provisions relating to the impact of commercial fisheries on biodiversity. Assessments and decisions are made about commercial fisheries in relation to impacts on matters of national environmental significance, impacts on species protected under the EPBC Act and export of products derived from fisheries. Assessments are based on the Australian Government Guidelines for the ecologically sustainable management of fisheries. These assessments cover both national and sub-national managed fisheries (<https://www.environment.gov.au/marine/publications/guidelines-ecologically-sustainable-management-fisheries>).

The Australian Government also develops threat abatement plans, such as the *Threat Abatement Plan for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations* (2018). Threat abatement plans provide for the research, management, and any other actions necessary to reduce the impact of a listed key threatening process on native species and ecological communities. Implementing the plan should assist the long-term survival in the wild of affected native species or ecological communities.

The Australian Government Minister the Environment, may decide whether to have a threat abatement plan for a threatening process in the list of key threatening processes established under our national environmental law, the EPBC Act.

This threat abatement plan is considered to be a feasible, effective and efficient approach to abating the threat to our biodiversity from the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations. The threat abatement plan binds the Australian Government and its agencies to respond to the impact of oceanic longline fishing on seabirds, and identifies the research, management and other actions needed to reduce the impacts of the key threatening process to an acceptable level (<http://www.antarctica.gov.au/environment/plants-and-animals/threat-abatement-plan-seabirds>).

Australia continues to implement the national plans of action for the conservation and management of sharks (NPOA–Sharks 2012, <https://www.agriculture.gov.au/fisheries/environment/sharks/sharkplan-2>) and for the minimising the incidental catch of seabirds in Australian capture fisheries (NPOA–Seabirds 2018, <https://www.agriculture.gov.au/fisheries/environment/bycatch/seabirds>). Both NPOA's fulfil Australia's commitment to each respective International Plan of Action developed by the United Nations Food and Agriculture Organisation (FAO). The NPOA's are voluntary instruments agreed by the Australian Government and sub-national level governments for implementation through existing legislative instruments and management measures.

At the sub-national level in the state of South Australia, Primary Industries and Regions South Australia's (PIRSA) Fisheries and Aquaculture division enables the sustainable development of South Australia's aquatic resources and the balanced growth of those fisheries and aquaculture industries. PIRSA manages South Australia's fish stocks in partnership with industry and the community. PIRSA Fisheries and Aquaculture develops and implements policy, and regulatory frameworks, to maximise social and economic benefits, and ensure the long-term sustainability of South Australia's aquatic resources (<https://www.pir.sa.gov.au/fishing>).

The status of the main species caught by commercial fisheries is regularly reported by the Australian Government and all sub-national governments, excluding the Australian Capital Territory. In addition, the Australian Bureau of Agricultural and Resource Economics and Sciences, in conjunction with the FRDC, produces annual reports on commercial fisheries and aquaculture statistics, and biennial reports on the status of key Australian fish stocks across state, territory and Australian Government jurisdictions. In Australia, the volume of wild-caught fish declined slightly in 2016–2017, while aquaculture increased by 4 per cent, or \$1.3 billion, which reflected a higher value for salmonids and edible oysters (<http://www.agriculture.gov.au/abares/research-topics/fisheries/fisheries-and-aquaculture-statistics>).

The *Australia State of the Environment 2016* indicated that, of a total of 238 identified stocks from 68 species, 170 stocks were assessed across state, territory and Australian Government jurisdictions, focusing predominantly on commercially fished species, but also including recreational catches, where appropriate. Of these stocks, 11 per cent are overfished, compared to 15 per cent stated in the 2011 report (<https://soe.environment.gov.au/theme/marine-environment/topic/2016/commercial-and-recreational-fishing>).

Across all regions of Australia, recreational fishing effort is often concentrated in predictable spatial areas, but can vary substantially on seasonal and inter-annual timescales. Most recreational fishing occurs in inshore waters. Although shore-based fishing is popular, more recreational fishers are using boats than in previous years. Boat size is increasing across most sub-national government areas and more advanced fishing

technology is being used, resulting in potential increases in effective effort (i.e. the effort associated with individual catches rather than the overall time spent fishing). This has the potential for recreational fishing to have larger impacts on populations of species overall. More remote areas are now being fished, as well as offshore fisheries for pelagic fish, including Southern Bluefin Tuna (*Thunnus maccoyii*) and deeper-water species, resulting in shifts in concentration of effort and catches onto particular areas and species. Social media is facilitating rapid transfer of information, which can also lead to concentration of effort in particular areas or on particular species. Overall, on a national basis, although the extent of information is highly variable, recreational fishing could be having a high impact on the marine environment, with little change in trend in the past five years.

Recent research indicates that local management, including the establishment of marine reserves can build resilience to external pressures. Studies of shallow-water marine reserves around Australia, for example, have shown an increased stability in fish populations compared with waters outside the reserve (<https://soe.environment.gov.au/theme/marine-environment/topic/2016/resilience-marine-systems>).

Case Study – Restoration of Windara Reef - Shellfish reefs

Shellfish reef ecosystems dominated by Australian Flat Oysters (*Ostrea angasi*) and Sydney Rock Oysters (*Saccostrea glomerata*) were once commonplace throughout southern and eastern Australia including in South Australian gulfs and bays prior to the 1800s. Researchers estimate that they once existed at over 200 locations in Australia, with reefs spread across 1500 kilometres of coastline in South Australia alone. Today, there are no known native oyster reefs left in South Australia and only a handful in left in Eastern Australia. Shellfish reefs are considered one of Australia's most threatened marine ecosystems with less than 10 per cent of historical extent remaining.

Windara Reef, located just off the coast of Ardrossan on the Yorke Peninsula in South Australia is the largest shellfish reef restoration project in Australia. The scale and nature of this natural infrastructure project has led to measurable social and economic benefits comparable to traditional infrastructure projects and a healthier marine environment and improved recreational fishing opportunities. The reef was constructed from 10,000 tonnes of limestone, 30 square metres of recycled oyster shells and seven million live native oysters. Construction of Windara Reef began in 2017, with 150 limestone reefs laid across a twenty-hectare area.

After three years, the original oysters seeded onto the reef during construction will start producing spat (offspring), which will help to create a self-sustaining reef. Other important species like snapper, calamari, crabs and algae will also colonise the reef from nearby areas contributing to the reef's ecological function and diversity. After seven years, the reef will mirror natural shellfish reef ecosystems and is likely to have as much as five times the biomass and species diversity compared to surrounding areas. Once fully established, Windara Reef will also boost fish productivity and improve water quality. The project will also result in economic and social benefit to the nearby communities of Yorke Peninsula, through the creation of new jobs, particularly tourism associated with recreation and fishing, as well as new volunteering and community education programs.

This project is a partnership funded by The Nature Conservancy, the Australian Government, the South Australian Government, the Yorke Peninsula Council, The University of Adelaide and the Ian Potter Foundation (https://www.pir.sa.gov.au/fishing/recreational_fishing/windara_reef). The Nature Conservancy has recently committed to leading the recovery of shellfish reefs across Australia through the establishment of 60 reef restoration projects over the next six years. If realised, the recovery of shellfish reefs in Australia would be one of the first global demonstrations of *national* recovery of critically threatened marine ecosystems and species.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

Australia is party to a range of conventions that establish global, regional and sub-regional management organisations that manage highly migratory, straddling, pelagic and demersal fish stocks. These instruments include the Convention on the Conservation of Southern Bluefin Tuna, which establishes the Commission for the Conservation of Southern Bluefin Tuna, the Agreement for the Establishment of the Indian Ocean Tuna Commission, which establishes the Indian Ocean Tuna Commission, and the Convention for the Conservation

of Antarctic Marine Living Resources, which establishes the Commission for the Conservation of Antarctic Marine Living Resources and signatory to the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific. Australia plays an active role in these organisations.

Many of these organisations are now focusing on the problem of Illegal, Unreported and Unregulated (IUU) fishing as a major threat to the effective management and conservation of regional fish stocks and are consequently seeking to identify vessels engaged in IUU fishing within respective areas of competence in order to effectively combat and eliminate these operations (<http://www.agriculture.gov.au/fisheries/iuu/illegal-fishing>). IUU fishing is estimated to account for approximately 15 per cent of the world's total annual capture fisheries output.

Following years of multinational investigations and pursuits of illegal Patagonian and Antarctic toothfish operators, in 2018 several IUU fishing operators were apprehended and punished, in part due to Australian authorities.

The Spanish Ministry for Agriculture and Fisheries, Food and the Environment announced sanctions of AU\$13 million against three companies involved in IUU fishing undertaken by the vessels Thunder and Tchaw. The Australian Fisheries Management Authority (AFMA) contributed to the effort to track Thunder, which had been reported for IUU activities in the Southern Ocean since 2005.

AFMA also played a key role in the international investigation of the illegal fishing vessel STS-50, jointly issuing the INTERPOL notice with New Zealand in 2016 and providing vessel position information to the Indonesian authorities in April 2018. The Indonesian Navy recently apprehended the stateless IUU toothfish fishing vessel, the STS-50, which had evaded capture over the past two years (<https://www.afma.gov.au/australia-takes-fight-illegal-fishers>).

Australia also ratified the Agreement on Port State Measures (PSMA) on 20 July 2015. The PSMA is the first binding international agreement to target IUU fishing, and entered into force on 5 June 2016. The PSMA measures will make IUU fishing less profitable and less attractive by:

- making it harder for these fishers to operate
- stopping illegally sourced fish from entering the market.

AFMA, as the national fisheries regulator, implements the PSMA as part of our port state controls including:

- providing port access permits
- inspecting foreign fishing vessels entering Australian ports.

Australia is one of 63 Parties to ratify the PSMA (<http://www.agriculture.gov.au/fisheries/iuu/port-state-measures>).

Aichi Biodiversity Target 7: Sustainable agriculture, aquaculture and forestry

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Forestry

Australia's management and conservation of forests is underpinned by the National Forest Policy Statement 1992 (NFPS), which was jointly developed by the Commonwealth, state and territory governments, and was written mindful that it immediately preceded adoption of the CBD and reflects key elements of the Convention relating to forest management. The role of the Australian Government in management and conservation of forests through the NFPS is to coordinate a national approach to environmental and industry-development issues; sub-national governments have constitutional responsibility for forest land management. The NFPS sets out broad national goals to be pursued at Australia's regional levels, and uses a framework that integrates environmental, social and economic objectives to ensure that we obtain a balanced return from all forest uses (<http://www.agriculture.gov.au/forestry/policies/forest-policy-statement>).

Agriculture

The sophistication of agricultural land management in Australia continues to increase. This is seen in ongoing reductions in the intensity of agricultural chemical use in the cotton industry, due largely to the adoption of genetically modified cotton; more careful use of fertilisers in sensitive environments (e.g. catchments of the Great Barrier Reef); and more flexible approaches to grazing management to reduce erosion and increase productivity. The stewardship role of farmers and the part that they play in conserving their land are increasingly recognised.

Horticultural production supply, quality and profitability are threatened by introduced and native pests, diseases and weeds. Integrated pest and disease management uses a number of different integrated methods, rather than relying on a single approach. This is advantageous when managing native animals (e.g. parrots, fruit bats) as pests, and for insect pests and diseases.

Integrated pest management practices aim to integrate all available pest control techniques to produce healthy crops with the least possible disruption to the agro-ecosystem, rather than relying on routine applications of pesticides. First proposed in the 1970s, these practices are becoming more widely adopted in the agricultural sector.

Insect-resistant and herbicide-tolerant cotton, and herbicide-tolerant canola are the three types of genetically modified crops in Australia. Insecticide use has been reduced by 85 per cent through the use of insect-resistant genetically modified cotton. Reduced insecticide use against the Cotton Bollworm Caterpillar (*Helicoverpa armigera*) has allowed other pests to survive and emerge as important pests. Grain crops (canola and wheat) appear to be able to retain existing yields with reduced insecticide applications, although better forecasting of years with low pest pressure is required to provide growers with opportunities and confidence to reduce insecticide input.

Native vegetation remnants host a higher density of predatory insects and spiders than crops; crops usually host higher densities of pests (immature and mature) than native vegetation. Remnant vegetation also provides parasite habitat, which contributes to pest suppression in crops. These biocontrol services reach 125 metres and beyond from native vegetation into crops; however, the spatial pattern of colonisation can be patchy. Reliability of biocontrol increases as the availability of remnant vegetation increases. Management and improvement of remnant vegetation can increase the predator to prey (pest) ratio, which can improve pest control in grain and cotton crops. Retention and management of remnant native vegetation can also maintain populations of native bees (agricultural crop pollinators), which are more abundant and diverse in agricultural landscapes with more remnant native vegetation (especially riparian vegetation) than in those with less native vegetation (<https://soe.environment.gov.au/theme/land/topic/2016/land-use-and-management>).

Improvements in soil protection in South Australia have been largely driven by the increasing uptake of ‘no-till’ cropping methods, with stubble retention to minimise exposure of soils to the risk of erosion. According to telephone surveys of agricultural land managers, no-till methods were used on 16 per cent of cropped land in 1999, increasing to 83 per cent in 2016. Changes in livestock grazing management have also contributed to this trend. The proportion of agricultural graziers reporting they routinely move their livestock out of paddocks into confinement feeding areas in dry seasonal conditions, to keep enough groundcover for erosion protection, increased from 22 per cent in 2002 to 54 per cent in 2016.

Supporting activities in South Australia have included collaborative research, development and extension; farmer adoption of new management practices; innovative machinery development; low-interest loans for no-till farm machinery; and farmer capacity building to manage risks associated with variable seasonal conditions. A key role of government has been to provide evidence and information which reinforces and supports improvements in farm management practices adopted by land managers.

The success story of agricultural soil conservation in South Australia has resulted from collaborative efforts by innovative farmers, consultants, industry groups, regional natural resource management organisations and government over many years (https://data.environment.sa.gov.au/Content/Publications/Booklet_25_RC405_SoilErosion.pdf).

SANTFA (South Australia No Till Farmers Association) is a state-wide, farmer-driven organisation and since 1998, has lead the way in facilitating the adoption of ‘no-till’ and conservation agriculture principles, as well as undertaking trials and research spanning a range of agronomic issues. SANTFA’s core values include nurturing, protecting and improving soil and other natural resources; sharing information, experiences and

innovations; and being independent and farmer-driven. Resources are provided to support SANTFA to continue working with farmers to increase the adoption of innovative practices that complement no-till and conservation farming principles. Examples include:

- the “Radio SANTFA” web-based podcasting service, which promotes sustainable land management and soil health messages
- strategic support was also provided toward the development of SANTFA’s five year strategic plan (2013/14 to 2017/18).

One of the strategic objectives of the National Landcare Program has been to increase long-term returns for farmers and fishers through better management of the natural resource base. As at December 2016, the Program had engaged more than 30,000 farming entities, with more than 8000 of these adopting management practice change, and more than 9.5 million hectares of land managed to improve productivity with complementary environmental outcomes. A 2016 survey of the Program indicated that 86 per cent of respondents had increased adoption of sustainable farming and fishing management practices (Review of the National Landcare Program, 2017).

Aquaculture

Australia has established a reputation as a supplier of safe, high quality seafood which is produced using environmentally sustainable practices. Aquaculture producers target high value domestic and overseas markets. Aquaculture in Australia is managed under strict environmental guidelines. While the Australian Government has a number of important functions in relation to aquaculture, including national programs for research, management of biosecurity, aquatic animal health, food safety, environmental management, and market access and trade, most elements of the regulation of domestic aquaculture production rest with the sub-national governments.

For example, in South Australia, the Primary Industries and Regions SA’s Fisheries and Aquaculture division supports and helps grow the aquaculture industry in South Australia through the development of policy, legislation and regulation; leasing and licensing; aquatic animal health; and scientific research and innovation (<https://pir.sa.gov.au/aquaculture>).

Aquaculture operations, particularly those that operate in, or discharge into, public waters, are required to comply with stringent environmental controls monitored on an ongoing basis by state agencies. Strict food health standards also apply to both aquaculture and wild capture products.

These environmental and food safety standards ensure fish grown in our waters are safe to eat and that seafood production does not unduly affect aquatic environments (<http://www.agriculture.gov.au/fisheries/aquaculture/aquaculture-industry-in-australia>).

Case Study – Sustainable Agriculture Small Grants

The Sustainable Agriculture Small Grants are part of the Australian Government’s National Landcare Program and support the resilience, competitiveness and productivity of our agricultural and fishing industries (Review of the National Landcare Program, 2017).

Originally the total funds available to the Small Grants Round was \$2.2 million as stated in the program guidelines, with funding to be allocated and paid to successful grantees in the 2015–16 financial year. An additional \$1.606 million was allocated for projects during the assessment phase, as the program was significantly over subscribed.

The total \$3.8 million was granted to 103 projects in June 2015. Grantees included farming systems’ groups, community groups and individuals from across Australia.

The objectives of this Small Grants Round were:

- to increase the capacity and knowledge of famers and fishers to productively and sustainably manage Australia’s natural resources
- the adoption of appropriate management practices that will increase the production or improve product quality while maintaining or enhancing the natural resource base.

Some of the broad range of projects that received funding included:

- Greening Australia (Western Australia): Sharing Knowledge for Sustainable Agriculture: Biodiverse Native Plant Fodder Systems in the WA Wheatbelt - The project was funded to deliver a number of workshops and field days across the Western Australia Wheatbelt providing information about mixed native plant fodder systems, including design and integration into existing farm businesses, on-going management, implementation costs, benefits and estimated annual returns.
- RMCG (several family trusts) (Tasmania): Property Management Planning (PMP) for a Variable Climate - This project assisted beef producers to build flexibility and resilience into their business through improving their skills in farm planning for climate variability in the North-West region of Tasmania.
- Tully Cane Growers Limited (Queensland): Better Management of Nutrients on Tully Cane Fields - This project aimed to reduce nutrient run-off from cane farms in the Wet Tropics by working with local sugarcane growers.

Case study – Bucks for Bush

Bucks for Bush sub-program was a devolved grant incentive program delivered in the South East of South Australia, which finished in June 2018. Landholders were given funding and technical advice to help them plan and deliver revegetation projects, as well as fencing and weed control in bushland, wetland and watercourse habitats. Landholders contributed significant cash and in-kind contributions towards their projects. Over the five years of the Bucks for Bush program:

- 107 projects were funded and landholders supported
- 3115 hectares of native vegetation, wetlands and watercourses were protected and enhanced through fencing, weed control and/or revegetation
- 111 hectares were revegetated, providing important habitat for native species in a highly cleared landscape
- 52 kilometres of native biodiverse shelterbelts were planted, improving connectivity in a heavily cleared and highly fragmented landscape
- numerous field days, workshops and bus tours were delivered, and fact sheets developed to increase landholders' knowledge and capacity to deliver revegetation projects.

The project was highly effective, involving a large number of landholders in on-ground conservation work on their properties, many of whom hadn't previously participated in natural resource management projects. Further, many of the landholders have since applied the skills developed through participating in the project, to deliver further revegetation/conservation projects on their properties, and thus demonstrating the effectiveness of the program in upskilling local landholders and delivering lasting change. The project sites will require further long-term monitoring to determine the effectiveness in providing habitat for wildlife, but it is anticipated that these revegetation sites will significantly improve connectivity and biodiversity (http://www.naturalresources.sa.gov.au/files/sharedassets/south_east/corporate/180426-2016-17-achievement-report.pdf).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional)

As Australia's specialist international agricultural research for development agency, the Australian Centre for International Agricultural Research (ACIAR) brokers and funds research partnerships between Australian scientists and their counterparts in developing countries. Since 1982, ACIAR has supported research projects in four regions—eastern and southern Africa, East Asia, South and West Asia and the Pacific. These research projects focus on crops, agribusiness, horticulture, forestry, livestock, fisheries, water and climate, social sciences, and soil and land management, and deliver specific development outcomes.

ACIAR is focused on the crucial development objectives of:

- improving food security and reducing poverty
- managing natural resources more sustainably, and mitigating and adapting to climate change
- improving human health and nutrition.

In pursuing these objectives, the Centre also aims to empower women and girls, foster more inclusive agrifood and forestry market chains, and build scientific and policy capability within the regions.

For example, over the past eight years, ACIAR has invested significantly in the Sustainable Intensification of Maize–Legume Cropping Systems for Food Security program in eastern and southern Africa, managed by the International Maize and Wheat Improvement Center. This ambitious collaboration across eight countries is improving livelihoods of tens of thousands of farmers battling the stress and impact of poor seasons. Independent evaluation of the project found that more than 235,000 small farming households had adopted conservation agriculture techniques introduced by the project. Improved agriculture practices such as better weed control, increasing the range of maize and legume varieties available to farmers, rehabilitating soils, improving value chains and scaling out proven technologies, are all improving production and having a positive impact on food security, crop diversity and resilience.

To July 2018, ACIAR commissioned and managed more than 1500 research projects in 36 countries, partnering with 150 institutions along with more than 50 Australian research organisations (<https://www.aciar.gov.au/publication/Annual-Report-2017-18>).

Aichi Biodiversity Target 8: Pollution reduced

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Since the fifth report, Australia has continued to implement strategies to reduce pollution levels. These strategies include the National Water Quality Management Strategy (NWQMS), which is a national approach supported by all Australian governments to improve water quality and reduce pollution. The NWQMS includes a range of guiding documents to support the assessment and management of water quality to protect the environment and for purposes such as drinking, agriculture and recreation (<https://www.waterquality.gov.au/about>).

Another measure is the **National Pollutant Inventory (NPI)** which provides the community, industry and government with free information about substance emissions in Australia. The desired environmental outcomes of the NPI are to maintain and improve air and water quality; minimise environmental impacts associated with hazardous waste; and improve the sustainable use of resources. The NPI has emission estimates for 93 toxic substances, and the source and location of these emissions (<http://www.npi.gov.au/>).

In 2014, a **National Clean Air Agreement (NCAA)** was proposed, which, after a public consultation process, was agreed to by all Australian environment ministers on 15 December 2015. The NCAA provides a framework to identify and prioritise specific air quality issues, and to develop effective and efficient policy. It acknowledges the importance of combining several strategic approaches: standards; emissions reduction measures; partnerships and cooperation; and better knowledge, education and awareness.

Actions delivered under the 2015–2017 work plan for the NCAA included:

- strengthened ambient air quality reporting standards for particle (particulate matter or PM) pollution
- the introduction of product emissions standards for new outdoor power equipment and marine engines (such as garden equipment and outboard motors), which commenced on 11 January 2018.

On 27 April 2018, national and sub-national Environment Ministers agreed on the 2018–2020 work plan, following a review of the initial 2015–2017 work plan. The new work plan builds on progress achieved and updates timeframes and next steps for a number of existing priorities. Actions on the 2018–2020 work plan include:

- reviewing national ambient air quality standards for sulfur dioxide, nitrogen dioxide and ozone, fuel quality standards, and the NPI
- completing the adoption of new emission and efficiency standards for new wood heaters and a continued commitment to sharing best management practices across jurisdictions (<https://www.environment.gov.au/protection/air-quality/national-clean-air-agreement>).

Gaps in **Australia's environmental management of industrial chemicals** were identified in the Productivity Commission's 2008 Research Report into chemicals and plastics regulation. To address this gap and better protect the environment, all Australian governments (Commonwealth, states and territories) agreed in 2017 to a proposed approach to a National Standard for the environmental risk management of industrial chemicals.

In early January 2020, the Australian Government released a package of draft legislation to establish the National Standard. Under the proposed legislation, the national Environment Minister will be able to schedule industrial chemicals and their use, and to assign risk management measures, based on the level of concern they pose to the environment and human health. Scheduling decisions will be recorded on a public Register which will provide, for the first time, nationally consistent minimum standards for the use, storage and disposal of industrial chemicals to manage risks to the environment and health. Once a scheduling decision has been made, each jurisdiction, including the Commonwealth, will be responsible for adopting and implementing the risk management measures through their own regulatory mechanisms.

The package of draft legislation, with explanatory material, is available on the Department's website at [environment.gov.au/chemicals-management/national-standard/draft-legislation](https://www.environment.gov.au/chemicals-management/national-standard/draft-legislation).

Under the National Landcare Program, the Reef Program has supported more than 700 farmers to **improve fertiliser management and stabilise erosion** on more than 710,000 hectares of land by mid-December 2016. This has led to a significant reduction in the nutrients and sediments flowing into the Great Barrier Reef from these paddocks.

Harmful marine debris includes land-sourced garbage, fishing gear from recreational and commercial fishing abandoned or lost to the sea, and vessel-sourced, solid, non-biodegradable floating materials disposed of or lost at sea. Most of these items are made of synthetic plastics. Harmful marine debris is recognised as a ubiquitous, global problem. Many industry, government and non-government stakeholders are also working to address marine debris and related issues (e.g. through beach clean-up and management of litter and illegal dumping).

The **threat abatement plan for the impacts of marine debris** on the vertebrate wildlife of our coasts and oceans incorporates actions needed to abate the listed key threatening process, particularly actions to develop understanding about microplastic impacts and the potential role of new technologies in waste management. The actions are intended to be feasible, effective and efficient, as required by our national environmental law, the EPBC Act. The plan binds the Australian Government and its agencies to respond to the impact of marine debris on vertebrate marine life, and identifies the research, management and other actions needed to reduce the impacts of marine debris on affected species. The 2009 plan was updated in 2018 (<https://www.environment.gov.au/biodiversity/threatened/publications/tap/marine-debris-2018>).

Case Study – Great Barrier Reef Water Quality Improvement Plan

The *Reef 2050 Water Quality Improvement Plan 2017-2022* is a joint commitment of the Queensland and Australian Governments that coordinates projects and partnerships to improve land management in reef catchments, reduce non-point source pollution and minimise the risk to the reef from declining water quality. It guides how industry, government and the community will work together to improve the quality of water flowing into the Great Barrier Reef.

The plan is an update of the *Reef Water Quality Protection Plan 2013* and supports delivery of the *Reef 2050 Long-Term Sustainability Plan*. The plan has an expanded scope and addresses all land-based sources of water pollution including run-off from urban, industrial and public lands, while recognising the majority of pollution comes from agricultural activities. It includes social, cultural and economic values, collectively for the first time.

Water quality targets have been set for the catchments adjacent to the Great Barrier Reef, based on modelling and other scientific information. The targets define the reduction in nutrients and fine sediment required by 2025. This provides a new level of specificity from the Reef 2050 targets that commit to achieving reductions of up to 80 per cent in dissolved inorganic nitrogen and up to 50 per cent in sediment in priority areas (<https://www.reefplan.qld.gov.au/>).

Case Study – Port Phillip Bay Environmental Management Plan

The Victorian Government is committed to conserving and enhancing the health of the state's marine and coastal environments. The *Port Phillip Bay Environmental Management Plan 2017–2027* (the EMP) is an important step towards achieving this goal and ensuring that Port Phillip Bay remains healthy and resilient over the coming decade.

Litter has negative impacts on marine life and on community enjoyment, and evidence is growing on the ecological and health impacts of microplastic litter in particular. Litter in Port Phillip Bay comes from a range of sources, but most flows in from the surrounding drains and waterways. Without strong management actions, litter loads to the Bay are projected to increase significantly as the urban population of Melbourne and surrounding areas grows.

Actions to reduce litter loads to the Bay include:

- establishing a baseline estimate of the volume of litter entering the Bay and supporting clean up activities
- supporting capability and capacity building programs that target litter prevention, including reduction of microplastics
- identifying and prioritising litter sources and pathways, and taking actions to prevent litter entering the Bay.

Priority actions to deliver the EMP began in late 2017 and will be implemented over ten years, following an adaptive management approach. A range of partner organisations will be involved, such as local council, catchment management authorities, industry and community groups

(<https://www.coastsandmarine.vic.gov.au/coastal-programs/port-phillip-bay>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional)

The Secretariat of the Pacific Regional Environment Programme (SPREP) Regional Reception Facilities Plan (RRFP) aims to manage waste from ships throughout the region by identifying ports that have the capacity to accept waste materials from ship operations, such as sewage, oil waste, and garbage. The RRFP enables countries in the Pacific to meet their obligations under the International Convention for the Prevention of Pollution from Ships to provide adequate waste reception facilities for ships. Funded through the International Maritime Organization Integrated Technical Cooperation Programme, Australia, through the Australian Maritime Safety Authority, provided in-kind support from 2013 to 2015

(<https://www.environment.gov.au/marine/international-activities/sprep-projects>).

Other countries involved are Samoa, Papua New Guinea, French Polynesia, Fiji, New Caledonia, Cook Islands, Republic of the Marshall Islands, Tonga, Nauru, Kiribati, American Samoa, Tuvalu, Wallis and Futuna, Federated States of Micronesia, Solomon Islands, Guam, Palau and Vanuatu.

Aichi Biodiversity Target 9: Invasive alien species prevented and controlled

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia continues to implement measures to manage invasive species, with active collaboration to revise and update related policies including the *Australian Weeds Strategy 2017–2027* and the *Australian Pest Animal Strategy 2017–2027*. These strategies provide national frameworks for addressing weed and pest animal issues whilst maintaining the sustainability of our primary industries, and reducing the impact of weeds and pest animals on the environment.

The EPBC Act establishes a List of Specimens Taken to be Suitable for Live Import (the Live Import List) to regulate what live animal specimens can come into Australia. Species are assessed for their potential risk to

our environment if they were to establish in the wild. This helps mitigate the establishment of new species of feral animals and weeds.

Biosecurity risks are changing as import volumes increase, and pathways become faster and more complex. The objective of our biosecurity system is to manage biosecurity risk to a very low level to ensure the safe movement of people, animals, plants, food and cargo into Australia. Australia has adopted an integrated approach with complementary measures applied across the biosecurity continuum offshore, at the border and onshore.

Further to detail provided in section II, there are a number of plans, groups and processes that come together to stage an effective response, but importantly, there is just one nationally agreed system used to respond to all pest or disease outbreaks. This Biosecurity Incident Management System (BIMS) is used consistently across the country by the Australian, state and territory governments, Plant Health Australia, Animal Health Australia, and the Commonwealth Scientific and Industrial Research Organisation's Australian Animal Health Laboratory (<http://www.agriculture.gov.au/biosecurity/partnerships/nbc/nbepeg/bims>). BIMS provides a uniform approach to managing the response to biosecurity incidents and can be applied to all biosecurity sectors. Various national response plans i.e. AUSVETPLAN and PLANTPLAN complement BIMS, providing disease or plant pest specific response advice. The Australian Government Crisis Management Framework outlines the arrangements used by Australian governments working together to coordinate responses to incidents. This approach is a continuum of prevention, preparedness, response and recovery.

The Australian Government Department of Agriculture, Water and the Environment provided \$42 million over four years (2015–2016 to 2018–2019) to improve the way that established pest animals and weeds are managed, through the *Agricultural Competitiveness White Paper*. This funding is targeted to:

- develop and implement new and improved tools and technologies for controlling established pest and weed species
- deliver projects to build the management skills and capacity of landholders, the community and industry
- collect and disseminate information to build awareness among landholders and the community of the benefits of management and costs of inaction
- assist with national coordination and collaboration.

This initiative contributes towards the Australian Government's commitment to better manage impact of invasive species on our biodiversity and native ecosystems, aiming to deliver better tools and control methods for managing invasive animals and weeds (<https://agwhitepaper.agriculture.gov.au/white-paper/white-paper-at-a-glance>).

Through the White Paper, the Department of Agriculture was also allocated \$200 million for biosecurity surveillance and analysis to target critical biosecurity risks. This investment was to improve Australia's ability to detect and manage biosecurity risks early and, in turn, minimise damage to farmers, the environment and economy. Around 30 biosecurity surveillance and analysis projects were delivered through the White Paper.

The Australian Government also committed \$20 million over five years (2017–2018 to 2021–2022) to establish and manage the Centre for Invasive Species Solutions to facilitate collaboration between governments, industry and research organisations on research development and extension activities to improve invasive pest animal and weed management (<https://invasives.com.au/>).

In June 2018 the Australian Government announced \$313 million to strengthen the biosecurity system to further protect Australia's \$63 billion agricultural industries, trade, unique environment and way of life. This amounted to a \$293 million investment over six years from 2017–2018, plus an additional one-off amount of \$20 million directed to support Tasmanian fruit growers impacted by a fruit fly outbreak during 2017–2018.

Since 2001, the National Red Imported Fire Ant Eradication Program has utilised expertise shared by international specialises in this field to discover patterns of ant activity and develop new ways of eradicating this highly destructive invasive species, which is considered the single biggest environment pest in Australia. The current 10-year eradication plan commenced in 2017 and is funded by the Australian Government and all state and territory governments to the value of \$414.4 million (<https://www.daf.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/ants/fire-ants/eradication/10-year-plan>), with further details in case study below.

Australia's first Chief Environmental Biosecurity Officer (CEBO) was appointed in October 2018 as the primary representative and advisor to the Australian Government on environmental and biosecurity risks.

The CEBO's priorities include embedding environmental biosecurity considerations into new and existing policies and processes; building and maintaining relationships with the environmental sector; finalising the national priority list of exotic environmental pests and diseases (see below); be the national point of notification for environmental pest and disease detections under the National Environmental Biosecurity Response Agreement (NEBRA – see case study, below); and design and deliver expenditure of the annual \$825,000 project fund.

This work will ensure our environmental and community biosecurity risks are better identified and prioritised. It will also improve environmental biosecurity preparedness, surveillance and response capacity (<http://www.agriculture.gov.au/biosecurity/environmental/cebo>).

The National Landcare Program is reducing impacts of pests, with more than 2.2 million hectares of pest control undertaken by early December 2016. This included removing more than 13,500 goats, nearly 12,000 rabbits and more than 9500 pigs. The Program is also helping to reduce the threat of weeds to the environment and agriculture by delivering more than two million hectares of weed control as at early December 2016.

By October 2016, the 25th Anniversary Landcare Grants, a one-off grant round under the National Landcare Program, resulted in more than one million hectares of pest control to manage pigs, cats, foxes and other pest species, and more than 22,000 hectares of weed control, reducing the threats posed by a range of damaging weed species (Review of the National Landcare Program, 2017).

Since the release of the *Threatened Species Strategy* in 2015, more than 18 million hectares of feral cat control has been undertaken. For example, Dirk Hartog Island in Western Australia (620 km²) is now feral cat free; West Island, off the coast of the Northern Territory, is almost free of feral cats (c. 13,000 hectares); and feral goats and deer have been eradicated from Kangaroo Island, South Australia (4405 km²) (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>).

South Australia's Primary Industries and Regions Department (PIRSA) Biosecurity applies specialist technical, policy and scientific expertise to facilitate the coordinated control of declared plants and animals under the South Australian *Natural Resources Management Act 2004*. The program works closely with natural resource management boards, and other state and national stakeholders, to implement policies for the prevention, eradication, containment and/or impact reduction of weeds and vertebrate pests. The Aquatic Pests program aims to prevent new exotic species becoming established in SA. The program also aims to reduce the extent or spread of exotic and noxious freshwater and marine species (<https://www.pir.sa.gov.au/biosecurity>).

Victoria uses a risk management approach to reduce the impact of invasive species threats. The effectiveness of Victoria's contribution to the national biosecurity system is achieved through a mix of tools - legislation, economic incentives, quality assurance and education. This enables tools to be targeted in a deliberate way toward specific goals (<http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds>).

Case Study – Eradicating the Red Imported Fire Ant

The response to the incursion of National Red Imported Fire Ants in south east Queensland is the oldest and largest of the current pest and disease eradication responses in Australia. It has been ongoing since 2001 and has been funded by both national and sub-national governments under cost-sharing arrangements.

In 2017, all Australian governments committed future funding of \$411.4 million for an enhanced, comprehensive 10-year eradication plan to detect, contain and eradicate fire ants in South East Queensland, referred to as the National Red Imported Fire Ant Eradication Program (the program).

An independent Steering Committee for the program was established to provide clear strategic guidance and support and ensure program transparency and accountability. The committee monitors program performance against targets and milestones to ensure long-term eradication success.

The 10-year eradication strategy aims to progressively reduce the size of the infestation in a staged, ‘rolling’ treatment program starting from the western boundary of the affected area and moving to the east. Key themes and strategies include:

- risk-based eradication planning approach through scientific analysis and modelling of infestation spread
- coordinated and focused eradication and suppression activity in infested areas
- quality assurance to ensure full and consistent implementation of eradication activities
- staged clearing of suburbs to reduce the operational area throughout the life of the program and confirmation of area freedom from fire ant following completion of the plan
- collaboration with multiple industries and wider community.

Staged intensive treatment commenced in Area 1 of 4 priority areas in 2017–2018. Eradication of red imported fire ants from Area 1 is on track to be achieved in 2020. Planned surveillance, suppression treatment and responsive treatment will continue in the remaining three priority areas with intensive treatment to be undertaken progressively (<https://www.daf.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/ants/fire-ants/eradication/10-year-plan>).

Case Study – Fire and weeds in the Top End

Parts of northern Australia’s valuable landscape have been transformed by weeds and changed fire patterns. Coupled with land clearing for agricultural development, this has impacted significantly on ecological, social and cultural assets.

One example is the Northern Territory’s greater Darwin region and Daly River catchment, where areas of tropical savanna have been invaded by weeds that threaten native plants and animals and impede access to parts of the landscape. Some of the grassy weeds here such as gamba grass produce high fuel loads, ultimately leading to more intense fires.

Invasion by gamba grass and the resulting changes to fire regimes has the ability to significantly alter ecosystem processes and may eventually lead to ecosystem failure. Australia’s current understanding about the combined impacts of these threats and the action needed to improve ecosystem function is limited.

The Northern Australia Environmental Resources Hub of the National Environmental Science Program (NESP) is undertaking a project that will draw on existing information about the impacts of land clearing, gamba invasion and changes to fire patterns on the natural landscape. Researchers will collect additional data where necessary and use this information to model the likely scenarios of changes in ecosystem function over the next 30 years in the Darwin and Daly regions. This information is critical to land use planning and management to predict, and hopefully prevent ecosystem failure.

Project activities:

- Evaluate and adapt fire behaviour models, and spread simulators for use in gamba-invaded savanna
- Quantify the impact of gamba grass invasion on changes to soil erosion and altered inputs to streams
- Assess biodiversity assets (fauna) and restoration potential (native plant seedbanks) in areas of extremely degraded savanna.

Anticipated outputs:

- Guidelines for use of fire and weed spread modelling for catchment-wide management planning
- Recommendations on the use and application of remote sensing technologies for detecting and mapping gamba grass and similar weeds
- Peer-reviewed scientific publications.

The project is being led by Charles Darwin University in the Northern Territory and the University of Western Australia (<https://www.nespnorthern.edu.au/projects/nesp/fire-weeds-top-end/>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

In 2017, Australia commenced collaboration to develop a national priority list of exotic environmental pests and diseases by 2020. This list aims to identify and prioritise invasive alien species that are likely to harm our environment (including biodiversity) and social amenity. The interim list [drafted in 2018/released in mid-2019] includes terrestrial and freshwater vertebrates, terrestrial and aquatic invertebrates, marine pests, plants, plant pathogens and wildlife diseases and aquatic animal diseases. The list will facilitate activities that help improve identification and prevent the entry, establishment and spread of exotic pests, weeds and diseases that have the potential for nationally significant negative impacts on Australia's environment and/or social amenity. In addition, the list will identify data gaps and improve prioritisation of pests, weeds and diseases, and their pathways for further research and development.

In developing the list, the Australian Government has considered the lists and prioritisation methodologies applied in the USA, EU and New Zealand, with the latter being an active participant in the development of the list.

Completing a priority list for exotic environmental pests and diseases will go towards meeting this Aichi Biodiversity Targets to prevent and control invasive alien species.

Workshops were held in March and June 2018, to bring together key stakeholders from governments and scientific experts to inform development of the list. These experts are currently assessing species for the national priority list and will consult with the public once the assessment period is complete. Once developed, the list will be published on a publicly accessible website, to ensure that it is available for worldwide consideration. The prioritisation process and list will be reviewed and updated after three years (<https://www.agriculture.gov.au/biosecurity/environmental/priority-list>).

Aichi Biodiversity Target 10: Ecosystems vulnerable to climate change

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

In recent years climate change has emerged as a global challenge impacting many native ecosystems and species. It remains high on the list of key pressures impacting Australia's biodiversity, as confirmed in the consecutive 2011 and 2016 *Australia State of Environment* reports. Climate variability and climate change are also considered to have a high or very high impact, with a worsening trend for many ecosystems, including coastal, alpine, rainforests, fragmented terrestrial ecosystems and areas vulnerable to fire and invasive species, inland freshwater and marine environments across Australia.

Recent events such as the coral bleaching on the Great Barrier Reef and the bushfires during the 2019–2020 season highlight the vulnerability of Australia's biodiversity to climate change.

Australia will continue to build and apply the knowledge relating to how ecosystems and species respond to such events, aiming to ensure interventions become more effective in the future.

Terrestrial ecosystems

Explicit consideration of climate change adaptation and resilience, including in the management of species and ecosystems that are vulnerable to climate change remain central to various national and sub-national biodiversity related policies and frameworks, including *Australia's Biodiversity Conservation Strategy*, the *Strategy for Australia's National Reserve System*, management plans and corresponding climate change strategies in place for all Commonwealth terrestrial reserves and regional natural resource management planning frameworks.

The *Strategy for Australia's National Reserve System* includes targets to protect critical sites for climate change resilience. Identified critical areas include large and small refuges, critical habitats, landscape-scale corridors, places of species and ecosystem richness, sites of endemism, sites that support threatened species and/or ecological communities, and sites important for the stages in the lifecycle of migratory or nomadic

species. The intent of this target acknowledges the importance of the National Reserve System being integrated with other collaborative efforts and mechanisms to build ecosystem resilience across the landscape (<http://environment.gov.au/land/nrs/publications/strategy-national-reserve-system>). More details on these mechanisms are provided in sections I, II, III and IV.

In December 2015, the Australian Government released a *National Climate Resilience and Adaptation Strategy*. This strategy articulates how Australia is managing the risks of a variable and changing climate. It identifies a set of principles to guide effective adaptation practice and resilience building, and outlines the Government's vision for a climate-resilient future. It acknowledges the contribution and continuing progress in building the National Reserve System and significant investments made under national programs such as the National Landcare Program and Biodiversity Fund to protect and build the resilience of Australian ecosystems to climate change (<https://www.environment.gov.au/climate-change/adaptation/publications/national-climate-resilience-and-adaptation-strategy>).

CoastAdapt, released in May 2017, is an online tool to support local governments and businesses to identify, assess and respond to climate risks in the coastal zone. CoastAdapt was developed by the National Climate Change Adaptation Research Facility and funded by the Australian Government. As an information delivery and decision support framework, CoastAdapt supports local governments and businesses by:

- helping organisations find maps of their local area under future sea-level scenarios
- supporting decision-makers to make informed adaptation plans using a six-step process
- providing guidance on working with communities to decide what to protect and how and when to protect it
- including information on insurance and legal issues, engineering solutions and undertaking risk assessments (<https://www.coastadapt.com.au/>).

During 2014 to 2017, the National Climate Change Adaptation Research Facility also compiled relevant and accessible climate adaptation material synthesising research information for policy and decision making (<https://www.nccarf.edu.au/synthesis>).

The **Regional Natural Resource Management (NRM) Planning for Climate Change Fund**, an Australian Government program operating from 2012 to 2016, provided \$43.9 million to improve regional planning for climate change and help guide the location of carbon and biodiversity activities. The Fund was delivered through two streams: Stream 1 (\$28.9 million) to support regional NRM organisations to revise existing regional plans; and Stream 2 (\$15 million) to produce regional level climate change information and provide guidance on the integration of that information into regional NRM and land use planning. An evaluation of the Fund in 2016 found that natural resource management bodies were better able to plan for and adapt to climate change, with improved information available to assist with adaptation projects and climate projections into the future. The program will enable these regional organisations to better implement on-ground projects to boost the resilience of their area as the climate changes (Stream 2 of the Regional Natural Resource Management Planning for Climate Change Fund 2013–2016 Final Evaluation Report, 2016) (<https://www.environment.gov.au/climate-change/adaptation/planning-climate-change-nrm>).

To enhance Australia's **Ramsar wetland climate change adaptation planning**, national and sub-national governments are working to improve understanding of climate change risk across the Ramsar wetland estate. This work will improve the capacity for site managers to prioritise and plan appropriate climate change adaptation planning and actions. As a starting point the Australian Government commissioned CSIRO to undertake a project to help wetland managers identify and characterise risks to Australia's Ramsar wetlands from climate change. Members of the Wetlands and Aquatic Ecosystems Subcommittee, a national body comprising State and Territory government wetland agency representatives, are involved in the project which includes development of:

- guidance for wetland managers to undertake detailed site climate change risk analyses for their Ramsar sites
- case studies, covering a range of wetland types, to illustrate application of the guidance material
- an overarching methodology to assess the vulnerability of Australia's Ramsar wetlands.

In December 2018, a workshop was held to road test the draft guidance using case studies from two Ramsar wetlands, the Muir Byenup Wetland System in Western Australia and Bool and Hacks Lagoon in South

Australia (<https://www.environment.gov.au/water/wetlands/publications/wetlands-australia/national-wetlands-update-february-2019/assessing-climate-change-risks>).

Climate impacts in national parks managed by **Parks Australia**, including Kakadu National Park, will include changes in fire regimes, changes in abundance and distribution of both native and non-native species, changes to hydrology and sea level, and damage from extreme weather events. Parks Australia's response to climate change encompasses three objectives: to understand by increasing our knowledge of the impacts of climate change on the natural and cultural values of parks; to adapt by taking action to prepare and respond to a changing climate; and to mitigate by reducing greenhouse gas emissions from our operations and pursuing opportunities for carbon abatement. Other Parks Australia reserves include Booderee, Christmas Island, Uluru-Kata Tjuta, Pulu Keeling, Norfolk Island national parks and the Australian National Botanic Gardens (<http://www.environment.gov.au/topics/national-parks/parks-australia/climate-change>).

Marine ecosystems

Australia continues to implement and reassess the impacts of climate change and other pressures on marine habitats. The *Australia State of the Environment 2016* considered those habitats, communities and species groups for which time series data is available, many are in good condition or improving following historical impacts. Key indicators of marine health, such as primary productivity, trophic processes and algal blooms, are also mostly considered to be in good condition. Several habitats, communities and species groups are highly spatially and temporally variable, and determination of trends in these is difficult, particularly where time series are short (<https://soe.environment.gov.au/theme/overview/marine-environment/topic/overview-state-and-trends-marine-environment>).

As also detailed in section II, the Australian and Queensland Governments released the *Reef 2050 Long-Term Sustainability Plan* in 2015 as the overarching framework for managing the Great Barrier Reef. It focuses on actions to address key threats, and build the health and resilience of the Reef in the face of a changing climate.

Since the Plan was released, the Reef has been deeply impacted by severe climate-driven mass coral bleaching events in 2016 and 2017, as well as severe Tropical Cyclone Debbie in 2017. Together these events impacted an estimated 80 per cent of coral reef area of the Great Barrier Reef Marine Park. The mass coral bleaching was the most severe single adverse event to impact the Reef. Ongoing heat stress has increased the incidence of coral disease, while outbreaks of the coral eating crown-of-thorns starfish are occurring at several locations across the Reef and resulting in widespread coral mortality (<http://www.gbrmpa.gov.au/our-work/threats-to-the-reef>).

One project aiming to address some of the anthropogenic and climate change impacts in the Great Barrier Reef is the Raine Island Recovery Project. Raine Island is located on the northern tip of the Great Barrier Reef, approximately 620 kilometres north-west of Cairns, Queensland. The vegetated coral cay is just 21 hectares in size, but holds significant environmental and cultural values. The entire island is a protected national park (for scientific purposes) and is not accessible to the public. The Raine Island Recovery Project aims to protect and restore the island's critical habitat to ensure the future of key marine species, including green turtles and seabirds. Changes in the island's landscape have caused tidal inundation—killing newly laid eggs which cannot survive underwater—and causing as many as 2,000 adult turtles in a season to die from overturning and entrapment in rocky cliffs, and from heat exhaustion on the nesting beach. This, combined with general habitat loss, boat strikes, over harvesting and pollution, has placed the green turtle in serious danger.

The Raine Island Recovery Project is:

- restoring the island turtle nesting habitat through beach re-profiling
- installing cliff-top fencing to reduce mortality of nesting female turtles
- rescuing stranded and overturned nesting female turtles
- monitoring key island species—including turtles, seabirds and apex predators
- undertaking research that is focused on increasing the resilience and viability of key species such as turtles and seabirds
- building Indigenous ranger capacity.

The Raine Island Recovery Project is a five year, \$7.95 million collaboration between BHP, the Queensland Government, the Great Barrier Reef Marine Park Authority, Wuthathi and Kemer Kemer Meriam Nation

(Ugar, Mer, Erub) traditional owners and the Great Barrier Reef Foundation (<https://parks.des.qld.gov.au/raineisland/>).

There has been steady development in the National Representative System of Marine Protected Areas (NRSMPA) since 2011, especially in the Commonwealth marine area. On 1 July 2018, five new management plans for 44 Australian Marine Parks came into effect. Since then, all 58 Australian Marine Parks, covering around 2.8 million square kilometres, have been managed to protect biodiversity and other natural, cultural and heritage values of the parks, and allow sustainable use of marine resources where this is consistent with maintaining park values.

Case study - The Biodiversity Knowledge Projects: Improving national biodiversity data resources and analytical capability

The *Biodiversity Knowledge Projects* are a \$5 million co-investment between the Department of Agriculture, Water and the Environment and the Commonwealth Scientific and Industrial Research Organisation aimed at improving Australia's biodiversity knowledge, data and analytical capability. The following projects will help to improve capability to manage and monitor the health status of biodiversity in a changing climate.

The *Australian Ecosystem Models Framework* is providing a national set of ecosystem models which consider the natural and non-natural dynamics of ecosystems, and the disturbance drivers that transition ecosystems between unmodified and modified condition states. The models articulate thresholds for resilience, and ecosystem responses to disturbance drivers such as fire, flood and drought. The models are essential for forecasting the likely trajectory of ecosystem change in a changing climate (<https://research.csiro.au/biodiversity-knowledge/projects/models-framework/>).

The *Recent Climate Driven Ecological Change* project has collected and modelled observations of recent ecological change across the Australian continent over the past century. A [national survey](#) of both climate and land use impacts on biodiversity has been conducted, providing deep insight into the types and magnitude of changes being experienced across Australia's environment in recent decades (<https://research.csiro.au/biodiversity-knowledge/projects/recent-history-climate-driven-ecological-change-australia/>).

The *Ecological Engineering for Biodiversity Adaptation to Climate Change project* has provided an [international review](#) of ecological engineering techniques to inform conservation in a changing climate. The project has tested new techniques for climate-smart revegetation and provides guidance on research and monitoring design to enable [rapid learning in the context of climate change](#) (<https://research.csiro.au/biodiversity-knowledge/projects/ecological-engineering-biodiversity/>).

A *Habitat Condition Assessment System* is Australia's first nationally consistent assessment of habitat condition for biodiversity. The project employs remote sensing, modelling of environments and site condition assessment data to provide a comprehensive, repeatable assessment of biodiversity habitat condition (<https://research.csiro.au/biodiversity-knowledge/projects/hcas/>).

Case Study – Resilience for the Great Barrier Reef

The *Reef Blueprint for Resilience* is the primary output of the 2017 Reef Summit, attended by 70 regional, national and international delegates representing marine park managers, traditional owners, government agencies, research institutions, industry groups, Reef users and other stakeholders.

The Blueprint signals the actions to be taken by a range of partners to strengthen the Reef's resilience, its capacity to recover after disturbances and return to a healthy state, and the challenges it faces now and in the future. The Blueprint is designed around 10 key initiatives, focused on delivering maximum benefits for Reef resilience. These initiatives fall into four broad areas:

- building a resilience network
- on-ground actions
- empowering people
- fostering change.

Fostering partnerships for action and innovation underpins these key initiatives and actions include:

- leadership by the Great Barrier Reef Foundation to establish the Reef Islands Initiative which was launched in April 2018, established a network of climate change refuges for protecting critical habitats and species across five Great Barrier Reef islands
- partnerships with traditional owners to deliver benefits for Aboriginal and Torres Strait Islander communities and the Reef, including the Traditional Use of Marine Resources Agreements, which support traditional owners' involvement in compliance management, research, education and youth-focused activities
- the Not-for-profit group Tangaroa Blue which has continued its efforts to reduce marine debris with the launch of the Australian Marine Debris Initiative app in June 2018, providing a platform for citizen scientists and partners to contribute data from their clean-up activities to a central database
- the 2018 Reef Guardians stewardship grants program which has provided seed-funding to communities for bringing people together to participate in local Reef protection projects.

This Blueprint outlines additional actions and innovative approaches the Great Barrier Reef Marine Park Authority will pursue with its partners to better support and protect coral reefs in the face of a changing climate. By focusing our efforts, we will give the entire Great Barrier Reef ecosystem its best chance of coping with the challenges ahead (<http://www.gbrmpa.gov.au/our-work/reef-strategies/managing-for-a-resilient-reef>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

Australia is involved in the Seagrass Restoration Network (SRN) Australasia, which links scientists, industry practitioners, community and government policy makers to consider the development and implementation of conservation, recovery and restoration of seagrass meadows. Members include universities, research institutes, laboratories, councils, and government and non-government organisations from around the world. Seagrass meadows are important carbon stores, but also provide essential habitat for important fisheries.

Projects are underway in Australia and New Zealand to restore seagrass and provide fish habitat (<https://seagrassrestoration.net/#home-1-section>). Research includes examining restoration and transplantation of seagrass in the face of climate change and other impacts, such as sediment and chemical pollution, as well as investigations to boost the effectiveness of seagrass as blue carbon (<https://seagrassrestoration.net/publications-3>).

Aichi Biodiversity Target 11: Protected areas

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia's national reserve system is made up of Commonwealth, state and territory reserves, Indigenous Protected Areas, other conservation reserves managed by non-profit conservation organisations, and ecosystems protected by farmers on their own private properties. These make up more than 19 per cent of the terrestrial areas and inland waters that are conserved as examples of the natural landscape and habitat for native plants and animals. Australia's reserve system has grown by 48 million hectares since 2009. A decade of investment from the National Landcare Program and other predecessor programs including the Caring for our Country Program, helped accelerate the National Reserve System by more than 27 million hectares (Review of the National Landcare Program, 2017).

However, despite this growth, only minor progress has been made since 2011 in meeting representation targets for ecosystems and threatened species. In part, this is because most growth has been in desert bioregions, so that representation improvements have been highly localised. Nearly 30 per cent of terrestrial endangered communities have more than 50 per cent of their extent represented in the National Reserve System. However, 30 per cent of endangered communities and 50 per cent of critically endangered communities have less than five per cent of their extent represented.

Conservation covenants have grown rapidly on private lands in Australia, and contribute to the terrestrial component of the National Reserve System. These protected areas have restrictions on use attached to the title of freehold lands, and special conditions on leasehold lands, to enable their management as private protected areas (<https://soe.environment.gov.au/theme/overview/land/topic/overview-state-and-trends-land>).

In Australia, substantial emphasis is placed on the management of forest ecosystems for the conservation of biodiversity, including through the creation of reserves, development of management prescriptions, and identification and listing of threatened species.

A total of 46 million hectares (35 per cent) of our native forest is on land protected for biodiversity conservation, or where biodiversity conservation is a specified management intent. This area is the result of a range of formal and informal processes on both public and private land that are used to protect areas of forest for the conservation of biodiversity. Many areas of forest are protected by, and reported under, more than one process. Part of this area is contributed by our National Reserve System, which includes 34 million hectares of forest (26 per cent of our native forests) that have a primary management intent of nature conservation.

The Australian Government committed \$15 million under the Indigenous Protected Areas Program 2017-2021 to assist Indigenous groups to establish new Indigenous Protected Areas. At the end of 2018, there were 75 Indigenous Protected Areas (IPAs) across more than 67 million hectares, covering over 44 per cent of terrestrial protected areas and the initiation of consultations with Indigenous groups to progress dedication of 5 new IPAs (<https://www.pmc.gov.au/-affairs/environment/indigenous-protected-areas-ipas>).

Australia has exceeded Aichi Target 11 for marine areas with Australia's National Representative System of Marine Protected Areas covering around 3.3 million square kilometres or around 37 per cent of Australia's marine jurisdiction (<http://www.environment.gov.au/system/files/pages/f329f2b1-6945-43df-9e96-f68ec893b116/files/capad2018-marine-national.xlsx>). The primary goal of this system is to establish and effectively manage a comprehensive, adequate and representative system of marine protected areas to contribute to the long-term conservation of marine ecosystems and to protect marine biodiversity. It includes 254 marine parks managed by state and territory governments in coastal waters and 60 marine parks managed by the Australian Government—58 Australian Marine Parks located around the country in offshore waters, the Great Barrier Reef Marine Park, and the remote Heard Island and McDonald Islands Marine Reserve.

Case Study – South Australia's Conserving Nature Strategy

Conserving Nature 2012–2020: A strategy for establishing a system of protected areas in South Australia (Conserving Nature) is the strategic framework for the establishment of protected areas on public and private land in South Australia. It guides targeted additions to the protected area system to improve the long-term sustainability of South Australia's environment.

Conserving Nature identifies priorities for conserving the full range of land-based ecosystems and building the capacity of natural systems to adapt to climate change and other stressors, aiming to increase:

- the area protected within under-represented IBRA bioregions and subregions
- the area protected of freshwater and groundwater dependent ecosystems
- connectivity of fragmented habitat across South Australia's landscapes
- the diversity of species and ecological communities represented in the protected area system
- the area of healthy, well-functioning ecosystems represented in the protected area system.

This strategy places equal importance on protecting places with special meaning or importance to people, including sites with scientific, cultural and spiritual value.

Conserving Nature identifies gaps in the types of environments that are protected, and articulates the priority areas for new protected areas as being within the state's five NatureLinks corridors (<https://www.environment.sa.gov.au/topics/park-management>).

Case Study - Crocodile Islands Maringa Indigenous Protected Area

The Crocodile Islands Maringa Indigenous Protected Area (IPA) Consultation project started in June 2018 with a \$500,000 grant from the Australian Government, through to June 2021.

All IPA projects start with a Consultation Stage, which involves Indigenous-led development of a management plan (including assigning an International Union for Conservation of Nature protected area category or categories to the IPA) and an informed decision by traditional owners to dedicate the area as an IPA. Following dedication, the IPA is added to our National Reserve System and funding is increased to allow traditional owners to manage the area in accordance with the approved management plan.

Located in the Northern Territory, in north east Arnhem land, the proposed IPA covers almost 80,000 hectares of land, including 20 islands and 740,000 hectares of sea country. The proposed IPA is characterised by a tropical climate, with extensive mangrove communities, tidal flats/salt pans, intertidal mud flats, coastal floodplains, monsoon forests, eucalypt open forests, shallow seas and reefs, and a network of near and offshore islands. Twenty-eight nationally listed threatened species occur, or are likely to occur, within the proposed IPA, including the critically endangered Eastern Curlew. Numerous nationally listed marine species (63), nationally listed migratory species (44) and Northern Territory listed threatened species (19) are also found within the proposed IPA. The intertidal mud-flats of the proposed IPA seasonally support the largest aggregation of migratory shorebirds in northern Australia and the islands of the proposed IPA are of national significance for four species of marine turtle.

The traditional owner groups who have country within the proposed IPA are known collectively as Maringa. The IPA project will provide additional protection to an area managed by Maringa for thousands of years and will support the Crocodile Islands Indigenous Ranger team, established in 2011. Work undertaken on the proposed IPA by the ranger team is enormously varied, but there is a strong focus on 'right way burning', biosecurity, the protection of important freshwater and saltwater places, sacred site protection and marine turtle protection. Threat reduction activities focus on buffalo and pigs, as well as the removal of marine debris. Large components of IPA and ranger work are focused on Indigenous community outcomes, including community engagement and education, documenting and utilising the knowledge of elders, building local organisational and workforce capacity, supporting sustainable livelihoods on country, and supporting youth, including through the development of a junior ranger program and engagement with local schools (<https://www.crocodileislandsrangersonline.org/>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional)

The IUCN Green List of Protected and Conserved Areas (Green List) is global certification program that recognises and celebrates equitably governed and effectively managed protected areas. Three New South Wales reserves (Cape Byron State Conservation Area, Arkawal National Park and Montague Island Nature Reserve) were among the first 25 reserves in the world to be included on the Green List during the pilot phase launched at the World Parks Congress in 2014. By continuing to participate in the Green List initiative, New South Wales is demonstrating effective management of its reserve system (<http://www.environment.nsw.gov.au/parktypes/Green-List.htm>).

Australia co-hosted the sixth International Union for the Conservation of Nature (IUCN) World Parks Congress over four days in November 2014, in partnership with the IUCN. Parks Australia and the New South Wales National Parks and Wildlife Service led Australia's engagement.

Over 6000 delegates from 170 countries attended with opportunity for Australia to showcase initiatives with field trips arranged across Australia—from the nearby Blue Mountains in New South Wales to Uluru-Kata Tjuta in the Northern Territory, to Tasmania.

The IUCN developed the *Promise of Sydney* as the main legacy outcome from the Congress. The Australian Government made a range of announcements at the Congress and these are considered part of the national pledges that contribute to the *Promise of Sydney*. These include:

- a ban on capital dredge disposal in the Great Barrier Reef Marine Park
- an historic agreement with China to ban mining in Antarctica
- support to help develop a resolution to the United Nations General Assembly to prevent poaching and illegal wildlife trafficking

- \$2 million to boost threatened species protection in national parks, AU\$6 million to support Coral Triangle marine protection, AU\$6 million to combat illegal logging across the Asia-Pacific, and \$100,000 for a new university-led initiative to boost the skills of rangers in Australia and throughout the Asia-Pacific region
- \$1.2 million for Bush Blitz, which is an innovative species discovery program borne out of a partnership between the Australian Government, BHP and Earthwatch Australia
- \$700,000 from the \$40 million Reef Trust to clean up marine debris across the Great Barrier Reef
- ongoing commitment to work with the United Nations General Assembly to protect the biodiversity of the high seas (<https://www.environment.gov.au/topics/national-parks/world-parks-congress>).

Aichi Biodiversity Target 12: Reducing risk of extinction

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia is only one of two developed mega-diverse countries in the world, with significantly more unique species than most other countries. Endemism is high, with 94 per cent of frogs, 93 per cent of snakes, 92 per cent of plants, 87 per cent of mammals, 45 per cent of birds and 24 per cent of birds in Australia are endemic to the country (<https://www.environment.gov.au/system/files/resources/51b0e2d4-50ae-49b5-8317-081c6afb3117/files/ts-strategy.pdf>).

Australia State of the Environment 2016 assessed the status of biodiversity across the nation is generally considered poor and worsening, with the main pressures being fragmentation of habitat, climate change, land use change, invasive species and pathogens, altered fire regimes, grazing pressures and changed hydrology.

Evidence has emerged since the 2011 report that the greatest impact on mammals in northern Australia comes from a combination of predation by feral cats following fire and with grazing, as cats are able to hunt more effectively in a cleared environment. Research shows that feral cats feed on or kill 17 nationally listed threatened species, 123 birds, 157 reptiles, 58 marsupials, 27 rodents, 5 bats, 21 frog and 9 medium sized and large exotic mammals. Cats also consume a wide number of insects, spiders, scorpions, centipedes and crustaceans.

The report also notes that approximately 80 per cent of species are at potential risk from the impact of invasive species (<https://soe.environment.gov.au/theme/overview>).

National action

The EPBC Act ensures conservation of biodiversity with national or international significance through a range of statutory measures, including listing endangered species and identifying actions to conserve them. The Australian Government also undertakes a range of non-statutory measures, such as contributing to the implementation of management actions, and supporting science and monitoring, through grant funding; and through the development of policies and strategies that guide national environmental management. As at December 2018, 1857 species were listed as threatened under the EPBC Act, as well as 82 threatened ecological communities (<https://www.environment.gov.au/biodiversity/threatened/species>).

As detailed in section I, Australia's NBSAP has undergone an extensive review and subsequent revision to substantially improve its ability to drive change in biodiversity management priorities and better position Australia to be responsive to changing international biodiversity commitments and new and emerging priorities.

Australia established a Threatened Species Commissioner in 2014. This new role brings a new national focus to conservation efforts and is helping to address the growing number of native flora and fauna in Australia facing extinction. The Commissioner model has proven successful in approach to:

- work collaboratively with the national Threatened Species Scientific Committee and the community, including the non-profit sector, industry, scientists and all levels of government

- broker solutions that avoid the extinction of our native species, building on and facilitating new initiatives and strategic approaches to threatened species conservation
- consult and raise awareness and support for, threatened species in the community
- applies an evidence-based approach to ensure that conservation efforts and investment are better targeted, more coordinated and more effective
- complements the Australian Government's responsibilities for threatened species protection and recovery under our national environmental law, the EPBC Act, by having oversight of the development, implementation and reporting of threatened species recovery programs.

The *Threatened Species Strategy*, launched in 2015 under the Threatened Species Commissioner model, includes hard and measurable targets to ensure accountability for outcomes. The *Threatened Species Strategy* responds to the need for a more prioritised, targeted and coordinated approach to managing threats to endangered species, giving our native species a better opportunity to survive and thrive in their natural environment. This strategy has coverage for the period 2015–2020.

A report on the Year 3 targets, released in June 2019 outlined progress against targets to 2018. The report shows good progress has been made towards meeting ambitious targets in the *Threatened Species Strategy*. Six threatened birds and eight threatened mammals have improved trajectories since 2015, more than 18 million hectares of feral cat control has been undertaken to help address the threat posed by feral cats to our native wildlife, and over 61 per cent of our known threatened species are now stored in Australian Seed Bank Partnership seedbanks, providing an important insurance policy for the future. The Australian Government has also supported emergency interventions to prevent extinction for several species, including the Orange-bellied Parrot, Central Rock-rat and Western Ground Parrot. Collective actions progressed with the support of the strategy are making a difference to our threatened species. For example, the Warddeken and Djelk Indigenous Rangers worked with Kakadu National Park managers to improve habitat conditions for the White-throated Grass-wren; and partners such as Zoos South Australia, Victorian Government agencies, non-government organisations, universities and others, worked together to successfully re-establish Mallee-emu Wrens back to South Australia after a devastating fire wiped out their original population (see case study, below).

The final report towards the *Threatened Species Strategy* targets will not be completed until 2020.

Building on the progress reported in our Fifth National Report, and the subsequent release of the 2016–2017 Year 2 Report and 2018 Year 3 Report on our *Threatened Species Strategy*, more than \$255 million has been mobilised for over 1200 projects that include outcomes for threatened species, since 2014.

In 2016, the Australian Government announced a dedicated \$5 million Threatened Species Recovery Fund, supported by the National Landcare Program. The Recovery Fund was put in place to support the work undertaken by local community groups fighting extinction. As at July 2018, a total of 39 projects have been announced as receiving funding. Many of these projects are already generating benefits for threatened species.

Other programs under the National Landcare Program are delivering actions to protect or conserve 23 priority species identified in the *Threatened Species Strategy*. Outcomes include the successful release of captive-bred species back into the wild; mobilisation of volunteers to protect critical breeding habitat for the Hooded Plover; and improvements in the survival of translocated Orange-bellied Parrots, up from 67 per cent in 2014–2015 to 85 per cent in 2015–2016 (Review of the National Landcare Program, 2017).

Sub-national government action

Sub-national governments play an integral role in protecting and recovering threatened species and are critical partners in the Australian Government's approach. They administer their own threatened species programs under respective jurisdictional legislation and collaborate with the Australian Government and other key participants in jointly implementing many recovery programs for nationally listed species. They set targets appropriate to the environmental priorities in their respective land and sea scapes, which vary across the country. They also manage protected areas and reserves and deliver a range of conservation programs.

New South Wales has developed the Saving Our Species Program 2016–2021, a strategic approach to addressing impacts to threatened species to enable their persistence into the future. The New South Wales Government is working with a number of partners to undertake projects that improve habitat and control threats, such as weeding programs and fox baiting; monitor the effectiveness of these projects, and the

response of species and ecological communities to management activities; and support conservation projects in national parks and on private land. The Program has several streams, which includes iconic species, landscape-scale approaches and site specific projects, as well as data deficient species and projects undertaken in partnership with other jurisdictions. Most of the funding goes towards coordinating and delivering existing and new conservation projects; science and research to discover ways of best managing threatened species and ecological communities; and building partnerships and involving more people in projects (<https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/saving-our-species-program>).

The ***New South Wales*** Government has also contracted the Australian Wildlife Conservancy (AWC) and the University of New South Wales (UNSW) to deliver an innovative project to reintroduce locally extinct mammal species into New South Wales National Parks and Wildlife Service (NPWS) reserves. This initiative, first announced in April 2014, will see the return of mammal species not seen in their natural habitat in New South Wales for over 90 years. Nearly 180,000 hectares across three NPWS reserves will be dedicated to the project. Within these areas, AWC and UNSW will establish and manage large introduced animal-free exclusion areas of several thousand hectares, where the mammals will be reintroduced, following introduced predator and other pest animal removal. In 2016, the reintroduction of 13 locally extinct species commenced, including the iconic bilby, numbat, and brush-tailed bettong (<http://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/saving-our-species-program/threatened-species-conservation/featured-projects/reintroducing-locally-extinct-mammals>).

These mammals play a significant role in maintaining the health of ecosystems. Reintroducing them to enclosures in parks where introduced predators and other pest animals have been removed will not only reduce their risk of extinction, but is expected to deliver significant benefits to many other threatened species as well.

The ***Tasmanian*** Government has established the Save the Tasmanian Devil Program, in partnership with the Australian Government. The Program aims to prevent the extinction of the iconic marsupial, the Tasmanian Devil, which has suffered dramatic declines as a result of the Devil Facial Tumour Disease. The priorities for the program include reducing Devil roadkill; establishing a translocated population on Maria Island; off the east coast of Tasmania; maintaining a sustainable population of Devils on the Forestier Peninsula in south-east Tasmania; establishing captive bred populations and monitoring wild populations; determining the genetic diversity of the populations and introducing new Devils to broaden that diversity; and advocating for the species by involving and collaborating a broad range of local, national and international stakeholders (<https://dipwwe.tas.gov.au/wildlife-management/save-the-tasmanian-devil-program/about-the-program>).

Zoos ***Victoria*** is a not for profit, zoo-based conservation organisation, delivering conservation outcomes through three zoos – Melbourne Zoo, Healesville Sanctuary and Werribee Open Range Zoo. In 2014, Zoos Victoria launched its first *Wildlife Conservation Master Plan 2014-19*, which described interventions for 20 species assessed as likely to be extinct in the wild in the next 10 years. Some of the species included were the Baw Baw Frog (*Philoria frosti*) and Eastern Barred Bandicoot (*Perameles gunnii Victorian subspecies*). The interventions and research included captive breeding, captive release, population dynamics research, health and hygiene standards setting, and genetic research (<https://www.zoo.org.au/fighting-extinction/>).

In South Australia, the Bounceback program in the Flinders Ranges, was instigated in the 1990s to tackle key threatening processes and recover populations of the yellow-footed rock-wallaby. Coordinated landscape-scale action has occurred ever since. For example, goat populations have reduced using musters, followed by ground and aerial shooting, with ongoing work (at least annually) occurring across multiple tenures and managers. Large-scale rabbit warren ripping and blasting programs have also removed rabbits from target locations (this was followed by broad-scale reductions through the spread of rabbit haemorrhagic disease in the mid-1990s). Biennial aerial baiting for foxes, alternating with ground baiting, has occurred across large areas, to effectively removed resident fox populations.

As a result of these efforts, populations of yellow-footed rock-wallaby and other target species in South Australia are increasing, and the conservation status of the rock-wallaby has been downlisted. The causes of decline were identified and some of these causes are now effectively managed. Goat and fox control are likely to have contributed most to the remarkable recovery of the yellow-footed rock-wallaby across their range in South Australia.

There has also been increasing community involvement and support, which has had collateral benefits for neighbouring pastoral lands. The enthusiasm and commitment of South Australian Environment Department staff, land managers and volunteers, has been a major driver of the success of the Bounceback program (<https://www.naturalresources.sa.gov.au/aridlands/plants-and-animals/native-plants-and-animals/bounceback>).

Western Australia began one of the largest island restoration programs to provide long term conservation security to twelve mammal species (mostly threatened species) and one bird species. Stage one of the Dirk Hartog Island National Park Restoration Project has been completed with the island declared free of cats, sheep and goats, paving the way for stage two which will see extensive threatened animal reintroductions over a twelve-year timeframe. The project is supported by captive breeding and research programs to monitor populations at both source and reintroduction sites. Successful establishment of four threatened species including rufous and banded hare-wallabies, Shark Bay bandicoots and dibblers from the Perth Zoo captive breeding program has occurred to date (<https://www.sharkbay.org/restoration/dirk-hartog-island-return-1616/>).

Western Australia's (WA) ability to effectively control foxes and feral cats across much of its landscape through the Western Shield program, has ensured that WA can assist conservation programs in other jurisdictions by providing valuable founder animals for threatened species reintroduction programs, contributing to conservation actions at a national scale. WA's conservation programs are undertaken in collaboration with a broad range of local, national and international partners and there is a key focus on scientific excellence to inform conservation and management of our diverse plants, animals and ecosystems (<https://www.dpaw.wa.gov.au/about-us/science-and-research>).

Case Study - Indigenous peoples leading threatened species projects

The Australian Government has provided direct support through the Threatened Species Recovery Fund for Indigenous led threatened species conservation projects such as:

- feral predator control delivered by Indigenous rangers and the Western Australian Department of Biodiversity, Conservation and Attractions to protect the Golden Bandicoot, Bilby and Boodie (Burrowing Bettong) at Matuwa Kurrara-Kurrara Indigenous Protected Area, Western Australia (\$250,000 funding from the Australian Government)
- feral cat eradication on West Island in the Northern Territory, delivered by the Li-Anthawirriyarr Sea Rangers to conduct targeted baiting and cat monitoring for the final stages of the 13,000 hectare island wide eradication project (\$210,000 funding from the Australian Government)
- safeguarding Golden Bandicoots and Brush-tailed Rabbit-Rats in the Dambimangari and Uunguu Indigenous Protected Areas, North Kimberley, Western Australia, through activities such as fire management, controlling feral cats and identifying new populations. These activities are delivered by Indigenous Rangers and traditional owners with support from the World Wildlife Fund and Bush Heritage Australia (\$205,120 funding from the Australian Government)
- the NESP Threatened Species Recovery Hub project '[Indigenous action in threatened species research and management](#)' which provides increased opportunities for formalising Indigenous involvement as partners to co-develop a cross-cultural approach to plan, deliver and monitor on-ground threatened species recovery activities. These types of projects not only bring valuable traditional ecological knowledge to the management of threatened species but also provide Indigenous people and groups opportunities to expand existing work on their traditional lands and seas.

Case Study - Mallee emu-wren given a lifeline through the Threatened Species Recovery Fund

The Mallee Emu-wren is a priority species under the *Threatened Species Strategy*. The species was already critically endangered in 2014 when a large bushfire led to the extinction of populations in South Australia, leaving only three populations in Victoria. On Threatened Species Day in 2017, the South Australia Murray-Darling Basin Management Board received \$225,000 through the Australian Government's Threatened Species Recovery Fund to transfer between 60 to 80 Mallee Emu-wrens back into South Australia in order to re-establish a population.

A total of 78 birds released over two seasonal periods in April and August 2018 appear to have successfully settled into their new location. It is expected that this phase will be completed with follow up monitoring by June 2019. The varied timing of the releases was designed to assist with monitoring the effect of the different seasons and various life stages of the bird species.

This project is being delivered and coordinated by Natural Resources South Australian Murray-Darling Basin on behalf of the South Australian Murray-Darling Basin Natural Resources Management Board. The translocation also draws upon a large team of national experts from the Threatened Mallee Birds Conservation Action Plan Steering committee, with support from scientists, local community, and critical logistics from regional Rotary groups (<https://www.naturalresources.sa.gov.au/samurraydarlingbasin/projects/all-projects-map/mallee-emu-wren-translocation>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional)

Australia continues to foster international cooperation for the conservation of migratory species and their habitat through a range of important agreements, including bilateral migratory bird agreements with Japan (JAMBA), China (CAMBA) and the Republic of Korea (ROKAMBA), the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), the Ramsar Convention on Wetlands, the Agreement on the Conservation of Albatrosses and Petrels (ACAP), and through the East Asian - Australasian Flyway Partnership.

Aligned with its commitment under the Bonn Convention to take concerted actions for Appendix I listed migratory species, Australia is championing the implementation of an International Single Species Action Plan for the Conservation of Far Eastern Curlew through a number of forums and by supporting a high priority project on hunting in the Russian Far East. The project, 'Evaluation of hunting pressure on *Numenius* species (Curlews and Whimbrels) and other shorebirds in the Russian Far East – Stage One: Surveys in Kamchatka', will help document hunting activities in the breeding range of Far Eastern Curlew. The project will:

- identify main areas where hunters and poachers take the majority of shorebirds
- identify the time of year and in which habitats, as well as by what methods shorebirds are harvested
- identify which social groups are engaged in legal hunting for shorebirds and illegal poaching
- quantify the number of shorebirds taken
- propose further actions to manage shorebird hunting and protection measures for Far Eastern Curlew and other threatened species
- gain a better understanding of methodology for future surveys in the other parts of the Russian Far East.

At the 12th Conference of Parties, held in the Philippines from 23–28 October 2017, the Single Species Action Plan for the Far Eastern Curlew was adopted (<http://www.environment.gov.au/biodiversity/publications/australian-national-report-consultative-meetings-nov-2018>).

Aichi Biodiversity Target 13: Safeguarding genetic diversity

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

The Australian Government manages the regulatory and policy framework for access to native genetic resources in Commonwealth areas and sharing the benefits arising from their use. The purpose of the framework is to facilitate access to genetic resources and provide legal certainty for researchers and innovators, while also ensuring sustainable use of biological resources, and obtaining tangible benefits for Australia and the conservation of our biodiversity.

Australia is Party to the International Treaty on Plant Genetic Resources for Food and Agriculture. Treaty obligations are taken into account while developing or amending relevant policies that underpin aspects of relevant agricultural sector strategies. For example, the Grains Industry National Research Development and Extension Strategy 2014 includes:

- access to Australian grains and pastures germplasm collections through the consolidation of previously dispersed crop germplasm collections, into a national genetic resources centre comprised of the Australian Grains Genebank and consolidation of previously dispersed pasture and forage germplasm collections in the Australian Pastures Genebank (Australia's report to the International Treaty on Plant Genetic Resources for Food and Agriculture-2017)
- the Australian Pastures Genebank's mandate, managed by the South Australian Government's Research and Development Institute, aims to ensure conservation of all pasture and forage species, of actual or potential value to Australian agriculture are conserved, maintained and distributed in the form of seed. Stakeholders include meat and livestock, wool, dairy, seed, grains and agricultural organisations as well as the Australian Government Department of Agriculture, Water and the Environment and most state government agencies. The genetic resources in these collections are available to domestic and overseas users through material transfer agreements developed under the Treaty (https://pir.sa.gov.au/research/australian_pastures_genebank).

The Australian Seed Bank Partnership (the Partnership) is a national collaboration of twelve of our leading botanic gardens, state environment agencies, academic institutions and non-government organisations. The Partnership, launched in 2009, delivers a national program of work focussed on *ex situ* plant conservation that supports the Australian Government's priorities to protect and improve the environment. The Partnership supports policy-makers, researchers, and the conservation and restoration sectors to work collaboratively to help safeguard our plant populations and ecological communities for future generations.

The *ex situ* work being undertaken by our conservation seed banks presents an important opportunity for improving the results of *in situ* conservation. This can be achieved by refining germination and cultivation protocols, and identifying appropriate storage techniques for native seeds. This ensures higher rates of success in re-introduction programmes and advances the effective conservation of target species and plant communities. The Partnership is working to increase direct efforts in provenance focussed native seed collecting to increase genetic representation in *ex situ* collections, to support long term conservation and restoration activities.

Australia's conservation seed banks currently hold around 20,300 collections of more than 13,000 species. These conservation seed banks include collections of 1943 species listed as threatened by national and/or sub-national legislation.

The work of the Partnership is guided by an ambitious 10 year Business Plan from 2011 to 2020, which sets out goals, actions and outcomes for the Partnership to achieve. The Partnership has undertaken extensive programs of work with support from government and philanthropic funding, and is on track to deliver against the majority of the Business Plan's identified outcomes (<https://www.seedpartnership.org.au/>).

Other measures for safeguarding genetic diversity are provided under Target 9, where biosecurity measures are in place to identify, control or eradicate invasive alien species to prevent their introduction and establishment.

Case Study – Crop Wild relatives seed collection in Kakadu National Park

In May 2018, the Australian Seed Bank Partnership delivered seed conservation techniques training in Kakadu National Park. Experts from the Australian Grains Genebank, Australian National Botanic Gardens and George Brown Darwin Botanic Gardens joined Kakadu National Park Rangers to deliver training to Kakadu's traditional owners and scientists from Papua New Guinea and Indonesia.

The project team moved south from Jabiru to the Mary River region to collect seed from crop wild relatives such as Sorghum, Cajanus and Vigna. The training covered aspects of plant identification and seed collection, as well as techniques for cleaning, drying and storing seed in the field. The team used a modified version of the Millennium Seed Bank Partnership's drum kits to ensure collections arrive at seed banks throughout

Australia and the Millennium Seed Bank in the best possible condition for research and long-term *ex situ* conservation.

Access and benefit sharing arrangements are an important consideration for the project, as Kakadu National Park is jointly managed by the Australian Government and traditional owners. Research for the commercialisation of genetic material from seed collected from Kakadu National Park requires approval under the national EPBC Act, as well as the support of the Kakadu Board of Management. It is essential that this project and future crop wild relative collecting throughout the country be supported by meaningful access and benefit sharing agreements that ensure the benefits of commercialising genetic material flow back to the Indigenous peoples and local communities from whose country seed is collected.

Funding for the project was provided by the Millennium Seed Bank Partnership, with support from the Crop Trust and Simon Foundation. The Australian Grains Genebank will also be delivering lab based training for the international participants with additional funding provided by the Crawford Foundation (<https://www.seedpartnership.org.au/node/325>).

This case study also appears in section V, Global Strategy for Plant Conservation target 13, as it is also relevant for Indigenous and local knowledge associated with plant resources.

Case Study – Pomaderris seed biology

The Australian National Botanic Gardens (ANBG) has utilised its horticultural, seed banking and research expertise to lead a *Pomaderris* conservation and research project in collaboration with land managers, other botanic gardens and research institutions. The project, which began in 2016 and assisted by the New South Wales Government through its Environmental Trust Research Grants, has involved an *ex situ* collection program and concurrent research into horticulture, genetics and seed biology.

Many Rhamnaceae, including *Pomaderris*, produce seeds with physical dormancy. This means that the seed coat prevents water uptake and therefore germination. Usually this is alleviated by fire (often optimally at temperatures of 80–100°C) or weathering degrading the seed coat. The research group examined the dormancy alleviation threshold (related to fire intensity) and found that 120°C was the optimum for 10 of the 11 species, and germination was very low or nil at lower temperatures. This indicates that for most of the species a very narrow range of high temperatures is required to alleviate seed dormancy. Large recruitment events will therefore require very hot fires, which are very unlikely to occur in the riparian habitat where many of these species grow.

Using the new polyploidy information, the project also investigated whether polyploidy influences seed and seedling traits (such as dormancy alleviation threshold, germination success and seedling growth rates) across many common and threatened *Pomaderris* species. Rarity has been linked to variation in numerous phenotypic and phenological seed and seedling traits, including smaller seed size, slower germination and smaller seedling stature. Ploidy can affect the same traits and may interact with rarity; however, there is surprisingly little known about the ecological outcomes of relationships between ploidy and key traits.

The project examined whether ploidy and rarity in *Pomaderris* were associated with variation in seed and seedling traits that might limit their regeneration performance in fire-prone systems. The team experimentally quantified seed dormancy and germination processes using fire-related heat treatments, and seedling performance under drought stress. The association of seed size with the other seed and seedling traits was also examined.

Across all study species, polyploids had bigger seeds, a faster germination rate, and larger and taller seedlings than diploids. There was a lack of any clear effect of rarity. These findings indicate that there is a higher potential competitive advantage in polyploid than diploid *Pomaderris* during regeneration, a critical stage in the post-fire environment, likely related to their bigger seeds. Land managers could take the diploidy disadvantage into consideration when prioritising conservation of threatened species (Parks Australia Science News April 2019).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

Australia is Party to the International Treaty on Plant Genetic Resources for Food and Agriculture. Treaty obligations are taken into account while developing or amending relevant policies that underpin aspects of relevant agricultural sector strategies (see text above).

The seed banking efforts of the Australian Seed Bank Partnership has been significant in assisting the Australian Government to fulfil its international obligations under the CBD and more specifically, the *Strategic Plan for Biodiversity 2011–2020* and the Aichi Targets, as well as the Convention’s Global Strategy for Plant Conservation (GSPC).

The work of the Partners is contributing to the GSPC’s objectives of understanding, documenting and recognising plant diversity, and ensuring plant diversity is urgently and effectively conserved.

In 2017 the Australian PlantBank at the Royal Botanic Gardens Mt Annan was awarded the Botanic Gardens Conservation International Global Seed Conservation Challenge Award in recognition of making the greatest progress in seed conservation internationally (<http://www.plantbank.org.au/>).

The Partnership continues to make significant contributions. At the end of 2017, all ASBP partners had made seed available for research and restoration efforts throughout Australia and internationally, with more than 35 per cent of listed threatened species secured in conservation seedbanks.

Aichi Biodiversity Target 14: Ecosystem services

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

The main pressures facing the Australian environment are habitat fragmentation and degradation, climate change, land-use change, and invasive species. In addition, the interactions between these and other pressures are resulting in cumulative impacts, amplifying the threats faced by our environment. Evidence presented in the *Australia State of the Environment 2016* indicates that some individual pressures on the environment have decreased since the previous report in 2011, such as those associated with air quality, poor agricultural practices, commercial fishing, and oil and gas exploration and production in our marine environment.

During the same timeframe other pressures have increased—for example, coal-seam gas industry, habitat fragmentation and degradation, invasive species, litter in the coastal and marine environments, and greater traffic volumes in the capital cities (<https://soe.environment.gov.au/theme/overview>). For some parts of our environment, at least, effective policy and management have contributed to improved outcomes for the environment and for people.

Australia’s Biodiversity Conservation Strategy 2010–2030 promoted the importance of ecosystem services through outcomes for maintaining and re-establishing ecosystem functions. These national priority outcomes have been integrated into the various national environment and sustainable agricultural investment programs aiming to reduce fragmentation and increase connectivity, for both land and sea scapes; improve environmental water allocations; and improve the use of ecological fire regimes to conserve biodiversity and protect people, including the National Landcare Program and Biodiversity Fund (<http://www.nrm.gov.au/>).

An example of such outcomes is in South Australia, with a Biodiversity Fund restoration project called Conserving South-western Yorke Peninsula: Local Communities Restoring Critical Habitat and Landscapes Linkages. The project built on existing landholder relationships and an extensive conservation planning process, to significantly scale up on-ground action to achieve whole-of-landscape, biodiversity conservation. Activities included 10,000 hectares of feral animal control, 250 hectares of biodiverse plantings, conservation of coastal habitats across 150 hectares, and 10,000 hectares of environmental weed control (<http://www.naturalresources.sa.gov.au/northernandyorke/projects-and-partners/local-communities-critical-habitat>).

Also in South Australia, Women Together Learning (WoTL) is a non-government farming support organisation that supports learning and development of women in the agricultural sector. Established in June 2017, the aim of WoTL is to encourage rural South Australia to thrive by providing valuable professional development opportunities for rural women throughout South Australia. Through WoTL, supported by the South Australian Government, farming business women are delivering “Towards Sustainability” workshops to

support women in farming businesses. Workshop participants increased their confidence, skill and knowledge of sustainable management of natural resources, and shared learning about their farm business and contributions of sustainable farm practice to the greater community. These workshops recognise that women in farming businesses are often concerned about natural resource management issues, and how they affect the farming business and the wider environment. The workshops aim to help women understand how they can improve management of land at the local level. Between 2016 and 2018, “Towards Sustainability” delivered nine workshops in regional South Australia for a total of about 100 farming women. Workshops are ongoing, particularly focussing on regions affected by exceptionally dry conditions (<http://wotl.com.au/>).

Water used to improve the health of our rivers, floodplains and wetlands is known as environmental water. Managed environmental water is a practical rehabilitation measure in which governments work together to re-introduce some natural variability in river flows to reconnect Murray-Darling Basin rivers floodplains and wetlands for the benefit of the environment.

Environmental water is needed because the Basin’s river systems are often placed under pressure because the natural movement, distribution, and quality of water is altered due to river regulation and infrastructure that was built to support burgeoning communities and agricultural production.

The Commonwealth Environmental Water Holder manages a portfolio of water entitlements with annual allocations that are acquired through the Australian Government’s investment in water-saving infrastructure and strategic water purchasing throughout the irrigation districts of the Basin. The Commonwealth Environmental Water Holder’s decisions about the best use of this water are guided by the *Water Act 2007* and the Murray-Darling Basin Plan (specifically, the environmental watering plan and the Basin-wide environmental watering strategy) (<https://www.environment.gov.au/water/cewo>).

In South Australia, policy, planning and delivery of environmental water to the Murray River is focused on delivering outcomes for the riverine floodplain, channel, and Lower Lakes, Coorong and Murray Mouth. The South Australian Environment Water Program incorporates South Australian delivery of The Living Murray program and elements of the Murray-Darling Basin Plan. It includes engagement across the state with local communities, traditional owners, and with a range of public and private entities, in relation to policy development and planning for delivery of environmental water to priority sites along the South Australian River Murray. Delivery of environmental water has supported the restoration of riverine, floodplain, wetland, lakes and estuarine environments, including supporting drought refuge and habitat restoration for threatened species (<https://www.environment.sa.gov.au/topics/river-murray/improving-river-health/environmental-water>).

The *Victorian Waterway Management Strategy* provides a detailed policy for managing Victorian's waterways over an eight year period, from 2013 to 2020. The vision is that Victoria's rivers, estuaries, wetlands are healthy and well managed, and supporting environmental, social, cultural and economic values that are able to be enjoyed by all communities. Desired long-term outcomes are that the condition of priority river reaches and high value wetlands and estuaries are maintained or improved. Management outcome targets include 5450 hectares of improved riparian vegetation; 7220 hectares of improved wetland vegetation; 70 sites with environmental water managed; 42,800 hectares managed for pest plants and animals; 168 sites with improved instream habitat; 31,400 hectares land with management agreements; and 7990 community members with increased capacity.

In the first four years of implementation (July 2013–June 2017), an assessment has showed delivery of 28,115 hectares of improved riparian vegetation; 18,903 hectares of improved wetland vegetation; 265 sites with environmental water managed; 76,879 hectares managed for pest plants and animals; 413 sites with improved instream habitat; 55,972 hectares of land with management agreements and 15,167 community members with increased capacity. Significant investment has been provided by the Victorian Government to catchment management authorities to deliver these achievements on-ground, with a significant ramping up in recent years via the Water for Victoria program and the Regional Riparian Action Plan. Under Water for Victoria, a record investment of \$222 million is being provided to improve waterway and catchment health over a four-year period from 2016, with \$200 million of this targeted at improving waterway health via the implementation of the *Victorian Waterway Management Strategy* and *Regional Waterway Strategies* (<https://www.water.vic.gov.au/water-for-victoria>).

Australia also safeguards the essential services provided by our marine environment, through the work of the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). NOPSEMA is Australia’s independent expert regulator of safety, well integrity and environmental management for all

offshore petroleum activities in Commonwealth waters. NOPSEMA's Environment Division is responsible for ensuring that all offshore petroleum and greenhouse gas activities in Commonwealth waters are undertaken in accordance with the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Environment Regulations).

The Environment Regulations seek to ensure that every offshore petroleum activity in Commonwealth waters is carried out in a manner that is consistent with the principles of ecologically sustainable development, and so that the environmental impacts and risks of the activity will be to an acceptable and reduced to as low as reasonably practicable. The combination of the regulation of safety, well integrity, and environmental management under a single independent regulator aims to standardise our offshore petroleum regulation to a quality, best practice model. Through its functions to promote and provide advice, NOPSEMA actively engages with industry stakeholders on environmental management matters including oil spill risk evaluation, acoustic impact assessment, matters protected under Part 3 of the EPBC Act and Commonwealth marine parks. NOPSEMA also publishes a variety of resources on its website for community stakeholders to build understanding of the offshore environmental approval process (<https://www.nopsema.gov.au/>).

Case Study – Pollinator observatories – citizen science to reconnect people with nature in cities

The construction and expansion of cities often leads to the loss of biodiversity and ecosystem services. While this loss of species and ecological communities negatively impacts the environment, it also impacts upon the human experience of nature. For all urban land managers, a key question is therefore how to protect, restore or bring back important habitats and species within cities, and improve urban biodiversity and ecosystem services despite ongoing urbanisation.

The National Environmental Science Program's Clean Air and Urban Landscape (CAUL) Hub (\$8.88 million over six years to 2021), which is hosted by the University of Melbourne, is undertaking research focused on the sustainability and liveability of urban environments.

Insects and their ecological interactions with plants and other animal groups are an integral part of urban ecosystems and ecosystem services. But given that most insect are small and fast, they often remain unknown to onlookers and are excluded from many conservation programs. To better engage people with this dimension of urban biodiversity and collect important data on their distribution, CAUL Hub researchers collaborated with the Landcare community group Westgate Biodiversity, to develop *Pollinator Observatories* –a network of flowering plant species that are monitored for plant-pollinator interactions by academic and citizen scientists.

The pollinator observatories program includes a series of seasonal training workshops where CAUL Hub researchers teach citizen scientists the necessary skills to identify a series of native and non-native insect pollinators. During these workshops, participants also make observations of pollinator interactions using the [Beneficial Insects Module](#) of the [CAUL Hub Urban Wildlife App](#).

The pollinator observatories project has shown a successful pathway to engaging people with the insects in their cities. It continues to help reconnect people with nature and showcase the ecosystem services and other benefits that nature provides to people and other species in urban environments. On top of this, it also provides researchers with critical data on the factors and seasonality driving plant-pollinator interactions in urban greenspaces.

Case Study – Environmental flows in the Darling Anabranch

In May 2017, environmental flows down the Darling Anabranch from Lake Cawndilla converged with the Murray River downstream of Wentworth, New South Wales, creating a fish highway not seen for three years. Around 100 gigalitres of environmental water was released between mid-February and May, connecting the lake to the Murray River.

The flow convergence with the Murray River was confirmed by landholders who were monitoring the movement of water across their properties, with high numbers of juvenile golden perch moving into the main river. Each week the New South Wales Office of Environment and Heritage (OEH) received updates, photos and videos from landholders along the Anabranch announcing that the water had arrived.

OEH engaged the services of the Murray Darling Freshwater Research Centre to determine fish movement along the length of the Anabranch by tagging fish and tracking their movements via receivers at various fish ways.

The water was sourced from Commonwealth Environmental Water Holder and New South Wales water holdings, slowly making its way down the river to other users. The release was designed to move water through different parts of the system at the right time, so that benefits extended beyond the local environment, both upstream and downstream through the Murray River system. It also aimed to help native species, such as golden perch, to reach into newly accessible habitat to survive and thrive.

Irrigators, landholders and recreational fishers were taken on a tour of the Anabranch with OEH, the New South Wales Department of Primary Industries Fisheries and the Commonwealth Environmental Water Holder office, with positive feedback on the benefits being seen in the river (<http://www.environment.gov.au/water/cewo/publications/environmental-flows-darling-river-fish-2016-17>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional)

Australia is one of the eight founding partners of the International Coral Reef Initiative (ICRI) established in 1994. This informal collective of nations that now has 60 country members has been pivotal in continuing to highlight globally the importance of coral reefs and related ecosystems to environmental sustainability, food security, and social and cultural wellbeing.

Many nations face similar threats to coral reefs and related ecosystems, as well as similar management problems. Recognising this, Australia contributes to ICRI's objectives are to encourage the adoption of best practice in sustainable management of coral reefs and associated ecosystems, build capacity and raise awareness at all levels on the plight of coral reefs around the world (<https://www.icriforum.org/about-icri>).

Australia, through the Great Barrier Reef Marine Park Authority (GRMPA), co-hosts the current secretariat, along with Monaco and Indonesia for the period 2018-2020, and hosted the general meeting in December 2019. Through the role as Secretariat, Australia aims to continue to strengthen ICRI's effectiveness as a mechanism for global and regional collaboration, and continue to build scientific capacity and innovation in reef management in the face of the many challenges coral reefs face globally. (<http://www.gbrmpa.gov.au/our-work/our-programs-and-projects/international-coral-reef-initiative>).

Aichi Biodiversity Target 15: Ecosystem restoration and resilience

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Protecting ecosystem diversity and restoration of habitat for our native plants and animals has been a primary objective of Australian Government natural resource management programs for the past 25 years. Programs have invested in projects to improve the condition, extent and connectivity of native habitat, organising complementary land and sea management practices; and implementing targeted species-specific conservation including marine and terrestrial ecosystems (Review of the National Landcare Program 2017).

Marine ecosystems

Since 2015, the NESP Marine Biodiversity Hub and Tropical Water Quality Hub are extending efforts to improve understanding about restoration of subtidal and other marine ecosystems. A range of projects have focus on shellfish and coral reefs, saltmarshes, seagrass and kelp bed ecosystems. Projects aim to improve knowledge about these ecosystems to underpin their management, restoration and protection. Activities are contributing to development of best practice restoration, assessing the benefits for restoration and trailing approaches. For example, the Marine Biodiversity Hub has provided research to support restoration efforts to increase the efficiency of shellfish and saltmarsh repair. This work distilled knowledge about the distribution and ecology of shellfish reefs, to identify the environmental, social and economic benefits of conservation and repair, as well as to provide practical guidance for management activities. Research from the Tropical Water

Quality Hub is evaluating a range of coral restoration and assisted recovery techniques trialled in Australia and internationally that are best suited to conditions in the Great Barrier Reef, to develop best practices for post-impact coral reattachment and reorientation. The hubs are also supporting various community of practice groups, and helped in establishing the Australian Coastal Restoration Network in 2017 to assist national coordination and knowledge sharing for particular marine habitat types linking the restoration community efforts to marine research organisations.

The National Representative System of Marine Protected Areas (NRSMPA) now covers around 37 per cent of the Commonwealth marine area, and approximately 45–52 per cent of the area of state and territory waters.

Five new management plans for the North, North–west, South-west and Temperate East Australian Marine Park Networks and the Coral Sea Marine Park came into effect on 1 July 2018. The South-east Marine Park Network management plan has been in effect since 2013. For the first time all 58 Australian Marine Parks now have management plans in effect.

Implementing marine park management plans helps to maintain the resilience of marine ecosystems and their ability to withstand and recover from pressures on marine park values. A monitoring, reporting, evaluation and improvement system is being developed for Australian Marine Parks to help build understanding of marine parks management and how marine parks can contribute to long-term resilience at local and broader scales.

Terrestrial ecosystems

The National Landcare Program is a key part of the Australian Government’s commitment to natural terrestrial resource management. From July 2014 to June 2018, the Australian Government invested \$1 billion to continue its longstanding commitment to delivering on-ground biodiversity and sustainable agriculture outcomes that benefit our community and environment.

Caring for our Country, the predecessor to the National Landcare Program, contributed 10.8 million hectares of native habitat and vegetation projects to conserve native species and enhance the condition and connectivity of habitat. Other benefits include facilitating Indigenous communities to work on their own country to protect and manage cultural and environmental assets (Review of the National Landcare Program, 2017).

Phase Two of the National Landcare Program, will deliver an investment of a further \$1 billion to support targeted action to June 2023. The Australian Government is delivering this investment through partnership with governments, industry, communities and individuals to protect and conserve our water, soil, plants, animals and ecosystems, as well as supporting the productive and sustainable use of these valuable resources.

The National Landcare Program supports nationwide efforts through regional partnerships targeting national priorities, including matters of national environmental significance (threatened species, ecological communities, Ramsar wetlands and World Heritage Areas) to address problems such as:

- loss of vegetation
- soil degradation
- the introduction of pest animals and weeds
- changes in water quality and flows and
- changes in fire regimes.

Anecdotal evidence for the Program indicates that the activities funded have reduced social and economic impacts from natural disaster such as floods and bushfires, improving the ability of natural systems to respond to extreme weather events, major pest or disease outbreaks, or slow growing threats to output or production, such as soil acidification (Review of the National Landcare Program, 2017).

The Australian Government is continuing to support shared stewardship of the environment through investment of \$30 million in a range of locally focused environment programs that support practical action in urban, rural and regional communities. This includes funding for the eradication of yellow crazy ants in North Queensland, a \$5 million Threatened Species Recovery Fund, and continuing support for the National Landcare Network. This funding will ensure that on-ground works on these important national environmental issues continues with the help of local communities.

One collaborative project is operating in the Western Desert region of Western Australia, where the non-government organisation, Bush Heritage, and the Birrilburu Rangers, work in partnership to adopt a two-way science approach and undertake traditional mosaic burning for the long-term protection of habitat for the Bilby, the Night Parrot and the Great Desert Skink (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>). This project not only improves habitat for these threatened species, but reduces the likelihood of hot fires that release more carbon into the atmosphere.

In the Tasmanian Midlands, a project is underway to rebuild the threatened ecological community *Eucalyptus ovata* – *Callitris oblonga*, through establishing more than 250,000 native plants and establishing 300 hectares of wildlife corridors along waterways and between patches of remnant vegetation (Threatened Species Strategy Year Three Report, 2019). This will provide habitat connectivity for a range of species, as well as working towards restoring this particular ecological community.

The Australian Government is working with the community to plant 20 million trees by 2020, to re-establish green corridors and urban forests. The Program involved competitive grants, delivered by individuals and organisations (more than 160 projects), and larger-scale plantings, delivered by service providers.

The 20 Million Trees Program is part of the national stream of the National Landcare Program, and has four strategic objectives to:

- plant 20 million trees and associated understorey by 2020
- support local environmental outcomes by improving the extent, connectivity and condition of native vegetation that supports native species
- work cooperatively with the community
- contribute to Australia reducing its greenhouse gas emissions (<http://www.nrm.gov.au/national/20-million-trees>).

Under the Biodiversity Fund, South Australia completed the Landscape links project in June 2017. This four year project encouraged large-scale revegetation on private land, to create linkages between large patches of bush on private and public land in the Bangham District, in the upper South East of South Australia. The project was focussed on achieving on-ground outcomes for declining woodland birds. The project offered financial incentives to private landholders to enable targeted revegetation in areas where they were most likely to achieve outcomes for target bird species. The landholders received a high level of support to establish wide biodiverse revegetation corridors on their properties, which would also provide suitable habitat for target bird species. The project also undertook weed control and pest animal control in significant patches, to prevent spread of pests via revegetated corridors. Corridors are protected on their respective property titles through management agreements. One hundred and fifty hectares of biodiverse revegetation was established, connecting 3000 hectares of remnant bushland. One thousand hectares of remnant bushland was protected from weed threats (http://www.naturalresources.sa.gov.au/files/sharedassets/south_east/corporate/180426-2016-17-achievement-report.pdf).

The WildEyre Program, in the western area of the Eyre Peninsula in South Australia, involves five key conservation organisations working together to restore and conserve the unique and diverse ecosystems across over 1.2 million hectares. Under the program, a wide range of restoration has been achieved, including direct seeding to revegetate 625 hectares (on land owned by 13 separate landowners); 4988 hectares of remnant vegetation protected from the negative effects of stock grazing by the erection of 52.4 kilometres of fencing (on nine separately owned private properties); a seedbank, which now contains 354 kilograms of seed, with 1023 kilograms being collected for seeding but only 868 kilograms being used (available for future projects); African Boxthorn weed has been controlled over 35,852 hectares of land along a 400 kilometre coastal strip, including the innovative use of a helicopter to deliver the herbicide; and 168 sites established for Bushland Condition Monitoring, as part of the WildEyre Project across 12 vegetation groups.

Project partners have worked intensively with 15 landholders over the period of this project to undertake remnant vegetation enhancement and/or revegetation on their properties. Work has also been undertaken with 40 landholders to undertake the Bushland Condition and Bird Monitoring initiatives. In the last two years of the project, 130 landholders were advised about undertaking control of boxthorn in a 500 metre buffer around

the main control area, and 20 Indigenous peoples from Ceduna received valuable training and employment, undertaking land management activities (<http://wildeyre.com.au/what-we-do/>).

Case Study – Cumberland Woodland ecosystem restoration

The Cumberland Woodlands are one of the most cleared and highly fragmented ecosystems in Australia, with only 13 per cent of the region's native vegetation remaining. The Cumberland Conservation Corridor proposal was developed by key local stakeholders. The establishment of the Corridor contributes to the long-term sustainability of bushland in the Cumberland Plain in Western Sydney, under threat from urban expansion. The Corridor will protect patches of woodland to improve the resilience of this ecological community and support the movement of species through the Corridor.

The Australian Government has acquired two properties under the Cumberland Conservation Corridor, which have made significant contributions to the protection of Cumberland Plain woodland values.

Londonderry is managed in perpetuity for conservation purposes under a Plan of Management implemented by Conservation Volunteers Australia. Management of the land includes activities such as the removal of identified weeds, replacement and new planting, and protection of threatened species, as well as community education events.

Wallaroo is a 38 hectare property managed in perpetuity for the protection of the critically endangered Cumberland Plain Woodland and endangered Cumberland River-flat Eucalypt Forest. The property has good connectivity with Mulgoa Creek, and forms an important corridor from Mulgoa Nature Reserve and the Wearn Biobank to the north, through to Cumberland Plain Woodland located on private property to the south.

Over 70 fauna species have been identified on the property including the vulnerable Large-Eared Pied Bat and 66 native flora species.

Wallaroo is managed in perpetuity for conservation purposes under a Plan of Management implemented by the Cumberland Land Conservancy. Priority actions on the property include removal of debris, management of exotic species, access management and revegetation. Community events and educational activities are also held on the Mulgoa property (<http://www.nrm.gov.au/national/20-million-trees>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

The International Partnership for Blue Carbon aims to build awareness, share knowledge and accelerate action to protect and restore coastal blue carbon ecosystems for climate change mitigation and adaptation.

Blue carbon is the carbon stored in mangroves, tidal marshes and seagrasses. Improved management of these ecosystems can enhance food security, secure livelihoods, increase resilience and contribute to delivering Nationally Determined Contributions (NDCs) through carbon sequestration and adaptation.

Launched by the Australian Government in 2015, at COP21 in Paris, the Partnership brings together governments, non-profit organisations and research organisations to increase the understanding of, and accelerate action on, coastal blue carbon ecosystems.

The Australian Government is supporting countries in the Indo-Pacific region to build their capacity to protect coastal blue carbon ecosystems. This includes a \$6 million Pacific Blue Carbon Initiative and a \$2 million Indonesia-Australia Program. Both programs will strengthen blue carbon expertise and data, support integration of blue carbon into national greenhouse gas accounting and climate policy, and encourage public and private sector investment.

In October 2018, Parties to the Ramsar Convention on Wetlands of International Importance adopted a resolution on coastal blue carbon ecosystems proposed by Australia. The resolution encourages protection and restoration of these ecosystems by providing practical tools and support (<http://www.environment.gov.au/climate-change/government/australia-work-on-blue-carbon>).

Aichi Biodiversity Target 16: Nagoya Protocol on Access and Benefit-sharing

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia's national EPBC Act and its associated regulations aligns with the obligations under the Nagoya Protocol. Our access and benefit-sharing laws depend on the location where biological samples are collected and the type of permit(s) required depends on where the samples are to be collected (<http://www.environment.gov.au/topics/science-and-research/australias-biological-resources/nagoya-protocol-convention-biological>).

Australia's *Environment Protection and Biodiversity Conservation Regulations 2000* regulate access to resources in Commonwealth areas and benefit sharing arrangements. Between January 2014 and December 2018, 206 permits have been issued under the access and benefit-sharing provisions of the Regulation. These permits have been issued to a broad range of organisations, including universities, in Australia and international, museums, sub-national government departments, private organisations and individuals (<http://www.environment.gov.au/topics/science-and-research/australias-biological-resources/access-biological-resources-commonwealth>). Sub-national governments in Australia also have their own permitting procedures, specific to each jurisdiction.

Australia also strictly controls the international movement of native wildlife and plants, and their derivatives. Permits are required under the EPBC Act to import or export a CITES-listed specimen, export an Australian native specimen and to import some live animals and plants. The only native species not requiring a permit are covered by the List of Exempt Native Species (LENS). If the plants or animals are protected they will also need to come from an approved source (<http://www.environment.gov.au/biodiversity/wildlife-trade/do-i-need-permit>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

Australia is a major contributor to Kew's Millennium Seed Bank partnership (MSBP) through the Australian Seed Bank Partnership (ASBP). Scientists from Kew's MSBP are sharing their expertise with national and sub-national members of the ASBP on seed collection processes, conservation and research. The overall priority is to bank plant species considered rare or threatened in order to dramatically enhance the conservation of the Australian flora.

ASBP is operating as a project under the Council of Heads of Australian Botanic Gardens (CHABG) and has evolved into a major contributor progressing plant conservation across the country and internationally.

Kew has partnership agreements with each of the sub-national governments, as well as with CHABG. These outline the nature of the collaboration, make explicit the uses of the collections and associated data, and the sharing of benefits arising from the collaborations.

Australia joined the MSBP Global Tree Seed Bank Project in Phase 1 and is contributing to this ambitious project which aims to collect, bank and conserve >3000 of the world's rarest, most endangered and most useful tree species, saving them from extinction. The ASBP has a collection target of 380 species for the Global Tree Seed Bank Project during four years (2014–2017).

Aichi Biodiversity Target 17: Biodiversity strategies and action plans

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Being current over the period 2014 to 2018, *Australia's Biodiversity Conservation Strategy 2010–2030* (the Strategy) remained the guiding framework for governments, business and the community to conserve the

nation's biodiversity. This framework also functions as a policy umbrella influencing other more specific national policies that contribute to implement CBD principles, including:

- *Australian Government's Threatened Species Strategy* (2015)
- *Revised Australian Weeds Strategy* (2017-2027)
- *Revised Australian Pest Animal Strategy* (2017-2027)
- *Australia's Strategy for the National Reserve System 2009-2030* (2009)
- *National Vegetation Framework* (2012)

Following the review of the Strategy in 2016, all Australian governments collaborated to revise the national strategy, in consultation with the Australian public. In November 2019, *Australia's Strategy for Nature 2019-2030* was endorsed by the Australian, state and territory environment ministers as the new approach to biodiversity conservation. The new Strategy is supported by a dedicated website, Australia's Nature Hub (www.australiasnaturehub.gov.au).

Both the Strategy and the Hub are developed and owned by the Commonwealth, all state and territory governments and the Australian Local Government Association. The revised Strategy improves its ability to drive change in biodiversity management priorities and provide better alignment with Australia's international biodiversity commitments. More information on the new Strategy is included in the Introductory section, noting that this report refers to implementation and operation of the 2010 Strategy (<http://www.environment.gov.au/biodiversity/conservation/strategy>).

The Australian Government's *Threatened Species Strategy* aims to address the decline of Australia's threatened species through a more action-based, prioritised and coordinated approach to managing threats and conserving habitat. The Threatened Species Strategy includes priority actions and targets that demonstrate contributions to Aichi Target 12 for the prevention of species extinctions and improvement in conservation status. Progress reports were released in 2016, 2018 and 2019 to track achievements and momentum towards the targets, as well as to highlight the cooperative projects being undertaken by a broad range of stakeholders (<http://www.environment.gov.au/biodiversity/threatened/publications/strategy-home>).

Over this reporting period, some sub-national governments renewed delivery of approaches to biodiversity conservation via their own biodiversity targets and goals to compliment Australia's national approach and the CBD targets.

- Victorian Government's *Protecting Victoria's Environment - Biodiversity 2037* released in 2017. The vision and goals of the Biodiversity Plan reflect the three main priorities of the national Strategy, consistent with Convention Strategic goals: engaging all Australians in biodiversity conservation; building ecosystem resilience in a changing climate; and getting measurable results. The Biodiversity Plan establishes priorities for action, and clear targets that will support the Victorian Government to align its specific priorities and investments within a broader national context (<https://www.environment.vic.gov.au/biodiversity/biodiversity-plan>).
- Queensland Government began consultations in 2018 on the development of a draft Biodiversity Strategy, aiming to encompass views from the public, Indigenous peoples, local government, and the scientific and conservation community. It aims to enable a broad range of stakeholders to collaborate, prioritise and implement better management and protection of biodiversity (https://www.qld.gov.au/data/assets/pdf_file/0017/88100/proposed-biodiversity-strategy-framework-queensland.pdf).
- *No Species Loss – A Nature Conservation Strategy for South Australia 2007–2017* focuses on a strategic approach to reducing loss of biodiversity, particularly through better coordination of a broad range of sectors, from government to community, Indigenous peoples partnerships between government, industry and community, including Indigenous peoples. The Strategy recognises and complements Australia's international and national obligations and priorities (https://www.environment.sa.gov.au/topics/Ecosystem_conservation/No_species_loss).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

Not applicable.

Aichi Biodiversity Target 18: Traditional knowledge

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

The Australian, state and territory governments collaborate with Indigenous peoples to develop policies and programs relating to Indigenous land and sea management. Each jurisdiction fosters relationships with a number of key Indigenous groups to give guidance on supporting Indigenous values in conservation and environment, land rights, native title and natural resource management.

As detailed in Section II, Measure 5, at a national level the Indigenous Advisory Committee (IAC) is a statutory committee established by the EPBC Act to advise the Australian Government on policy and implementation matters relating to implementation of the Act, particularly Indigenous land and sea management. The IAC has contributed advice ensuring recognition of and support for the further transfer of Indigenous traditional knowledge is integrated in national biodiversity policy, programs and regulatory decisions.

National joint management arrangements with Indigenous peoples for many of the Commonwealth reserves and parks continue, including Kakadu and Uluru-Kata Tjuta in the Northern Territory, Booderee, located in New South Wales, Australia's Marine Park reserves and some internationally recognised wetlands (Ramsar listed). Management boards and committees are made up mostly of Indigenous peoples, with an emphasis on managing, protecting and promoting the Indigenous culture and values of the local area. Indigenous peoples play a key role in managing the parks, leading visitor experience activities, to species surveys, fire management and heritage protection (<https://www.environment.gov.au/topics/national-parks>).

Australia's Indigenous Protected Areas (IPAs) program has been assisting Indigenous communities to voluntarily dedicate their land or sea country as Indigenous Protected Areas (IPAs) since 1997.

IPAs are areas of land and sea country owned or managed by Indigenous groups, which are voluntarily managed as a protected area for biodiversity conservation through an agreement with the Australian Government. Indigenous Protected Areas are an essential component of our National Reserve System, which is a network of formally recognised parks, reserves and protected areas.

Most IPAs are dedicated under International Union for Conservation of Nature (IUCN) Categories 5 and 6, which promote a balance between conservation and other sustainable uses to deliver social, cultural and economic benefits for local Indigenous communities.

As detailed in section II and III, IPAs protect biodiversity and also combine traditional and contemporary knowledge into a framework to leverage partnerships with conservation and commercial organisations, and provide employment, education and training opportunities for Indigenous peoples in remote areas. There are currently 75 dedicated Indigenous Protected Areas across more than 67 million hectares. These account for more than 44 per cent of the National Reserve System's total area (<https://www.pmc.gov.au/indigenous-affairs/environment/indigenous-protected-areas-ipas>).

IPA projects are supported through a multi-year funding agreement. Many Indigenous organisations also supplement this funding through fee-for service or other income generating activities, as well as support from private sector and philanthropic organisations.

Indigenous ranger projects were first funded in 2007 through the former Working on Country Program and create meaningful employment, training and career pathways for Aboriginal and Torres Strait Islander people in land and sea management, complementing the IPAs. Indigenous ranger funding has created more than 2000 jobs for Indigenous peoples around the country.

Indigenous ranger projects support Aboriginal and Torres Strait Islander peoples to combine traditional knowledge with conservation training to protect and manage their land, sea and culture. These projects also develop partnerships with research, education, philanthropic and commercial organisations to share skills and

knowledge, engage with schools, and generate additional income and jobs in the environmental, biosecurity, heritage and other sectors.

By achieving employment and environmental outcomes, alongside wider social, cultural and economic benefits, Indigenous ranger work is valued by many communities across Australia. In August 2018, there were 120 Indigenous ranger groups, and together with IPAs, the two programs have created over 2900 jobs in land and sea country management for Indigenous Australians.

The Torres Strait Regional Authority (TSRA) Land and Sea Rangers, funded under the National Landcare Program, are responsible for carrying out a variety of on-ground activities, including pest and weed control, marine debris management, surveillance and monitoring, dugong and turtle management, seagrass monitoring, cultural heritage site protection, and traditional ecological knowledge recording and management.

The TSRA and Sea Management Unit (LSMU) coordinate the delivery of environmental management initiatives across the Torres Strait region, through a partnership approach between TSRA, traditional owners, all levels of government, research organisations and other stakeholders. The LSMU helps traditional owners and communities to access resources and information about the sustainable management of their islands and seas, and to have their say and get involved in caring for the region and its unique values.

The LSMU also operates as the regional natural resource management (NRM) body for Torres Strait, in terms of its responsibility for delivering the National Landcare Program, Indigenous Rangers – Working on Country, Indigenous Protected Areas and Queensland Regional Natural Resource Management Investment programs (<http://www.tsra.gov.au/the-tsra/programmes/env-mgt-program/managing-our-islands-and-sea-country/land-and-sea-rangers>).

Traditional Use of Marine Resources Agreements describe how Great Barrier Reef traditional owner groups work in partnership with the Australian and Queensland Governments to manage traditional use activities on their sea country.

These formal agreements are developed by traditional owner groups and accredited by the Great Barrier Reef Marine Park Authority and the Queensland Department of Environment and Science. Each agreement operates for a set time after which it is renegotiated. An agreement may describe how traditional owner groups wish to manage their take of natural resources (including protected species), their role in compliance, and in monitoring the condition of plants, animals, and human activities, in the Great Barrier Reef Marine Park.

The Traditional Use of Marine Resources Agreement implementation plan may describe ways to educate the public about traditional connections to sea country areas, and ways to educate other members of a traditional owner group about the conditions of the agreement (<http://www.gbrmpa.gov.au/our-partners/traditional-owners/traditional-use-of-marine-resources-agreements>).

The National Landcare Program has resulted in an increase in Indigenous involvement in natural resource management. Building Indigenous engagement and participation has been a priority for this Program and a range of Indigenous land management initiatives use the traditional knowledge, innovations and practices of Indigenous peoples to produce environmental, employment and enterprise development outcomes (Review of the National Landcare Program, 2017). More detailed examples are provided in section VI.

The Green Army Program achieved an Indigenous participation rate of 15 per cent and provided pathways for Indigenous participants of the program to engage in further employment, including ranger programs. The evaluation of the program identified the future opportunity for the Australian Government to build on this high level of engagement, by working closely with the contracted Service Providers to support Indigenous participants to transition from their participation in funded project activities into employment, particularly employment with an Indigenous focus, on completion of a project.

Western Australian initiatives stemmed from the amendments to the State's conservation legislation in 2011 enabled Aboriginal groups to have a formal role in the management of Western Australia's nature reserves, national parks, conservation parks, marine nature reserves, marine parks and marine management areas, and recognised the intrinsic connection that Aboriginal people have with the land and sea. These amendments provided a statutory framework for the implementation of existing, and negotiation of future, native title agreements. Since that time, the joint management program has grown rapidly and this is expected to continue. Ten formal joint management agreements (JMAs) have been negotiated in the Kimberley and

Pilbara regions, covering over 2.6 million hectares of land and water. Joint management negotiations with a number of other native title groups are well advanced. As part of the South West Native Title Settlement, the State will enter into joint management arrangements with the Noongar people for at least six national parks.

The *Plan for Our Parks* initiative aims to secure five million hectares of new and expanded national parks, marine parks and other conservation reserves over the next five years. Most of these lands were originally purchased to achieve the goals set out in the National Reserve System Program. Through this initiative, the Western Australian government will work with traditional owners to create and jointly manage additions to the conservation estate.

In 2017, the Western Australian government introduced a five-year, \$20 million Aboriginal Ranger Program. The program is aimed at helping Aboriginal people manage country and protect landscapes and biodiversity across Western Australia in partnership with the public and private sectors. The initial round of 14 projects has seen 100 rangers employed, with 50 per cent being women. Activities include biodiversity monitoring and research, traditional knowledge transfer, fire management, cultural site management, feral animal and weed control, guided tours, welcome to country activities and visitor management. Round two will see a further 13 projects with 85 new jobs and training opportunities provided.

New South Wales also adopts joint management of their parks and reserves through a partnership arrangement whereby with Indigenous peoples and National Parks and Wildlife Service (NPWS) staff working together to protect natural and cultural heritage. Joint management ensures continuing practice of traditional contemporary culture and self-determination and contributes positive outcomes for both parties, including productive working relationships, connection to country, better management of natural and cultural heritage and social and economic outcomes for Indigenous communities.

In 2018, 31 joint management agreements encompassing around 30 per cent of the NPWS estate in New South Wales were in place and nine other joint management agreement negotiations in progress (<https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/park-management/aboriginal-joint-management>).

Victorian initiatives—The Aboriginal Water Program allocated \$4.7 million over four years under the *Water for Victoria Plan*, to establish a state-wide aboriginal Water Program that better recognises and understands Aboriginal water values, uses and objectives, including investing in local Aboriginal projects across the state. Under the Program, the water sector will partner with traditional owners to incorporate Aboriginal water values and traditional ecological knowledge in water planning, including through shared benefits and using Aboriginal Waterway Assessments.

There is also an investment of \$5 million to develop a roadmap for access to water for economic development, in partnership with traditional owners and Aboriginal Victorians. The Program will build capacity across the water sector and with traditional owners, to increase Aboriginal participation and inclusive practices in water management (<https://www.water.vic.gov.au/aboriginal-values/the-aboriginal-water-program>).

The Victorian *Traditional Owner Settlement Act 2010* (the Act) provides for an out-of-court settlement of native title. The Act allows the Victorian Government to recognise traditional owners and certain rights in Crown land.

Under the Act, a settlement package can include:

- a Recognition and Settlement Agreement to recognise a traditional owner group and certain traditional owner rights over Crown land
- a Land Agreement, which provides for grants of land in freehold title for cultural or economic purposes, or as Aboriginal title to be jointly managed in partnership with the state
- a Land Use Activity Agreement, which allows traditional owners to comment on or consent to certain activities on public land
- a Funding Agreement to enable traditional owner corporations to manage their obligations and undertake economic development activities

- a Natural Resource Agreement to recognise traditional owners' rights to take and use specific natural resources, and provide input into the management of land and natural resources (<https://www.justice.vic.gov.au/your-rights/native-title/traditional-owner-settlement-act>).

In 2017, landmark legislation passed through the Victorian Parliament to protect the Yarra River for future generations. In an Australian first, the *Yarra River Protection (Willip-gin Birrarung Murron) Act 2017*, enables the identification of the Yarra River and the many hundreds of parcels of public land it flows through, as one living, integrated natural entity for protection and improvement. Additionally, to underline the importance of the public parklands and open spaces along the Yarra River within metropolitan Melbourne, the Act allows these to be collectively declared as the Greater Yarra Urban Parklands.

The Act is the first in Victoria to use the language of traditional owners in its title, and one of the first in Australia to include traditional owner language in the text of the Act. Woi-wurrung language is used in recognition of traditional owners' custodianship of the river and connection to the lands through which the river flows.

The first Yarra Strategic Plan is also being developed. This will guide future land use and development along the river corridor, and identify areas for greater protection. It will also provide a decision-making framework for future investment that will bring to life the environmental, social and cultural principles of the Act. A partnership approach has been initiated with the relevant Registered Aboriginal party, and engagement with all traditional owners of contested land is occurring (<https://www.planning.vic.gov.au/policy-and-strategy/waterways-planning/yarra-river-protection>).

Case Study – Warru Recovery Project

The integration of traditional knowledge and a strong collaboration between traditional owners, local communities, researchers and government agencies has been critical to the success of the Warru Recovery Project in South Australia's Anangu Pitjantjatjara Yankunytjatjara (APY) Lands.

The APY Lands, in the far north-west of South Australia, is home to the Black-footed Rock Wallaby, or Warru, as it is known by Anangu, traditional owners of the region. Warru were once an important food resource for Anangu and form part of *Tjukurpa*, their dreaming, law and stories. Warru once roamed widely across central Australia, occupying rocky habitats across the arid areas of South Australia, Western Australia and the Northern Territory. Predation by foxes, cats, wild dogs and dingoes, combined with widespread habitat degradation through grazing pressure, invasive plants and changes to fire regimes, has pushed the Warru to the brink of extinction, particularly in South Australia. The loss of two of the four remaining populations of Warru in South Australia since the mid-1990s, has highlighted the plight of this species, leading to the employment of Indigenous Warru Rangers and the establishment of the Warru Recovery Team (WRT) in 2007.

The WRT is an ongoing partnership between government agencies, researchers, local communities, Zoos SA, APY Land Management and traditional owners. One of the major goals of the Warru Recovery Program is the successful reintroduction of Warru into areas of recent local extinction within the APY Lands. In 2007, with the approval of Anangu elders, 22 Warru were taken from the wild to establish a breeding program. Captive-bred individuals were subsequently released into a purpose-built, predator-free enclosure known as the Warru *Pintji*. In 2017, the project marked a major milestone with the first wild release of Warru at Wamitjara in the APY Lands. While the Warru *Pintji* was initially envisioned as an opportunity to prepare Warru prior to release, the success of breeding within the enclosure has now enabled multiple releases to wild populations, with subsequent translocations planned for the future.

The remote nature of the APY Lands provides significant challenges in both understanding the ecology of native species and managing the recovery of threatened species within this region. Anangu elders are actively involved in the decision-making process, oversee many aspects of the reintroduction program and promote the program within their communities. The WRT ensures that the program provides significant employment, training and capacity building opportunities for Anangu people. Indigenous Warru Rangers are involved with predator, weed and fire management in the region, as well as the captive breeding, translocation and monitoring of Warru. This practical on-ground threat management, based on traditional ecological knowledge, has been critical in the persistence of the reintroduced Warru at Wamitjara and in the protection of the remaining *in-situ* populations. These management measures also have broader landscape-scale environmental

benefits for other threatened fauna and flora in the region. The Warru Recovery Program provides a unique example of the development by Anangu elders of a modern *Tjukurpa*, incorporating story, painting, and song and dance about this conservation project on their land. The *Tjukurpa* about the Warru Recovery Program is added to, as new elements of the program are implemented (<https://www.naturalresources.sa.gov.au/alinytjara-wilurara/projects/warru-recovery-program>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

The Kokoda Track in Papua New Guinea has historical significance for the people of Papua New Guinea and Australia as the site of some of the fiercest battles between Japanese and Australian Forces in World War II. It is a powerful symbol of the goodwill and enduring relationship between Papua New Guinea and Australia. The track is popular for trekkers who want to experience the physically challenging 96 kilometre walk, attracting over 3000 trekkers each year.

The Kokoda Initiative is a partnership between the Government of Papua New Guinea and Australia to sustainably develop and protect the Kokoda Track and the surrounding Owen Stanley Ranges. The Kokoda Initiative reflects the strong commitment of both governments to continue to enhance the quality of life of communities living along the track, to protect the environment, cultural values and to keep the track open and well managed.

The Kokoda Initiative is led by the Government of Papua New Guinea. The Australian Government plays a supporting role in implementing the Initiative, including through co-funding and technical and policy advice. The Australian Government Department of Foreign Affairs and Trade (DFAT), through the Australian High Commission in Papua New Guinea, leads Australia's involvement in the Kokoda Initiative. It works with Papua New Guinea's Conservation and Environment Protection Authority to deliver the Kokoda Initiative.

The Australia Government Department of Agriculture, Water and the Environment provides technical and policy advice to Papua New Guinea's Conservation and Environment Protection Authority on environment and heritage conservation and protection activities, including seeking World Heritage listing for the Kokoda Track and the Owen Stanley Ranges.

In September 2015, the Prime Ministers of Papua New Guinea and Australia signed the Papua New Guinea-Australia Joint Declaration on the Preservation of the Kokoda Track Region. This extends the Kokoda Initiative beyond 2015, through an enduring partnership which recognises the significance of the Kokoda Track, its people, and the environment. Phase Three of the Initiative began in January 2016 and is scheduled to conclude in June 2020. Phase Three prioritises three Pillars of Support:

Pillar 1 The Track: Track management, keeping the Track open, safe, well-managed and preserved as shared heritage.

Pillar 2 The People: Development for track communities, including in service delivery and improved economic opportunities.

Pillar 3 The Environment: Environmental (biodiversity and cultural heritage) protection, including potential working towards a World Heritage listing of the region.

The Kokoda Track passes through the Owen Stanley Ranges, which are rich in natural resources. The ranges are home to thousands of unique plants and animals, making them one of the most biologically diverse and important areas in the Asia Pacific. There are also many cultural sites and artefacts which show people's long relationship with this land, such as old village sites, spirit places, cemeteries and archaeological sites. The Brown River catchment, located within the Owen Stanley Ranges, has been identified as a potential source of clean water and energy for Port Moresby.

High use of the Track by trekkers and other potential land uses, such as mining and forestry, could put pressure on the conservation of these special values. Through the Kokoda Initiative, the Papua New Guinean and Australian Governments are working together to promote sustainable development of this area, and protect its important natural, cultural and military heritage values (<https://www.environment.gov.au/heritage/international-projects/papua-new-guinea>).

Aichi Biodiversity Target 19: Sharing information and knowledge

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia's state of the environment report series is developed once every five years and provides a comprehensive national assessment of the state of our environment. Written by independent experts, it is an analysis of the best available evidence to provide a clear picture of what is going well and what requires more effort. As indicated earlier, *Australia State of the Environment 2016* is presented in an online interactive format, allowing users to explore different sections of the report according to headline issues, drivers of environmental changes, different themes and topics, as well as through status and trends, effectiveness of management, resilience and risks, and the outlook onto the future. Presentation of the data in this manner enables accessibility to a broader range of interested parties, allowing for an in depth consideration or a quick scan of key issues for consideration (<https://soe.environment.gov.au/>).

Australia's state of the forests report (SOFR) series implement commitments under Australia's *National Forest Policy Statement* (1992) and *Commonwealth Regional Forest Agreements Act 2002*. The report is the mechanism by which the state of our forests, and changes over time in a range of social, economic and environmental forest-related indicators, are reported to government and industry stakeholders, and the broader community. The availability, coverage and currency of data available for the national SOFR series vary considerably between indicators and also between reports in the series, but has been improved overall for SOFR 2018, compared to SOFR 2013.

The national SOFR series presents data on all of Australia's forests, both public and private forests, as well as forests managed for conservation and for production. Trends over time are reported when the data are of sufficient quality and drivers of change are identified if these are clear. SOFR 2018 addresses its purpose of being a comprehensive national report, providing the reader with information to assess progress towards sustainable forest management in Australia (<http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018>).

The Australian Biological Resources Study (ABRS) compiles, curates and makes openly accessible authoritative databases and information resources describing our biodiversity. ABRS works closely with other Biodiversity Science teams in Parks Australia, including the Centre for Australian National Biodiversity Research (Australian National Herbarium), the Bush Blitz Program, the National Seed Bank and the Biodiversity Informatics team, and in partnerships and collaborations with the Commonwealth Scientific and Industrial Research Organisation (CSIRO), museums, herbaria, universities and the Atlas of Living Australia. This includes development, management and maintenance of fundamental national science data and information resources such as the Flora of Australia, Australian Faunal Directory and National Species List.

Through the National Taxonomy Research Grant Program (NTRGP), the ABRS funds research into the taxonomy and systematics of Australian organisms (plants, animals, fungi, etc.). The Bush Blitz program enables scientists to discover and document biodiversity in remote and inaccessible areas of Australia, to enhance our knowledge of the distribution of species, including threatened and invasive species, and to uncover and describe new species. The Centre for Australian National Biodiversity Research and National Seed Bank undertake scientific research that contributes to knowledge of our biodiversity and its conservation.

The data and research generated from all programs and activities is compiled into national databases and resources (such as the National Species List and Australia's Virtual Herbarium) that are openly accessible, are captured by the Atlas of Living Australia, and are ultimately aggregated into international biodiversity data initiatives such as the Global Biodiversity Information Facility (GBIF), World Flora Online and the Catalogue of Life.

Through their seed collecting and research activities, the Australian Seed Bank Partnership (ASBP) partners have captured large quantities of data on phenology (the leaf, flower and fruiting periods), ecology, abundance, seed morphology, germination/dormancy requirements and storage characteristics. The ASBP, in collaboration with the Atlas of Living Australia, has built an accessible online seed information resource, The

Australian Seed Bank online. This virtual seed bank is providing a resource for researchers, students, restoration and conservation practitioners and community groups, as well as the horticultural and nursery industry, in identifying and sourcing seed for research and restoration of our diverse landscapes. The ASBP and the Atlas of Living Australia continue to work together to improve data accessibility to support the conservation of genetic resources from our native plants.

A Reef 2050 Advisory Committee and Independent Expert Panel have been established to advise the Australian and Queensland Governments on implementation and review of the Reef 2050 Plan.

The Independent Expert Panel provides scientific and expert advice related to the Great Barrier Reef, including support for the implementation and review of the Reef 2050 Plan, Reef Water Quality Improvement Plan 2017-2022 and other matters, as requested. The Panel also advises the Australian Government Minister for the Environment and Energy on funding priorities for the Reef Trust.

The Reef 2050 Advisory Committee meets regularly to provide strategic advice on the implementation of Reef 2050 actions, stakeholder priorities, and highlight any emerging cross sectoral issues that need to be addressed.

Both the Panel and Committee enable scientific and stakeholder advice on the Reef to be applied in actions to reduce threats and protect the Reef's biodiversity (<http://www.environment.gov.au/marine/gbr/reef2050/advisory-bodies>).

The Great Barrier Reef Marine Park Authority (GBRMPA) seeks to base its management of the Great Barrier Reef Marine Park on a comprehensive and up-to-date understanding of the Reef - its values and processes, and the pressures affecting it. In 2014, the GBRMPA published a *Science Strategy and Information Needs 2014–2019*, which sets out the future scientific information needs of GBRMPA. It aims to ensure that science activities are relevant, targeted to address critical management issues and their outcomes are easily accessible.

The strategy is based on the outcomes of the *Great Barrier Reef Outlook Report 2014* and the Great Barrier Reef Region Strategic Assessment, plus the critical thinking applied in developing the synthesis documents that informed those reports. Timed around the five-yearly cycle of the Outlook Reports, development of a science strategy is an opportunity for GBRMPA to review and prioritise science information needs in conjunction with its partners. This strategy has a five-year life and replaces a previous version developed following release of the first Outlook Report in 2009. A revised version of the strategy will be developed in response to the 2019 Outlook Report and the knowledge gaps identified through the development of the Reef 2050 Integrated Monitoring and Reporting Program.

The science strategy is designed for use by the agency and its partners, particularly the scientific community (based in research institutions, universities and government agencies), research funding providers, and providers of monitoring and other relevant information such as Reef-based industries, traditional owners and members of the community. Management informed by the best available knowledge is fundamental to ensuring a healthy Great Barrier Reef for future generations (<http://www.gbrmpa.gov.au/sciencestrategy/>).

The Australian Marine Parks Science Atlas is the result of a collaboration between Parks Australia and the Australian Institute of Marine Science. The Atlas provides those interested in marine science with a snapshot of the scientific research and information that underpinned the establishment of the Australian Marine Parks, and the work that Parks Australia and the Australian marine science community are doing to improve understanding of and ability to effectively manage these parks. The National Environmental Science Program contributes research outputs to the Australian Marine Parks Science Atlas (<https://atlas.parksaustralia.gov.au/amps/about>).

The Australian National Insect Collection is recognised both nationally and internationally as a major research collection, used by the Australian and international researchers, industry, government and university students. Managed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), it is growing by more than 100,000 specimens each year. It is the world's largest collection of Australian insects and related groups such as mites, spiders, nematodes and centipedes, housing over 12 million specimens. The Collection researches a number of major bio-diverse and economically important groups of insects and related organisms, and has a mix of staff with specialist skills ranging from collection maintenance and development, through to research. The Collection provides web-based information and tools for the identification of insects and related organisms (<https://www.csiro.au/en/Research/Collections/ANIC>).

In New South Wales, the *Biodiversity Conservation Act 2016* required the establishment of a program to collect, monitor and assess information on the statistics and trends in biodiversity in that state, aimed at informing a review of the legislation in 2022. The New South Wales Government has collaborated with the Commonwealth Scientific and Industrial Research Organisation (CSIRO), as well as the Australian Museum and Macquarie University, to develop the Biodiversity Indicator Program (BIP) to achieve this. The method identifies key indicators for biodiversity in New South Wales. These indicators measure different aspects of biodiversity, including how well efforts at protecting and restoring threatened species are working; how many species are expected to survive in the future; how previous loss of habitat has affected biodiversity; the condition of existing natural areas and how well-connected these are to each other; and the level of pressures and threats to biodiversity. These state-wide assessments will be complemented by case studies, using data from on-ground monitoring programs in important areas for biodiversity or for important species or ecosystems (<https://www.environment.nsw.gov.au/biodiversity/biodiversitybaselineassessment.htm>).

The Australian Government's Regional Natural Resource Management (NRM) Planning for Climate Change Fund (NRM Fund) provided \$43.9 million over five years to improve regional planning for climate change and help guide the location of carbon and biodiversity activities. The Fund delivered through two streams: Stream 1 (\$28.9 million) to support regional NRM organisations to revise existing regional plans; and Stream 2 (\$15 million) to produce regional level climate change information and provide guidance on the integration of that information into regional NRM and land use planning. A final evaluation indicates the program has allowed regional bodies to significantly improve their ability to adaptively plan for climate change, with the embedding of new information and knowledge into regional planning processes. As regional natural resource management organisations adaptively plan for climate change, they will have improved access to responsive, adaptive tools and frameworks; research outputs; and online resources and platforms; as well as improved networks and relationships between researchers, planners and natural resource management representatives (Stream 2 of the Regional Natural Resource Management Planning for Climate Change Fund 2013-2016 Final Evaluation Report, 2016).

Similar to this, the Victorian Coastal Monitoring Program (VCMP) aims to provide communities with information on coastal condition, change, hazards, and the expected longer-term impacts associated with climate change that will support decision making and adaptation planning. Partnerships with community groups (citizen science) and institutions, such as universities and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), to co-invest in coastal monitoring projects at both regional and local scales is central to the success of the VCMP (<https://www.marineandcoasts.vic.gov.au/coastal-programs/victorian-coastal-monitoring-program>).

Case Study – Great Barrier Reef Integrated Monitoring and Reporting Program

The Great Barrier Reef Marine Park Authority (GBRMPA) is working with its partners in the Australian Government, the Queensland Government and researchers to develop an integrated monitoring and reporting program for the Reef and its adjacent catchment. The integrated portal will allow early detection of trends and changes in the Reef's environment, inform the assessment of key threats and future risks, and enable timely management responses. It will also help track the progress towards targets and objectives of the Reef 2050 Plan.

The program will provide a comprehensive and up-to-date understanding of the Great Barrier Reef—the values and processes that support it and the threats that affect it. This will enable timely and suitable responses by Reef managers and partners to emerging issues and risks, and enable the evaluation of whether the Reef 2050 Long-Term Sustainability Plan (Reef 2050 Plan) is on track to meet its outcomes, objectives and targets.

There are currently more than 100 monitoring programs operating in the Great Barrier Reef World Heritage Area and adjacent catchment. These programs have been designed for a range of purposes and operate at different spatial and temporal scales. The comprehensive strategic assessments of the Great Barrier Reef World Heritage Area and adjacent coastal zone—both of which formed the basis for the *Reef 2050 Plan*—identified the need to ensure existing monitoring programs align with each other and with management objectives. The program will drive coordination of existing monitoring programs to fulfil this need.

The Reef 2050 Integrated Monitoring and Reporting strategy defines the vision, development and implementation objectives of the program (<http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3385/8/RIMReP-Strategy-Update-2018.pdf>).

The program will provide information across seven themes that make up the *Reef 2050 Plan* outcomes framework covering ecosystem health, biodiversity, water quality, heritage, community benefits, economic benefits and governance.

The intent of the program is not to duplicate existing arrangements, but to coordinate and integrate existing monitoring, modelling and reporting programs across disciplines.

Program development began in 2016 and involves two distinct components:

- development of an integrated monitoring program for the Reef and its catchment
- development of data management and other tools required to enable use of data for management and reporting.

These components are being delivered across three parallel but related streams of program design, synthesis and reporting and data management and systems.

Effective communication with stakeholders about the program, its development and its current and future capabilities, is critical to successful implementation. In response to this, program managers established an online communications tool to provide clear and up-to-date information on the development and implementation of the program, as well as access to information about existing monitoring and modelling programs. In addition, standard communication products, such as e-newsletters, steering group communiqués, monitoring videos, case studies and brochures will continue to be published (<http://gbrmpa.maps.arcgis.com/apps/MapJournal/index.html?appid=68cbaaff06c24d3e8e7f0686724d9ca6>).

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) was established by international convention in 1982, with the objective of conserving Antarctic marine life. This was in response to increasing commercial interest in Antarctic krill resources, a keystone component of the Antarctic ecosystem and a history of over-exploitation of several other marine resources in the Southern Ocean.

The Australian Antarctic Division helps further the objective of the CCAMLR by providing the science on which to base policy and management decisions.

Australian Antarctic Division research that contributes to CCAMLR is primarily undertaken by research programs addressing the conservation of Antarctic wildlife and the sustainable management of Southern Ocean fisheries. These research programs follow an 'ecosystem approach' as well as a 'precautionary approach' that are consistent with the approach adopted as the basis for CCAMLR. These approaches require that krill, finfish and all other living resources of the Southern Ocean, are treated as an integrated system where the effects on predator, prey and related species are considered, and decisions on sustainable harvesting levels are made on the basis of sound scientific advice.

Australian Antarctic scientists conduct strategic research into issues such as stock assessment of fish and krill populations, incidental mortality of seabirds in long-line fisheries, ecosystem monitoring, the development of novel techniques to examine ecosystem interactions, ecosystem modelling and the research into the life history parameters of harvested and dependent species.

The Australian Antarctic Division's science initiatives have significantly contributed to the development of procedures by CCAMLR and have enabled the commission to make informed ecosystem management decisions, based on the best scientific advice available. Much of the scientific information provided to CCAMLR assists in the development of conservation measures, which regulate activity in the CCAMLR region of the Southern Ocean according to a precautionary approach. Conservation measures under CCAMLR include:

- establish protected species
- set precautionary catch limits

- identify fishing regions
- regulate when fishing may occur and what fishing methods can be used
- establish fisheries inspection procedures.

Australia's Antarctic scientific research program has been and will continue to be the prime source of information to CCAMLR on the harvested species, and on the wider marine ecosystem of East Antarctica (<http://www.antarctica.gov.au/law-and-treaty/ccamlr/aad-science-in-ccamlr>).

The CCAMLR Secretariat is based in Hobart, Australia, and supports the regular meetings and daily functions of the Commission and Scientific Committee, as detailed in the Convention Text. These include:

- facilitating communications with and between Members
- monitoring daily catch and managing fisheries
- producing and distributing publications
- receiving and managing scientific CCAMLR Data
- managing the Catch Documentation Scheme (CDS)
- monitoring compliance with Conservation measures and other decisions of the Commission (<https://www.ccamlr.org/en/organisation/secretariat>).

Aichi Biodiversity Target 20: Mobilizing resources from all sources

Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description.

Australia continues to fund a range of activities both domestically and internationally to support implementation of the *Strategic Plan for Biodiversity 2011–2020* and most of these activities are detailed throughout this report. To realise the potential of available resources, Australia continues to investigate new funding approaches through innovative financial mechanisms and efforts to mainstream biodiversity more generally.

New and innovative financing initiatives that extend Australia's domestic efforts are modelled on public-private partnerships and market based mechanisms, such as offsets and adopting a procurement arrangements to achieve better on-ground outcomes. All are proving to be successful in mobilising resources. Some examples are included below.

- The Australian Government's *Threatened Species Prospectus* which provides a brokering service to mobilise the business sector to be matched as co-investment partners in threatened species conservation. Business, industry and philanthropic sectors are invited to contribute to identify projects designed to prevent further species extinctions. More than 50 projects worth more than \$50 million were scientifically assessed by the Threatened Species Commissioner for including in the Prospectus, in consultation with species experts and conservation communities who are saving species on the ground across the country (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-prospectus>).

To date, more than \$7 million dollars has been mobilised to support 19 projects featured in the prospectus, including funding directed toward efforts to improve nesting habitat of the Shy Albatross, as detailed in the case study below.

- Projects to support the priority species in the *Threatened Species Strategy* have also been undertaken by non-government and philanthropic organisations. For example, there is the construction of safe havens such as Newhaven Wildlife Sanctuary in the Northern Territory (Australian Wildlife Conservancy), establishing conservation areas such as Pullen Pullen in Queensland (Bush Heritage), funding collaborative projects such as the Numbat Detector Dog (Foundation for Australia's Most Endangered Species) and supporting habitat restoration across the country (for example, Greening Australia and Conservation Volunteers Australia). More examples detailed in the strategy progress

reports (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>).

- Since 2014, the Australian Government has committed over \$700 million to the **Reef Trust** to provide innovative, targeted investment to improve Reef health and resilience by taking the best available science and targeting investment to the highest priority threats to the Reef. It is one of the key mechanisms to assist with the delivery of the Reef 2050 Plan.

The Trust is unique in its approach to consolidate investments in the Great Barrier Reef and distribute funds strategically, utilising varying approaches to maximise outcomes for the Great Barrier Reef. The Trust is delivered on a phased basis as new funding is made available by government. This has enabled the Trust to trial innovative financing models, consolidating investment from a variety of sources and diversifying the funding to Reef conservation projects in support of implementation the Reef 2050 Plan. The Trust has delivered competitive tenders, reverse auctions, co-investment partnerships with private sector, and offset funds derived from specific development impacts on the Reef. The Trust is evolving to increase investment capacity and incorporate alternate resourcing mechanisms, including private investment and philanthropic donations. In 2018 the Australian Government established an innovative \$443.3 million Reef Trust Partnership with the Great Barrier Reef Foundation, which will build on the significant efforts to date of the Australian and Queensland governments and other partners to improve the health of the Reef and work towards delivering Reef 2050 Plan outcomes.

- The **National Landcare Program** review in 2016 found that landholders who receive grants often provide significant cash and in-kind contributions to projects, estimated at between \$2.80 and \$16.00 for every government dollar invested. While not uniform across all jurisdictions, the leveraged investment from natural resource management bodies across Australia has matched Commonwealth investment through the Regional Stream element of the Program (Review of the National Landcare Program, 2017).

In addition, as part of its reforms to the regional delivery of the National Landcare Program, in 2017 the Australian Government committed \$450 million to continue the program over five years from July 2018 to June 2023. The new Regional Land Partnerships approach focuses on reducing administration and proportionally increasing the amount of money available on the ground for national environmental significance and sustainable agriculture priorities. Efficiencies have been gained by adopting a competitive tender process to engage regional partners across Australia to deliver a suite of projects that will contribute to achieving Australia's national priorities, consistent with CBD's Strategic Plan.

- The **Green Army Program** has also been successful in leveraging investment from the community through in-kind contributions from Project Hosts, estimated at \$48.8 million. This equates to an average of \$39,000 per project. With an investment of more than \$200 million by the Australian Government through the allocated project fees, the community contributed an additional 24 per cent of the Commonwealth investment to the Program, demonstrating a commitment by the community to invest in environmental and conservation outcomes for their local area (Green Army Year 3 Evaluation Report, 2017).
- **Partnering for a Sustainable Environment Statement**—During 2018 the Australian Government Department of Agriculture, Water and the Environment, in response to the building momentum and interest in public-private partnerships, initiated a co-design process to identify the strengths and resources of diverse partners to achieve sustainable outcomes for the environment. The department was assisted in this process with advice and guidance provided by a multi-stakeholder group. The *Partnering for a Sustainable Environment Statement* resulted as a framework to facilitate new initiatives for working together, opening an invitation to organisations to bring forward partnering ideas across scope of environmental and energy issues. Through this process, stakeholders will be matched to co-design more integrated solutions with those who have shared intentions and/or complementary programs for greater impact. There is scope for partnerships to be simple low commitment information-sharing relationships through to sophisticated initiatives whereby resources are mobilised, benefits and risks are shared and partnering is transformational.

- In 2015, the New South Wales Government released a ***Social Impact Investment Policy*** that sets out the actions it will take to deliver more social impact investment transactions, remove barriers to and promote social impact investment, and build the capacity of market participants. The government has also established an Office of Social Impact Investment and releases annual statements of opportunities, which identify its priorities for future social investment transactions (<https://www.osii.nsw.gov.au/>). To date, these opportunities have focused on social issues such as youth homelessness, employment for young Indigenous peoples, chronic illness management and early childhood education, but the lessons learned, and the tools and resources being developed through this work have the potential to be used in broader fields, including supporting sustainable development (<https://soe.environment.gov.au/theme/overview/topic/policies-tools-and-approaches-are-potentially-changing-outlook>).
- **Murray Darling Basin Balance Water Fund** - The Nature Conservancy in conjunction with specialist asset manager Kilter Rural established the Murray Darling Basin Balance Water Fund (BWF) designed to invest in water for Australian farming families while protecting culturally and ecologically significant wetlands, and support associated threatened species. The fund invests in water entitlements (assets), which are issued by government and bought, sold and leased on the \$10 billion Murray Darling Basin water trading markets. The BWF achieves environmental outcomes by providing water to wetlands on a ‘counter-cyclical’ basis: when water is scarce and demand is higher, more water is made available to agriculture. Conversely, when water is abundant and demand is lower, more water is made available to wetlands. This novel approach delivers economic, environmental and social outcomes by reinstating the natural wetting and drying rhythms of the Basin.

Since inception to June 2018 the holdings have raised \$23.8 million in equity and \$5 million in debt, resulted in around a 2.3 per cent return for investors and delivered water for farmers and environment water to benefit the wetlands and wildlife including fish and waterbirds. Until June 2018—the Fund had enabled the delivery of a total of 2598 ML of water including 107 ML of Fund donated water and 2446 ML of water from the Commonwealth Environmental Water Holder to 21 wetlands across Victoria and New South Wales through six watering events, inundating a total area of 158 hectares of wetlands and floodplains. The Fund also aims to create meaningful employment and engagement opportunities for the Traditional owners of the targeted wetlands and support irrigation communities within the Southern Murray-Darling Basin. The Fund is backed with support of the Murray-Darling Wetlands Working Group and National Australia Bank (Kilter Fund <http://www.kilterrural.com/> and TNC <https://www.natureaustralia.org.au/>).

Social impact investment in conservation is still an emerging area for business and the private sector. Governments in Australia are also looking to facilitate development of a more sophisticated marketplace for impact investment generally (e.g. the legal frameworks, performance metrics and accountability arrangements), and to support the practical use of these tools across the different sectors. Added to the examples above this funding model is also being used by the Clean Energy Finance Corporation to mobilise investment finance to fund improvements in energy efficiency and, to tackle the threats facing the Great Barrier Reef.

Case Study – Preventing the decline of the Shy Albatross

Endemic to Australia, the Shy Albatross only nests on three islands off the coast of Tasmania—Albatross Island, Pedra Branca, and Mewstone. In some parts of the Albatross Island colony, birds struggle to find and keep sufficient nesting material, resulting in poor quality nests.

Higher air temperatures and increased rainfall associated with climate change are reducing breeding success for Australia’s only albatross, and the warming of the ocean may also make it harder for foraging parents to find prey. Monitoring shows that birds with inferior nests are less likely to successfully raise a chick.

Over 100 specially built mudbrick and aerated concrete artificial nests were airlifted on to Bass Strait’s Albatross Island, off the northwest coast of Tasmania, in July 2017, to trial a program aimed at increasing the breeding success of the Shy Albatross.

Conservation scientists and funding partners from the WWF-Australia, WWF's Wildlife Adaptation Innovation Fund, Commonwealth Scientific and Industrial Research Organisation (CSIRO) Marine Climate Impact, Australian and Tasmanian governments and the Tasmanian Albatross Fund, have worked together to place nests in areas where they were typically of lower quality. Recent monitoring shows that the birds are accepting the nests and personalizing them with mud and vegetation.

High quality nests help keep eggs and chicks safe from the harsh weather that hits Albatross Island. More than a year later, a visit to the project site found that, while many of the natural nests had already begun to deteriorate, the artificial nests remained intact.

When the chicks are fully grown and about to fly from the island for the first time, scientists will attach tiny satellite trackers to them to capture the movements of their first few months at sea. This will provide crucial information about why fewer juveniles are surviving.

As the climate continues to change, scientists need to develop, test, and evaluate new approaches to protecting vulnerable species. This collaborative innovation is an encouraging step for the future of the Shy Albatross and can serve as a model for other wildlife recovery efforts (<http://www.environment.gov.au/system/files/resources/86e2d7df-6523-44b4-bb7a-692576bd0d67/files/threatened-species-prospectus.pdf> and <https://www.wwf.org.au/what-we-do/species/shy-albatross#gs.q4uy0o>)

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional).

Australia funds a range of activities both domestically and internationally that support the implementation of the *Strategic Plan for Biodiversity 2011-2020* and contribute to the achievement of the Aichi Biodiversity Targets. Biodiversity-rated outcomes are maximised by leveraging efforts and contributions from a range of sources, including government and non-government sources. The extent of Australia's international financial contributions in the context of the Resource Mobilization Strategy from the Australian Government are reported separately.

2030 AGENDA FOR SUSTAINABLE DEVELOPMENT AND THE SUSTAINABLE DEVELOPMENT GOALS

Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.

Australia is committed to the Sustainable Development Goals (SDGs) as a universal, global approach to reduce poverty, promote sustainable development and ensure the prosperity of people across the world. The Goals reflect what Australians value and seek to protect – such as a clean and safe environment, as well as the culture and heritage of Indigenous Australians and local communities.

Many of the SDGs are integrated with issues that cut across multiple aspects of sustainability and require a broad system-based approach. Where appropriate, and in partnership with others, the Australian Government takes practical and system-based approach to address these issues. Coordinating action in a federated structure adds complexity and contestability with multiple levels of governance and overlapping or separate competencies. For Australia, many targets in the SDGs are in the purview of the sub-national government jurisdictions (state, territory and local governments); enabling action by those entities can spur action through competition and benchmarking.

The Australian Government has adopted an approach to the SDGs that is appropriate for our national circumstances, with government policy responsibilities and priorities devolved to the relevant agency and level.

Australia has long recognised that ecologically-sustainable development is essential to ensure the ongoing wellbeing of the country and people.

There is a range of policies and legislation in place to address key threats to marine life, to protect iconic species and support the sustainable use of our ocean resources. Sub-national governments use integrated planning approaches for their marine areas, for the sustainable management of fisheries, aquaculture, trade and tourism, as well as land based activities that have an impact on the marine environment.

Some of the recent work undertaken is summarised below.

Submission of Australia's first Voluntary National Review on the 2030 Agenda and the SDGs

In July 2018, Australia presented its first Voluntary National Review on progress towards the 2030 Agenda and the SDGs to the High Level Political Forum on Sustainable Development. The Review showcases activity and engagement undertaken by a cross section of stakeholders in Australia to progress the SDGs. It recognises both achievements and challenges, and has been well received internationally (<https://www.sdgdata.gov.au/about/voluntary-national-review>).

Launch of the National Reporting Platform on the SDGs

The Australian Government's National Reporting Platform on the SDG Indicators was launched in July 2018. It is a whole-of-government initiative.

As at July 2019, the Platform contains national data for 118 of the 232 SDG Indicators, including data for 19 of the environment and energy Indicators. The number of indicators we have reported on is comparable to other countries that have reported on the environment and energy indicators to date.

Australia's official data on the environment and energy indicators on our National Reporting Platform shows high performance nationally in many areas. For example:

- exceeded the Target to conserve at least 10 per cent of our coastal and marine areas
- approximately 37 per cent of our marine environment is managed through marine protected areas
- a large proportion of our fish stocks are also sustainably managed.

As detailed in section II (measure 1) Australia maintains a strong protected areas network that covers a large proportion of the nation's important terrestrial and freshwater biodiversity, as well as a large proportion of forest area under long-term forest management plans.

The Platform is available at www.sdgdata.gov.au/

Integrating the SDGs into policies, strategies, programs and corporate documents

The Australian Government has integrated the SDGs into national policies, strategies and programs, as well as related agency corporate documents, including the related agency's Corporate Plans and Annual Reports for the past three years.

The SDGs are referenced in the recently revised *Australia's Strategy for Nature 2019–2030*, *National Food Waste Strategy* (2017), *National Waste Policy* (2018) and the five management plans for Australia's Marine Parks.

Australia is also working to integrate the SDGs into environmental-economic accounts, the National Landcare Program and the delivery of the National Environmental Science Program.

Stakeholder Forum on the environment and energy SDGs

The Australian Government co-hosted its first stakeholder event on the environment and energy SDGs with the Australian Committee of the International Union for Conservation of Nature (ACIUCN) in September 2017.

The Forum was held in Sydney and was a great success, with nearly 100 leaders in government, business, industry, communities, academia, Indigenous and non-government organisations in attendance.

The Forum was an opportunity to bring together a range of stakeholders for a first conversation on the environment and energy SDGs. Discussion focussed on barriers, incentives and opportunities, as well as innovation and partnership opportunities to progress action on the environment and energy SDGs (<http://www.environment.gov.au/about-us/international/2030-agenda>).

Case studies on environment and energy SDGs

The Australian Government Department of Agriculture, Water and the Environment's compendium of case studies on the work underway by government, business, industry, academia, non-government organisations and communities that gives effect to the environment and energy SDGs over the 2017-2018 period. Some of the case studies included work on Indigenous Rangers programs, waste and resource recovery infrastructure, and collaborative oceans research programs, among others. The compendium is available at <http://www.environment.gov.au/about-us/international/2030-agenda>.

Australia has also launched a stakeholder website for the SDGs, where national, sub-national and local stakeholders can upload case studies on their work on the SDGs. The website is available at <https://sdgs.org.au/>.

Case Study – The Australian Marine Debris Initiative

The Australian Marine Debris Initiative (AMDI) is led by the Tangaroa Blue Foundation, a non-government organisation. Other partners to the initiative include more than 1000 organisations, such as non-government organisations, community groups, schools, Indigenous rangers, local government authorities, state government agencies, federal government agencies, universities, industry bodies and businesses, and individual volunteers.

In its formative stage the initiative developed a system and methodology which, with community engagement, encouraged those involved in removing marine debris to take the extra step of recording what was found and contributing that information to a central database.

In 2015 the Australian Marine Debris Database received 1,400 data submissions and by the end of 2017, over 2,000 annual submissions had been received. This growth in participation has been accompanied by a broadening of the types of locations where clean-up activity and data collection are occurring, and the purpose of those activities. In addition to coastal locations, clean-up activity by AMDI partners is now providing marine debris data and information about pollution in estuaries, rivers, lakes, dry land facilities and locations, and various underwater settings. Clean-up activity is expanding from opportunistic clean-ups and basic beach monitoring activities to more specific monitoring of, for example, microplastic pollution, plastic resin pellets, single-use plastic packaging and specific commercial fishing items. As a network, AMDI participants have a growing capacity to provide early warning of spills and releases, track them, and carry out a 'coast watch' function providing information of interest to quarantine and marine safety agencies.

From the outset, source reduction was the primary reason for data collection for the AMDI. Recent growth of activity and broadening of focus in the AMDI community has increased momentum on source reduction efforts. There are three broad areas of source reduction activity, the first being community based activities including workshops and education programs. These workshops provide a template and immediate practical application of source reduction ideas by choosing a target and formulating a plan. An example of this was the banning of the release of helium-filled balloons by a local council in Western Australia, following a concerted campaign by local councillors and community members who mapped out the basic task at a Source Reduction Plan workshop.

The second area is participation in public sector forums, including advocating for legislative and regulatory change. Recent activity in this area includes submissions and appearances at Senate enquiries, a review of the *Threat Abatement Plan for the impacts of marine debris on vertebrate marine life*, and a range of consultative forums.

The third area involves working with industry to effect change in practice. A recent success in this area is the establishment of Operation Clean Sweep® to address the accidental release of plastic resin pellets into the environment by the plastics industry. An AMDI partnership gathered the data on the extent of the problem and then promoted the solution to the plastics industry in Victoria. Operation Clean Sweep® now has the potential to become a national initiative.

The Australian Marine Debris Initiative has a strong community base, a growing and diverse list of partners and an extensive national database of marine debris, covering coastal and inland waterway sites nationally. Coupled with a source reduction strategy and plans that produce results, the AMDI provides a successful working model for achieving successful outcomes in pursuit of the Sustainable Development Goals (<https://sdgs.org.au/project/australian-marine-debris-initiative/>).

V. DESCRIPTION OF THE NATIONAL CONTRIBUTION TO THE ACHIEVEMENT OF THE TARGETS OF THE GLOBAL STRATEGY FOR PLANT CONSERVATION

Does your country have national targets related to the GSPC Targets?

Yes. Details on the specific targets are detailed below:

Australia's Biodiversity Conservation Strategy

Australia's Biodiversity Conservation Strategy 2010-2030 is a guiding framework for conserving our biodiversity. The Strategy outlines three priorities for action that are underpinned by 10 interim national targets. Six of the 10 targets relate to the Global Strategy for Plant Conservation:

Target 1: By 2015, achieve a 25 per cent increase in the number of Australians and public and private organisations who participate in biodiversity conservation activities.

Target 2: By 2015, achieve a 25 per cent increase in employment and participation of Indigenous peoples in biodiversity conservation.

Target 4: By 2015, achieve a national increase of 600,000 km² of native habitat managed primarily for biodiversity conservation across terrestrial, aquatic and marine environments.

Target 5: By 2015, 1,000 km² of fragmented landscapes and aquatic systems are being restored to improve ecological connectivity.

Target 6: By 2015, four collaborative continental-scale linkages are established and managed to improve ecological connectivity.

Target 7: By 2015, reduce by at least 10 per cent the impacts of invasive species on threatened species and ecological communities in terrestrial, aquatic and marine environments.

Threatened Species Strategy

In 2015, the Threatened Species Commissioner released the *Threatened Species Strategy* as the guiding policy for the Australian Government's approach to protecting and recovering the nation's threatened plants and animals. The Strategy pursues a science-based approach in support of clear actions and conservation partnerships. The Strategy sets out five-year targets to 2020 with plant specific targets that include:

Year 1:

- Ensure at least 80 per cent of projects funded through the 20 Million Trees and Green Army Programs support the recovery of threatened plants and animals by providing suitable threatened species habitat
- Recovery actions underway for at least 20 plants
- Recovery actions underway for at least 20 threatened ecological community sites
- Priority species and communities for on-ground recovery action and seed collection identified
- Projects designed to fill gaps in collections and genetic representativeness and support on-ground recovery are identified for priority species and communities.

Year 3:

- Recovery actions underway for at least 30 plants
- Recovery actions underway for at least 40 threatened ecological community sites
- At least 50 per cent of our known threatened plant species stored in conservation seed banks.

Year 5:

- 100 per cent of our known threatened plant species stored in conservation seed banks
- Recovery actions underway for at least 50 plants
- Recovery actions underway for at least 60 threatened ecological community sites
- At least 30 priority plant species have improved trajectories.

Please provide information on any active networks for plant conservation present in your country.

Please list any plant conservation groups or botanical garden networks working on plant conservation in your country.

Australian Native Plants Society (ANPSA)

Australian Network for Plant Conservation (ANPC)

Australian Seed Bank Partnership (ASBP)

Botanic Gardens Australia and New Zealand (BGANZ)

Conservation Volunteers Australia (CVA)

Council of Heads of Australian Botanic Gardens (CHABG)

Council of Heads of Australasian Herbaria (CHAH)

Landcare Australia

Please describe the major measures taken by your country for the implementation of the Global Strategy for Plant Conservation.

Australia supports the implementation of the Global Strategy for Plant Conservation through existing mechanisms delivered by governments, botanic gardens, herbaria and plant conservation networks. These programs contribute towards the identification and protection of threatened species, including plants, as well as management of ecosystems and landscapes to ensure ongoing sustainability and diversity.

For example, the *Threatened Species Strategy*, launched in 2014 under the Threatened Species Commissioner model, seeks to halt the decline of prioritised threatened species, including 30 plant species. The Year Three Report indicated that recovery actions were underway for all 30 targeted plant species, under the *Threatened Species Strategy* with funding support from the Australian Government programs such as 20 Million Trees, Green Army and the National Landcare Program. Recovery actions are also underway at 40 sites containing threatened ecological communities and over 61 per cent of our known threatened species are stored in Australian Seed Bank Partnership seedbanks (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>).

The Australian Seed Bank Partnership (ASBP) is a national collaboration of twelve of Australia's leading botanic gardens, state environment agencies and flora-focused non-government organisations. The ASBP delivers a national program of work focussed on *ex situ* plant conservation that supports the Australian Government's priorities to protect and improve the environment. The ASBP supports policy-makers, researchers, and the environmental conservation sector, to work collaboratively to help safeguard our plant populations and ecological communities for future generations. The ASBP also collaborates with the Royal Botanic Gardens, Kew's Millennium Seed Bank Partnership, to contribute to global *ex situ* seed conservation and research. This international partnership enables the ASBP to leverage funding from the philanthropic sector to support Australia's seed banking activities, and contribute to regional collaborations with botanic gardens and plant conservation organisations to share knowledge and build capacity for conservation seed banking. The work of the ASBP is guided by the Australian Seed Bank Partnership *Business Plan 2011-2020* and is governed by The Council of Heads of Australian Botanic Gardens Inc.

Bush Blitz is the largest nature discovery program in Australia. It has been nine years since a unique partnership between the Australian Government Department of Agriculture, Water and the Environment, BHP and Earthwatch Australia began. Bush Blitz has discovered over 1,600 new species since 2010 extended the known range of over 250 species, and generated more than 500 records of species listed as threatened, vulnerable or endangered, along with over 1,200 records of pest species. The program has also recorded more than 32,000 individual occurrences of plants and animals, which can be accessed by land managers, scientists and the general public using online tools such as the Atlas of Living Australia. Since its inception, Bush Blitz has recorded 41 new plant species in Australia, including a new *Pelargonium*, confirmed as discovered in the Australian Capital Territory from a Bush Blitz in the ACT/New South Wales Alps (<http://bushblitz.org.au/bush-blitz-nsw-and-act-alps/>).

Our National Reserve System protects areas across Australia, including threatened native plants and animals. Under the *National Reserve System Strategy 2010-2030*, protection targets, which are aligned with the Convention on Biological Diversity (CBD), include core areas established for the long-term survival of threatened ecosystems and threatened species habitats in each of Australia's bioregions by 2030, and critical areas for climate change resilience, such as refugia, to act as core lands of broader whole of landscape scale approaches to biodiversity conservation by 2030. The national targets for building the National Reserve System are set collaboratively by the Australian Government with the sub-national governments. The targets are part of the strategic national approach to make measurable progress towards the establishment of a comprehensive, adequate and representative (CAR) protected area system (<https://www.environment.gov.au/land/nrs/about-nrs/requirements>).

As a continuing commitment under our National Landcare Program, the Environmental Stewardship Program provides long-term support for private landholders to maintain and improve the condition of matters of national environmental significance under the national EPBC Act. Threatened ecological communities have been targeted, with follow up monitoring indicating benefits, both for threatened species and threatened ecosystems, in protecting and buffering against threats, and in encouraging sustainable management by landholders, of these communities into the future. Protecting these ecological communities also means protecting and maintaining the health of those native plant species that comprise them (<http://www.nrm.gov.au/national/continuing-investment/environmental-stewardship>).

Australia also adheres to international obligations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Australia became a Party to CITES in 1976. We register a List of CITES Species under the EPBC Act. The List includes details of the CITES Appendix in which a species is listed, the date on which the CITES provisions first applied to the species and any conditions or restrictions that may apply to the specimen.

Managing trade in our unique biodiversity includes ensuring the sustainable harvesting of the country's native flora. For example, Western Australia developed the *Management of commercial harvesting of protected flora in Western Australia* in 2013, which was updated in 2018 (<https://www.environment.gov.au/biodiversity/wildlife-trade/publications/management-commercial-harvesting-protected-flora-wa-2013-2018>). Tasmania has prepared the *Tree Fern Management Plan for the sustainable harvesting, transporting or trading of *Dicksonia antarctica* in Tasmania 2017*, updated from a 2012 plan (<https://www.environment.gov.au/biodiversity/wildlife-trade/publications/tree-fern-mgt-plan-sustainable-harvesting-transporting-trading-tas-2017>).

Additional efforts to improve the conservation of our native flora have been made in the non-government and community sectors, with funding from government and philanthropic donors providing targeted support.

For example, in South Australia, the endangered Whibley's Wattle (*Acacia whibleyana*) is benefiting from a project where school students and landholders are helping to propagate 800 seedlings, as well as reducing threats through controlled burns and fencing. Genetic testing also indicates there is no genetic inbreeding in this species and, in fact, there are four distinct sub-populations (<https://www.naturalresources.sa.gov.au/eyrepeninsula/news/201906-Wattle-happen-with-the-endangered-Whibleyana-nws?BestBetMatch=whibley%20wattle|4d090124-f3d8-4557-9b86-0d101df97e20|46d71422-ee72-40ae-9a97-a32b00c7f5a3|en-AU>).

Another example is the Wandiyali Swainsona Project underway in New South Wales, where existing Small Purple Pea (*Swainsona recta*) plants are being intensively managed, with translocations to establish new populations within special purpose conservation fencing. Intensive and ongoing management involves non-government organisations and volunteer groups, such as Conservation Volunteers Australia, Canberra Nature Map, Queanbeyan Landcare and the Molonglo Catchment Group. These groups work in partnership with the Australian National Botanic Gardens, and in consultation with the New South Wales Government Threatened Species team (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>).

GSPC Target 1: An online flora of all known plants

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

We have taken significant steps to digitise data on Australia's known vascular flora. Approximately half of our known flora is captured online, with substantial effort over the next decade dedicated to building on the existing information. A range of information sources contribute to these efforts with case studies on specific contributing efforts provided below.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

We are committed to the development of open and freely accessible botanical and taxonomic data for use by the research sector and plant conservation community. Experts from Australia's leading botanical and research institutions collaborate closely to develop and improve open access facilities that support the realisation of this target.

The **Australian Plant Name Index (APNI)** is a comprehensive nomenclature for our native and naturalised flowering plants, conifers, ferns, mosses, hornworts and liverworts. Other cryptogams and fungi are being progressively added to the APNI infrastructure. In addition to details of initial publication and typification, APNI records secondary publication of subsequent taxonomic concepts and synonymies. In time, APNI will document all published names and classifications of the Australian Flora.

The **Australian Plant Census (APC)** is a nationally agreed view of the current taxonomic classification of the Australian flora, derived from evaluation of the published research documented in the APNI. APC family level taxonomy is concordant with the APGIII (Angiosperm Phylogeny Group) classification. A national working group of nomenclatural expert taxonomists from the national and each state herbaria, considers all available prior published work on a plant group and makes recommendations to the Council of Heads of Australasian Herbaria (CHAH), which endorses the proposed taxonomy for use at a national level. In the rare case of deadlock by the working group, CHAH makes an executive decision. Evidence for new taxonomies is considered by the working group as they are published. Work on the APC, and the underlying APNI, is ongoing. Together, they comprise the botanical component of Australia's National Species List, and are the evolving taxonomic backbone to the *Flora of Australia* and Atlas of Living Australia (ALA). They represent an Australian contribution to international projects such as the Global Biodiversity Information Facility (GBIF), the International Plant Names Index (IPNI), the World Flora Online (WFO) and the Catalogue of Life.

The Australian Government, through the **Australian Biological Resources Study (ABRS)**, in partnership with the ALA and Council of Heads of Australasian Herbaria, have greatly improved the accessibility and functionality of the *Flora of Australia*. Information from the original published volumes of the *Flora of Australia* and new family treatments are now accessible through a new digital platform, provided through the technical infrastructure of the ALA. This "profiles" platform makes use of the nomenclatural and taxonomic backbones of the National Species List (APNI and the APC), integrating descriptions, keys, illustrations, photographs and maps from other ALA applications and services such as the Australasian Virtual Herbarium and the Australian Plant Image Index. The infrastructure will provide a platform and resources for other specialist local and regional floras over the coming years.

The *Flora of Australia* holds 14,200 plant profiles, representing approximately 50 per cent of the known Australian vascular flora. Missing family, genus and species profiles will be progressively added by ABRS and the Australian botanical community over the coming decade. The Flora, with its enhanced functionality, will enable the plant conservation community to search and browse thousands of species, identify plants using interactive keys and export information for use offline. ABRS has also committed to work with the World Flora Online Consortium, to contribute *Flora of Australia* content for inclusion in their global systems, once transfer governance arrangements are in place.

GSPC Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

The assessment and listing of Australia's threatened flora at the national level is legislated under the EPBC Act. In order to determine if a species is eligible for listing as threatened in one of the categories under the EPBC Act, a rigorous scientific assessment of the species' threat status is undertaken. These assessments are undertaken by the Threatened Species Scientific Committee (TSSC) to determine if the item is eligible for listing against a set of criteria, as set out in the guidelines for nominating and assessing threatened species and ecological communities.

The TSSC is an independent committee of eminent conservation scientists that provides the Australian Government Minister for the Environment with advice on matters relating to listing, conservation and recovery of threatened species and ecological communities, and listing and abatement of key threatening processes.

An invitation to nominate is extended by the Minister each year, ahead of a new assessment cycle. Nominations received during the invitation period are considered by the TSSC for inclusion in a proposed priority assessment list. Nominations included on the finalised priority assessment list are assessed by the Committee, which makes these nominations available for public and expert comment. After assessment, the Committee's advice is forwarded to the Minister, who must decide whether a species is eligible for listing under the EPBC Act within 90 business days of receiving the advice of the TSSC.

The rigour with which assessments are conducted under the EPBC Act means that we will not achieve an assessment of all known plant species at the national level by 2020.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

There are currently 1355 species of Australian flora listed at the national level under the EPBC Act.

There are currently 755 species of Australian flora listed on the IUCN Red List of Threatened Species, 40 of which are also listed under the EPBC Act.

Case Study: Common Assessment Method

The Australian national and sub-national governments have different legislative frameworks for the assessment and listing of threatened species, which has resulted in nine separate jurisdictional lists across Australia. The species on these lists often overlap, although many have been assessed and listed using different criteria, threat categories and scales of assessment. These inconsistencies and the resulting misalignment of lists has led to confusion about the status of listed species.

The primary aim of the Common Assessment Method is to reduce this confusion and duplication of effort by establishing a consistent method for the assessment and listing of nationally threatened species across Australia. Using the Common Assessment Method, participating jurisdictions will work together to ensure that species are assessed and, where warranted, listed in only one 'nationally threatened' category, which is reflected on each of the relevant jurisdictional lists.

The Common Assessment Method uses consistent categories and criteria, based on the best practice standard developed by the International Union for the Conservation of Nature (IUCN) Red List, as well as the Conservation Dependent category for fish. It is applied at the 'national scale', meaning that all occurrences of a species within Australia are considered in the assessment. One jurisdiction will take the lead on an assessment, with other relevant jurisdictions participating in the process and adopting the final assessment outcome to achieve list alignment.

The Common Assessment Method is underpinned by an intergovernmental Memorandum of Understanding. Implementation is coordinated by an inter-jurisdictional Working Group, and participating jurisdictions are pursuing administrative arrangements and legislative amendments to give effect to the agreement in their

jurisdiction. Between 2015 and the end of 2018, 68 listing decisions have been made under the EPBC Act, based on assessments undertaken by state or territory governments using the Common Assessment Method.

GSPC Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

In 2015, the Australian Government released its Public Data Policy Statement which formalises the Government's commitment to open data. Data held by the Australian Government, including environmental data, is a strategic national resource that holds considerable value for growing the economy, improving service delivery and transforming policy outcomes for the country. The Statement commits to optimise the use and reuse of public data; to release non-sensitive data as open by default; and to collaborate with the private and research sectors to extend the value of public data for the benefit of the Australian public.

Continuous improvement of Australia's information tools and reporting mechanisms, and their digital transformation and integration, is driving the emergence of a powerful new network for biodiversity information that is key to the improvements required for better reporting on biodiversity. The Australian Government recently announced an initiative to commence digital transformation of the environmental assessment process and one component of this is to develop a national approach to the collection of biodiversity data contributed by proponents. This data will be collected in a more consistent manner, stored where it can be found and available for reuse.

The Australian Biological Resources Study (ABRS) compiles, curates and makes openly accessible authoritative databases and information resources describing the biodiversity of Australia. ABRS works closely with Biodiversity Science teams in Parks Australia, including the Centre for Australian National Biodiversity Research (Australian National Herbarium), the Bush Blitz Program, the National Seed Bank and the Biodiversity Informatics team, and in partnerships and collaborations with the Commonwealth Scientific and Industrial Research Organisation (CSIRO), museums, herbaria, universities and the Atlas of Living Australia. This includes development, management and maintenance of fundamental national science data and information resources such as the Flora of Australia, Australian Faunal Directory and National Species List (see below).

Through their seed collecting and research activities, the Australian Seed Bank Partnership (ASBP) partners have captured large quantities of data on phenology (the leaf, flower and fruiting periods), ecology, abundance, seed morphology, germination/dormancy requirements and storage characteristics. The ASBP, in collaboration with the Atlas of Living Australia, has built an accessible online seed information resource, The Australian Seed Bank online (see below). This virtual seed bank is providing a resource for researchers, students, restoration and conservation practitioners and community groups, as well as the horticultural and nursery industry, in identifying and sourcing seed for research and restoration of Australia's diverse landscapes. The ASBP and the Atlas of Living Australia continue to work together to improve data accessibility to support the conservation of genetic resources from Australia's native plants.

Australia reports on the state of the environment once every five years and provides a comprehensive national assessment of the state of the environment of the country. Written by independent experts, it is an analysis of the best available evidence to provide a clear picture of what is going well and what requires more effort. *Australia State of the Environment 2016* is presented in an online interactive format for the first time, allowing users to explore different sections of the report according to headline issues, drivers of environmental changes, different themes and topics, as well as through status and trends, effectiveness of management, resilience and risks, and the outlook onto the future. Presentation of the data in this manner enables accessibility to a broader range of interested parties, allowing for an in depth consideration or a quick scan of key issues for consideration (<https://soe.environment.gov.au/>).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

Case Study: Australasian Virtual Herbarium (AVH) - Sharing Information

In Australia, national and sub-national herbaria hold more than seven million database records of plants and fungi from throughout Australia and its region. These records comprise an invaluable resource for the community, research scientists and government. They provide core and vital information on what grows where, how common or rare the plants are, and how their distributions have changed and are changing over time.

Previously, these records were only available to a few scientists, and only after laborious work searching through the catalogues at individual herbaria. With the advent of the **Australasian Virtual Herbarium (AVH)**, all of these valuable records are now freely available to enthusiastic amateurs, research scientists and government agencies over the internet, along with sophisticated discovery, visualisation and analysis tools.

The Australasian Virtual Herbarium (AVH) is built on the national technical information infrastructure of the Atlas of Living Australia (ALA) and has recently been extended to include the herbarium collections of New Zealand. This shared infrastructure enables sharing of plant data, applications and services between plant-related and general biodiversity projects.

Case Study: National Species List

The Australian Government, through the Australian Biological Resources Study, partners with the Atlas of Living Australia and Australian herbaria to maintain a dynamically updated, online list of the plants of Australia, including mosses, lichens, liverworts and hornworts, algae and fungi. The National Species Lists is a linked open data system that draws on the Australian Plant Name Index (comprehensive nomenclature for Australian plants) and the Australian Plant Census (agreed checklist and the accepted taxonomy for Australian plants), to present curated and current data from the Australian scientific community, which is governed by the Council of Heads of Australasian Herbaria.

Case Study: Australian Seed Bank online

Through their seed collecting and research activities, the partners of the Australian Seed Bank Partnership (ASBP) have captured large quantities of data on phenology (the leaf, flower and fruiting periods), ecology, abundance, seed morphology, germination/dormancy requirements and storage characteristics. The ASBP, in collaboration with the Atlas of Living Australia, has built an accessible online seed information resource – The Australian Seed Bank online.

This virtual seed bank is providing a resource for researchers, students, restoration and conservation practitioners and community groups, as well as the horticultural and nursery industry, in identifying and sourcing seed for research and restoration of our diverse landscapes. The ASBP and the Atlas of Living Australia continue to work together to improve data accessibility to support the conservation of genetic resources from our native plants. Partners of the ASBP also maintain seed bank specific online resources relating to the collections held by their state and territory institutions.

Case Study: National Environmental Science Program

The National Environmental Science Program (NESP) is a long-term commitment by the Australian Government to environment and climate research. NESP projects deliver collaborative, practical and applied research to inform decision-making and on-ground action. Indigenous research partnerships are a highly valued program activity. NESP recognises there is much to learn from Indigenous knowledge and peoples. NESP funding of \$145 million over the six years from 2014-2015 to 2020-2021 supports six themed research hubs, along with projects to address emerging environmental research needs. The NESP program builds on the predecessor programs, the National Environmental Research Program (NERP) and the Commonwealth Environmental Research Facilities (CERF), which commenced in 2005. The NESP hubs connect scientists, policy makers, industry, Indigenous peoples and communities to deliver research that has applicability to plant conservation in the terrestrial, marine and freshwater environments. Outputs from NESP research are made available online through hub websites and social media. For more information about the six NESP research hubs refer to sections II and <https://www.environment.gov.au/science/nesp>.

Case Study: Environmental Resources Information Network

The Environmental Resources Information Network (ERIN) aims to strengthen the environmental information evidence-base accessible to the Australian Government Department of Agriculture, Water and the Environment and its stakeholders, bringing together departmental priorities for environmental information and research, and adding value to high priority activities by providing environmental and spatial information products, advice, analysis and tools.

ERIN's role is to:

- strengthen evidence-based analytical capability - ensuring evidence is available and interpreted to inform policy development, program delivery and outcome evaluation
- strengthen delivery of high quality information and reporting about the state of the environment and pressures on it, including headline environmental indicators to improve visibility of trends in the environment, to inform decision-making at local-to-national scales
- assist in directing investment in research, data and information acquisition, to address priorities and gaps, and lead open access information reforms.

Case Study: National Open Data Sets

The Australian Government Department of Agriculture, Water and the Environment make available a range of open data sets and web services based on the latest environmental data. Every two years, the Australian Government collects information on protected areas from national and sub-national government conservation agencies and other protected area managers. This information is published in the Collaborative Australian Protected Area Database (CAPAD) and is used to provide a national perspective of the conservation of biodiversity in protected areas. It also supports regular reporting on the status of protected areas to meet international obligations, such as those in the CBD. Also included in these open data sets is the National Vegetation Information System (NVIS). NVIS information is supplied by sub-national data custodians and compiled to enable an Australia-wide analysis of the major vegetation groups and major vegetation sub-groups.

The full set of environmental data sets made available using open (Creative Commons) licencing conditions is available from the Department of Agriculture, Water and the Environment website at <http://www.environment.gov.au/about-us/environmental-information-data/open-data>.

Case Study: Groundwater Dependent Ecosystems Atlas

The Australian Government Bureau of Meteorology maintains the Groundwater Dependent Ecosystems Atlas (GDE Atlas) which was developed as a national dataset of Australian GDEs to inform groundwater planning and management. It is the first and only national inventory of GDEs in Australia and is freely available online so that better informed decisions can be made to manage vital groundwater-dependent resources. <http://www.bom.gov.au/water/groundwater/gde/index.shtml>.

GSPC Target 4: At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

As detailed in section I, *Australia's Biodiversity Conservation Strategy 2010–2030* prioritises protecting diversity by ensuring that representatives of terrestrial, aquatic and marine ecosystems, and their component species and genes, are conserved into the future. The Strategy has focused on facilitating outcomes that result in an increase in the number, extent and condition of ecosystems protected under secure conservation status, as well as an increase in private land managed for biodiversity conservation, and a net national increase in the

extent and condition of native habitat across tenures

(<http://www.environment.gov.au/biodiversity/publications/australias-biodiversity-conservation-strategy>).

In 2014, our reserve system covered 1.27 million square kilometres or 16.52 per cent of our terrestrial areas and inland waters. In 2018, this has grown to over 1.5 million square kilometres. Made up of national and sub-national reserves, Indigenous lands, protected areas run by non-profit conservation organisations, and ecosystems protected by farmers on their own private properties, over 19 per cent of our terrestrial areas and inland waters are now being conserved as examples of the natural landscape and habitat for native plants and animals.

The National Reserve System (NRS) is a mosaic of multi-jurisdictional, multi-tenure areas under government, Indigenous or private management. The NRS seeks to reserve comprehensive, adequate and representative areas of land within the country's 89 bioregions. Priority is given to increasing the protected areas that are under-represented in bioregions (i.e. less than 10 per cent protected). For example, 30 per cent of endangered communities and 50 per cent of critically endangered communities have less than 5 per cent of their extent represented. Despite this, nearly 30 per cent of terrestrial endangered communities have more than 50 per cent of their extent represented in the National Reserve System (<https://soe.environment.gov.au/theme/overview/land/topic/overview-state-and-trends-land>).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

For additional information on Australia's National Reserve System, and other programs to protect ecosystems, please see section II measure 1, section IV, Aichi target 11, protected areas, and Aichi target 15, ecosystem resilience.

Interim Biogeographic Regionalisation of Australia (IBRA)

As indicated above, Australia has exceeded CBD's Aichi target relating to protected areas with over 19 per cent of the continent protected as part of the National Reserve System. The National Reserve System gives priority to under-represented bioregions that have less than 10 per cent of their remaining area protected in reserves. Priority is also given to key habitats for nationally listed threatened species and whole-of-landscape conservation outcomes, such as places that offer refuge and/or contribute to connectivity and the adaptation of biodiversity to a changing climate. The national and regional planning framework for the systematic development of a comprehensive, adequate and representative 'CAR' National Reserve System is provided by the Interim Biogeographic Regionalisation for Australia (IBRA).

The Interim Biogeographic Regionalisation for Australia (IBRA) represents a landscape based approach to classifying the land surface of Australia. The latest version, IBRA Version 7.0, classifies our landscapes into 89 large geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The 89 bioregions are further refined to form 419 subregions, which are more localised and homogenous geomorphological units in each bioregion. The bioregions and subregions reflect a unifying set of major environmental influences which shape the occurrence of flora and fauna, and their interaction with the physical environment across Australia and its external territories (excluding Antarctica).

IBRA Version 7.0 is the result of significant changes to certain IBRA 6.1 boundaries, plus refinement of other boundaries owing to better data availability amongst some sub-national governments, and alterations by sub-national governments along state borders. The updated boundaries were jointly defined by the Commonwealth, state and territory nature and conservation agencies. In this respect, refinements were carried out to all mainland jurisdictions, with significant changes in Queensland and South Australia. In addition, the dataset was also updated to more closely conform to the Geoscience Australia 1:100K state borders and a standard coding/naming convention was introduced (for both regions and sub-regions), resulting in differences to both names and codes used in earlier IBRA Versions.

IBRA Version 7.0 includes four new oceanic bioregions: the Indian Tropical Islands Bioregion, the Pacific Subtropical Islands Bioregion, the Subantarctic Islands Bioregion and the Coral Sea Bioregion. These bioregions account for Australia's island territories, including Christmas Island in the Indian Ocean, Macquarie Island in the Southern Ocean, Lord Howe Island in the Pacific Ocean and the Coral Sea Islands Territory. IBRA7 also includes seven new subregions in the oceanic bioregions and six new subregions in

South Australia. The coast and near shore island boundaries have been adopted from the Geoscience Australia 1:100,000 coast and islands data. This has created consistent mapping of the coast and islands around Australia.

GSPC Target 5: At least 75 per cent of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

Biodiversity hotspots are areas that support natural ecosystems that are largely intact and where native species and communities associated with these ecosystems are well represented. They are also areas with a high diversity of locally endemic species, which are species that are not found or are rarely found outside the hotspot. Australia identified 15 biodiversity hotspots in 2003, areas across Australia that have a high level of endemism and also subject to particular pressures which threaten the persistence of that biodiversity (<https://www.environment.gov.au/biodiversity/conservation/hotspots>).

Southwest Australia has a number of areas identified as national biodiversity hotspots and is also recognised as an international biodiversity hotspot. The unique biogeographic region of Southwest Australia, stretching from Shark Bay in the north to Israelite Bay in the south, covers over 300,000 square kilometres. The forest, woodlands, shrublands and heath are characterised by high endemism—it is home to an estimated 8379 plant species, 47 per cent being endemic. These include the majestic marri and karri eucalypt trees that can grow to over 30 and 70 metres, respectively.

The Central and Eastern Avon Wheatbelt hotspot, in Western Australia, is particularly known for its dominant vegetation, which includes woodlands of Wandoo, York Gum, Salmon Gum, Casuarina and areas of mallee and proteaceous scrub heaths. The woodlands contain many of Western Australia's threatened plants and birds. The area is particularly rich in endemic plants, such as those from the *Grevillea*, *Hakea*, *Eucalypt*, *Acacia* and *Eriostemon* genera and the *Asteracea* family.

The Mount Lesueur-Eneabba hotspot, to the north, supports a large number of distinct, species-rich and endemic communities. There are more than 250 Indigenous plant species, many found in the heaths and scrub-heaths.

To the south, in the Busselton to Augusta area, the heathlands and shrublands of the coastal plains support hundreds of different plants per square kilometre - many of them endemic and endangered - and a wide range of native invertebrates. Forests and woodlands with high rainfall are also habitat for another highly diverse range of plants and animals.

In Western Australia, the North Kimberley hotspot has a variety of rare features, including mound springs, swamp rainforests and the Airfield Swamp, a large wetland with a paperbark forest.

Other biodiversity hotspots include the Einasleigh and Desert Uplands. In this region of North Queensland, the high ranges and plateaus of Einasleigh contrast sharply with the plains and low ranges of the Desert Uplands. Einasleigh basalt lava flows and lava tunnels provide habitat for threatened and geographically restricted plants and animals. Water enters the Great Artesian Basin aquifers here and important artesian spring complexes contain endemic plants, snails and fish including the Edgbaston Goby and the plant Salt Pipewort (*Eriocaulon carsonii*). Ecologically and geologically important wetlands include Lake Buchanan and Lake Galilee. In the Desert Uplands alone there are 22 rare or threatened animals, including the Masked Owl and the Julia Creek Dunnart, and 29 rare or threatened plants.

The Border Ranges, North and South. This sub-tropical and temperate hotspot is one of our most diverse areas - and it is *the* most biologically diverse area in New South Wales and southern Queensland. It has a variety of significant habitats: subtropical rainforest, wet sclerophyll forest, mountain headlands, rocky outcrops and transition zones between forests.

These are just some of the 15 biodiversity hotspots found in Australia, where efforts continue to protect unique ecosystems, including endemic flora and fauna found nowhere else. National programs, such as the National Landcare Program, also contribute to revegetation and restoration efforts in areas under pressure from a range of threats, including invasive species and clearing. Protection of flora also occurs at the state level, such as the Conservator of Flora and Fauna in the Australian Capital Territory (https://www.environment.act.gov.au/cpr/conservator_of_flora_and_fauna), the protected flora controls under the *Flora and Fauna Guarantee Act 1988* in Victoria (<https://www.environment.vic.gov.au/conserving-threatened-species/flora-and-fauna-guarantee-act-1988/protected-flora-controls>), and through establishing flora reserves in New South Wales (<https://www.nationalparks.nsw.gov.au/conservation-and-heritage/flora-reserves>).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

We have made significant progress in increasing the extent of our National Reserve System since 2011. At the end of 2014, the National Reserve System covered 137.5 million hectares, or 17.9 per cent of our land area, compared with 13.4 per cent in 2011. This includes contributions from the Caring for our Country Program, which expanded the National Reserve System by more than 27 million hectares (Review of the National Landcare Program, 2017). In 2018, the total terrestrial protected area increased to more than 19 per cent of Australia's land area. Some of these protected areas overlap with Australia's biodiversity hotspots (<https://www.environment.gov.au/land/nrs/science/maps-and-data>).

However, despite this growth, only minor progress has been made since 2011 in meeting representation targets for ecosystems and threatened species. In part, this is because most growth has been in desert bioregions, so that representation improvements have been highly localised. As indicated above in target 4, nearly 30 per cent of terrestrial endangered communities have more than 50 per cent of their extent represented in the National Reserve System. However, 30 per cent of endangered communities and 50 per cent of critically endangered communities have less than 5 per cent of their extent represented (<https://soe.environment.gov.au/theme/overview/land/topic/overview-state-and-trends-land>).

GSPC Target 6: At least 75 per cent of production lands in each sector managed sustainably, consistent with the conservation of plant diversity

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

The sophistication of agricultural land management in Australia continues to increase. This is seen in ongoing reductions in the intensity of agricultural chemical use in the cotton industry, due largely to the adoption of genetically modified cotton; more careful use of fertilisers in sensitive environments (e.g. catchments of the Great Barrier Reef); and more flexible approaches to grazing management to reduce erosion and increase productivity. The stewardship role of farmers and the part that they play in conserving their land are increasingly recognised.

Horticultural production supply, quality and profitability are threatened by introduced and native pests, diseases and weeds. Integrated pest and disease management uses a number of different integrated methods, rather than relying on a single approach. This is advantageous when managing native animals (e.g. parrots, fruit bats) as pests, and for insect pests and diseases.

Integrated pest management practices aim to integrate all available pest control techniques to produce healthy crops with the least possible disruption to the agro-ecosystem, rather than relying on routine applications of pesticides. First proposed in the 1970s, these practices are becoming more widely adopted in the agricultural sector.

Native vegetation remnants host a higher density of predatory insects and spiders than crops; crops usually host higher densities of pests (immature and mature) than native vegetation. Remnant vegetation also provides parasite habitat, which contributes to pest suppression in crops. Known as biocontrol, the reliability of these natural defenses increases as the availability of remnant vegetation increases. Management and improvement of remnant vegetation can increase the predator to prey (pest) ratio, which can improve pest control in grain and cotton crops. Retention and management of remnant native vegetation can also maintain populations of native bees (agricultural crop pollinators), which are more abundant and diverse in agricultural landscapes with more remnant native vegetation (especially riparian vegetation) than in those with less native vegetation (<https://soe.environment.gov.au/theme/land/topic/2016/land-use-and-management>).

Australia's management and conservation of forests is underpinned by the National Forest Policy Statement 1992 (NFPS), which was jointly developed by the Commonwealth, state and territory governments, and was written mindful that it immediately preceded adoption of the CBD, and would be a key element of the application of CBD considerations to forest management. The role of the Commonwealth Government in management and conservation of forests through the NFPS is to coordinate a national approach to environmental and industry-development issues; state and territory governments have constitutional responsibility for forest land management. The NFPS sets out broad national goals to be pursued at regional levels, and uses a framework that integrates environmental, social and economic objectives to ensure that Australia obtains a balanced return from all forest uses (<http://www.agriculture.gov.au/forestry/policies/forest-policy-statement>).

Development and extension of regional forest agreements is ensuring that our forests continue to be managed sustainably, including protections for threatened species and their habitat, where species rely upon forests for all or part of their life cycle. Protection areas are set aside from harvesting, such as flora reserves and buffer zones for old growth forest and riparian areas (<http://www.agriculture.gov.au/forestry/policies/rfa>).

Australia is involved in the Seagrass Restoration Network (SRN) Australasia, which links scientists, industry practitioners, community and government policy makers to consider the development and implementation of conservation, recovery and restoration of seagrass meadows. Seagrass meadows are important carbon stores, but also provide essential habitat for important fisheries. Projects are underway in Australia and New Zealand to restore seagrass and provide fish habitat (<https://seagrassrestoration.net/#home-1-section>).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

In addition to the information provided for this target, please see section IV, Aichi target 7, sustainable agriculture, aquaculture and forestry.

Case study – Environmental Stewardship Program

Some of the most important habitat for threatened species exists on farms and other private land. The Australian Government's Environmental Stewardship Program provides long-term support for private landholders to conduct management activities to protect and enhance the condition of five threatened ecological communities: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland; Weeping Myall Woodlands; Natural Grasslands on Basalt and Fine-textured Alluvial Plains of Northern New South Wales and Southern Queensland; Peppermint Box Grassy Woodland of South Australia; and Iron-grass Natural Temperate Grassland of South Australia. Activities include grazing management, weed and pest animal control, and maintenance of buffer zones.

Prior to 2014, the Environmental Stewardship Program operated under the Caring for Our Country banner. The Environmental Stewardship Program is now a continuing commitment under the National Landcare Program, with 288 grants totalling \$141 million over 19 years from 2008–09 to 2026–27. The objective of the Program is “to maintain and improve the condition and extent of targeted high public value environmental assets on private land”. It was also designed to secure enduring changes in land manager attitudes towards environmental protection and sustainable land management practices. The program designed consistent, simple, cost-effective and efficient interventions that could be undertaken by private land managers and farmers over the course of fifteen-years, to maintain and improve the condition of target threatened ecological communities.

The Environmental Stewardship Program used reverse auctions, which provided efficiencies and ability to deliver value for money. Over 52,000 hectares of the five threatened ecological communities across New South Wales, Queensland and South Australia are being managed, with an average management cost per hectare per year of \$231.

An ecological monitoring program being managed by the Australian National University has found that the Program has been successful in both maintaining and improving the condition of project sites. Evidence shows that some landholders have improved economic returns (additional to opportunity cost payments made under the program), because their productivity has improved, whilst their farm inputs have reduced.

As an example, with funding from the Environmental Stewardship Program, landowners near Yass in New South Wales have been able to implement land management practices that have promoted regeneration of native vegetation, as well as increasing the number of birds and native insects on their property. Active stewardship of this property is helping to control alien invasive plants, such as serrated tussock, Paterson's curse, scotch thistle and skeleton weed. In its first year, the project removed stock from the project site in order to encourage regeneration of native grasses and flowers, as well as improve soil health. Some of the flowers had not previously been observed on site. Strategic grazing in later years, and the active control of biomass, has helped these native plants to expand their range, resulting in good ground cover and eucalypt growth across the site, with a predominance of native grasses. Fencing to protect eucalypt regeneration areas from the impacts of grazing, and a couple of good seasons in succession has encouraged the recovery of mature eucalypts (Report on the Review of the National Landcare Program, 2017).

GSPC Target 7: At least 75 per cent of known threatened plant species conserved in situ

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

Many of Australia's national programs, such as the National Landcare Program, 20 Million Trees and Green Army, have resulted in on-ground work to protect threatened plants and their habitat, as well as ecological communities. Under the *Threatened Species Strategy*, projects are underway that target threatened plants, such as reinstating and improving fencing for four out of five known sub-populations of the Shy Susan (*Tetratheca gunnii*) in Tasmania, to reduce the impacts of native browsers and protecting the endangered Silver Gum (*Eucalyptus crenulata*) in the Buxton Silver Gums Reserve in Victoria, and establishing a seed orchard at a secure location away from the threat of cross pollination with other eucalypts (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>).

As a result of the *Threatened Species Prospectus*, partnerships between government and non-government organisations, including volunteer groups, are undertaking work to protect species such as the Purple Wattle (*Acacia purpureopetala*), Morrisby's Gum (*Eucalyptus morrisbyi*), one of our most endangered eucalypts, and some of South-west Western Australia's most endangered species, Matchstick Banksia (*Banksia cuneata*), Black Grevillea (*Grevillea calliantha*), Scaly-leaved Featherflower (*Verticordia spicata* subsp. *squamosa*) and the Glossy-leaved Hammer-orchid.

Many programs to protect habitat and threatened species have tended to focus on iconic animals and birds, rather than plants. However, a significant effort has been made to secure seed from native species across the continent. The collection of seed through the Australian Seed Bank Partnership has largely been driven through collaboration with the Millennium Seed Bank Partnership, a global initiative to bank the world's native species. Many other collections are being made by practitioners throughout Australia for both short-term and long-term *ex situ* conservation. These efforts support the persistence of our most threatened flora by helping to secure collections of seed used in research and on-ground restoration and translocation projects, to establish new populations as an insurance against future species loss.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

Statistics on threatened plant species in Australia's protected areas

A total of 699 nationally listed species are known to occur in at least one or more of our protected areas, representing 53 per cent of the known threatened plant species at the national level. A further 510 nationally listed species are likely to occur in at least one or more of our protected areas, representing 39 per cent of the known threatened plant species at the national level. A total of 233 species have more than 50 per cent of their known distribution included in protected areas, with 67 species having 100 per cent of their known distribution included. Ninety-two per cent of our nationally listed threatened plant species are known or likely to occur in one or more of our existing or interim protected areas (data is current as at 8 August 2018).

To be included in our National Reserve System (NRS), an area must meet the standards identified in *Australia's National Reserve System Strategy 2009–2030*. The lands included in the above assessment are those lands that have already been assessed as meeting the standard and have been formerly declared as a protected area. Also included are those lands that have been assessed as meeting the standard for inclusion in the NRS, but have not yet been formally established as a protected area. However, these lands do have binding agreements in place for formal protection to occur in the future and therefore hold 'interim' NRS status.

The data that underpins our ability to make these inferences is curated by the Environmental Resources Information Network (ERIN). ERIN's spatial ecologists map the predicted distribution of listed species using ecological data and research information readily available to the Australian Government Department of Agriculture, Water and the Environment. An extensive database of species observation records and national-scale environment data, as well as modelling software, such as Maxent, is used to develop maps of predicted distribution, which includes areas of potential habitat. These maps are indicative, rather than definitive, and constitute a starting point for further investigation, rather than a comprehensive scientific assessment.

Where sufficient information exists, these distribution maps provide an indication of biological importance and the spatial certainty of the information, by subdividing the distribution into a number of classes including 'Known to occur' and 'Likely to occur'. For species that are categorised as 'known to occur', generally it is an area identified as suitable or preferred habitat, inside or close to known locations. Considerations include an understanding of the ecology of the species, habitat preferences, the age and precision of the observations, and whether data exists to reflect these preferences. In the absence of specific ecological elements, such as range or dispersal distances, distance buffers from known locations are used as an alternative identification method for this occurrence class. For species that are 'likely to occur', areas are identified as suitable or preferred habitat, within ecologically sensible distances from known locations. Care is given not to extrapolate at too great a distance from the occurrence range of known records. A conservative threshold chosen from a species modelling tool (e.g. Maxent) may be used where appropriate and the use of buffers is avoided, where possible.

GSPC Target 8: At least 75 per cent of threatened plant species in *ex situ* collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

On track to achieve target at national level

The Council of Heads of Australian Botanic Gardens Inc. established the Australian Seed Bank Partnership in 2011 as Australia's largest seed conservation collaboration. The Australian Seed Bank Partnership makes significant contributions to the realisation of specific targets for seed conservation identified in Australia's *Threatened Species Strategy* and towards the realisation of Targets 8 and 9 of the Global Strategy for Plant Conservation.

Through the Australian Seed Bank Partnership's *Business Plan 2011–2020*, the 1000 Species Project is targeting collecting efforts to secure 1000 of our endangered, endemic and economically significant species for long term *ex situ* conservation and research. The project's second phase will focus on securing multiple collections that increase the genetic representation of the target species across their range. Significant progress is being made towards achieving Target 8 of the GSPC, however, the target has not yet been fully achieved. On-going collaborations across our seed banks and botanic gardens will continue to contribute to this target.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

At the end of June 2018, there were 20,296 collections stored in ASBP seed banks throughout Australia. Over 13,336 of these collections are considered to be unique accessions, with the remaining 6960 representing duplicate collections secured across the represented species range, bolstering the genetic diversity of collections held throughout Australia. A total of 903, or 66.8 per cent, of our nationally listed threatened flora species are currently represented in Australia's *ex situ* conservation seed banks, with many of these having already been accessed to support recovery and restoration programs.

There are currently 1355 species of Australian flora listed under the EPBC Act.

Case Study: Assessing the representativeness of threatened plant species in ex situ collections

The Australian National Botanic Gardens (ANBG) maintains the largest scientifically documented collection of Australian native plants that originate from plants sourced from the wild, accompanied by herbarium specimens for taxonomic study. In order to better assess the coverage of threatened plant species held *ex situ*, the ANBG developed a new methodology to assess its living collection. The methodology will also help inform decisions about future collection of target species, as well as working with partners for recovery or restoration. This methodology is a model for documenting and assessing the national comprehensiveness and adequacy of Australia's *ex situ* collections.

Using plant records for each threatened species, the methodology compares the number of individual plants growing in the garden, held in the seedbank or under cultivation in the nursery; the number of genotypes that the living collection holds; and the number of known wild origins of the species. Each species is mapped with its known wild geographic distribution, against the provenance of the plants in the living collection, providing information for a rapid assessment, or proxy, for genetic diversity.

The methodology highlights the value of accuracy and currency of plant records. It also highlights the potential value of local and regional collaborations to coordinate efforts to collect well-represented species for recovery and restoration.

Case Study: Australian Seed Bank Partnership

The Australian Seed Bank Partnership (the Partnership) is a national collaboration of twelve of Australia's leading botanic gardens, state environment agencies and flora-focused non-government organisations. The Partnership delivers a national program of work focussed on *ex situ* plant conservation that supports the Australian Government's priorities to protect and improve the environment. The Partnership supports policy-makers, researchers, and the conservation and restoration sectors, to work collaboratively to help safeguard our plant populations and ecological communities for future generations.

The *ex situ* conservation work being undertaken by Australia's conservation seed banks presents an important opportunity to improve the results of *in situ* conservation, through refining germination and cultivation protocols; identifying appropriate storage techniques for native seeds, to ensure higher rates of success in re-introduction programmes; and advance the effective conservation of target species and plant communities. The Partnership is working to increase direct efforts in provenance-focussed native seed collecting, to increase genetic representation in *ex situ* collections, and support long-term conservation and restoration activities. Australia's conservation seed banks currently hold collections of more than 13,300 plant species, with the Western Australian Seed Centre seed bank holding 79 per cent of the State's listed threatened plant species.

The Partnership works collaboratively to target resources, build a comprehensive *ex situ* conservation collection of Australian plants, and deliver research to improve the available knowledge of seed biology,

germination and seed storage requirements. The Partnership has initiated strategies for sharing this knowledge, guiding conservation and restoration practices for maintaining and re-establishing ecosystem function, and building resilience throughout the Australian landscape. The work of the Partnership also provides an insurance policy against the loss of plant diversity, including the provision of potential benefits from wild plant diversity and its sustainable utilisation. This wealth of genetic material is critical to understanding the drivers of plant evolution and the impacts of threats, such as climate change and disease. The continued collection, storage and associated research into Australia's flora is important for the long-term conservation of our native plant species.

GSPC Target 9: 70 per cent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated Indigenous and local knowledge

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

In 2014, the Australian Grains Genebank (AGG) and the Australian Seed Bank Partnership (ASBP) developed a business case, including a fully costed model for the strategic collection of crop wild relatives (CWR) from Australia. This was developed in direct response to the Global CWR Gap Analysis that was published in early 2014. Following the development of the business case, AGG and ASBP mapped the known collection localities for the 20 high priority species identified through the gap analysis, and have developed proposals for the targeted collection of these species, subject to the availability of funding. The AGG successfully negotiated dedicated funding in 2017 to collect a minimum of 20 accessions per annum. In 2018, the ASBP, in partnership with the AGG, were awarded funding from the Royal Botanic Gardens, Kew's Millennium Seed Bank Partnership, the Crop Trust and the Simon Foundation, to conduct capacity building and CWR collecting in Australia. This project secured 36 collections of 26 taxa from Kakadu National Park in northern Australia, with one species, *Sorghum grande*, having never before been accessioned in the genebank system globally.

An annual collecting mission will be undertaken across Australia by AGG, in partnership with ASBP and other organisations, where possible, to conserve more material. Some CWR species across northern Australia are under threat from urbanisation, expansion of infrastructure such as dams, and potentially from competition from introduced crops, ornamental varieties and weed species. To safeguard CWR from these threats, all collections made by the AGG are conserved under long-term conditions in the AGG and safely duplicated in at least one other Australian seed bank, as well as in the Svalbard Global Seed Vault in Norway.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

Australia is a Party to the International Treaty on Plant Genetic Resources for Food and Agriculture and implements Treaty obligations through existing laws, regulations, policies and programs, including through agriculture sector strategies—for example, the *Grains Industry National Research, Development and Extension Strategy*.

National and sub-national legislation and regulation governing access to genetic resources

Australia has two national genebanks, the Australia Grains Genebank and the Australia Pastures Genebank, along with many other *in situ* and *ex situ* plant genetic resources collections. These genebanks assist in storing a range of seeds for a wide collection of species, as well as distributing seeds to other countries to assist with research and breeding.

The Australian Grains Genebank

The Australian Grains Genebank (AGG) maintains accessions of crop species, their progenitors and wild relatives under long-term conservation conditions. The stored germplasm is monitored for viability and seed

is regenerated as required, based on seed viability decline and the volume of seed available. The AGG curates comprehensive passport data associated with each germplasm collection, such as taxonomic information, germplasm donor source, original country of origin, and level of development, such as cultivar, breeding material, landrace, wild relative and known attributes, including trait-based information. Traditional and/or local knowledge, and the known traditional uses of stored germplasm, is recorded for a small subset of material, however, the detail associated with these collections is limited. All germplasm held at the AGG is managed and distributed under the terms and conditions of the Standard Material Transfer Agreement (SMTA) of the International Treaty for Plant Genetic Resources for Food and Agriculture. Where pre-existing Material Transfer Agreements or Benefit Sharing Agreements are in place, these have precedence over the SMTA.

The AGG currently holds almost 195,000 accessions of temperate and tropical grain crops, their progenitors, landraces, breeding material and wild relatives. These collections are represented by 152 genera of 918 species, sourced from more than 150 countries. Crop wild relatives comprise 6 per cent of the total AGG collection, with the majority of the tropical crop wild relatives collected from northern Australia and unique to the AGG. As of 2018, the AGG has duplicated 16,826 accessions at the Svalbard Global Seed Vault in Norway.

Australian Pastures Genebank

The Australian Pastures Genebank (APG) is Australia's first national pasture and forage genetic resource centre. The APG is working to conserve the diversity of our current and prospective pasture and forage species domestically and internationally, as the basis for enhanced agricultural productivity and environmental preservation. The APG has a mandate to acquire, document, conserve, maintain and distribute all pasture and forage species of actual or potential value to Australian agriculture. This includes plants grown for livestock, crop rotation and the environment. The APG operates under the framework of the International Treaty on Plant Genetic Resources for Food and Agriculture, making small quantities of mandated germplasm and related information available for food and agricultural related scientific research, plant breeding and genetic resource conservation and education.

The APG currently holds 84,838 accessions of wild material represented by 462 genera with 2921 taxa of 2623 species of temperate and tropical pastures and forages from 178 countries. The conservation value of the germplasm held in the APG is high with more than 90 per cent of the germplasm stored being unique to the APG. As of 2018, the APG has duplicated 28,254 accessions at the Svalbard Global Seed Vault in Norway.

Case Study: Developing Crop Wild Relatives

The South Australian Research and Development Institute (SARDI) is leading an Adapting Agriculture to Climate Change: Collecting, Protecting, and Preparing Crop Wild Relatives (CWR) Project. The project is supported by the Global Crop Diversity Trust Fund (Crop Trust) and aims to look at the potential of wild germplasm to improve drought tolerance in alfalfa, to increase food production for a growing population with less water. The project is part of a global effort to better utilise CWR and is working in partnership with the APG and Kew Millennium Seed Bank. The project is developing capacity with researchers and small land holders in Chile, Kazakhstan and Inner Mongolia.

GSPC Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

We continue to implement measures to manage invasive species, for example, *Australian Weeds Strategy 2017–2027* and the *National Plant Biosecurity Strategy*. These strategies provide national frameworks for addressing weed and plant pest issues whilst maintaining the sustainability of Australia's primary industries, and reducing the impact of weeds and plant pests on the environment.

Biosecurity risks are changing as import volumes increase, and pathways become faster and more complex. The objective of our biosecurity system is to manage biosecurity risk to a very low level, but not to zero, to ensure the safe movement of people, animals, plants, food and cargo into Australia. To do this, we use an integrated approach with complementary measures applied across the biosecurity continuum offshore, at the border and onshore.

There are a number of plans, groups and processes that come together to stage an effective response, but importantly, there is just one nationally agreed system used to respond to all pest or disease outbreaks. This Biosecurity Incident Management System (BIMS) is used consistently across the country by the Australian, state and territory governments, Plant Health Australia, Animal Health Australia, and the Commonwealth Scientific and Industrial Research Organisation's Australian Animal Health Laboratory (<http://www.agriculture.gov.au/biosecurity/partnerships/nbc/nbepeg/bims>). BIMS provides a uniform approach to managing the response to biosecurity incidents and can be applied to all biosecurity sectors. Various national response plans, including one that is relevant to plants, PLANTPLAN, complement BIMS, providing disease or plant pest specific response advice. The Australian Government Crisis Management Framework outlines the arrangements used by Australian Government's working together to coordinate responses to incidents. This approach is a continuum of prevention, preparedness, response and recovery.

Other measures include the Chief Environment Biosecurity Officer (CEBO), Australia's primary representative and advisor to the Australian Government on environmental biosecurity risks, who will work with others in the environment sector, and the National Environmental Biosecurity Response Agreement (NEBRA), which enables Australian governments to work together to address specific biosecurity incidents.

Additional information concerning Australia's biosecurity measures can be found in sections II measure 3 and IV, Aichi target 9, invasive alien species prevented and controlled.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

The Australian Government's biosecurity system aims to achieve more sustainable, productive, internationally competitive and profitable Australian agricultural, food and fibre industries, while safeguarding our animal and plant health status from the impact of exotic pests and diseases, and improving the health of our marine and freshwater ecosystems.

Preventing the entry of exotic pests and diseases into Australia, where possible, and minimising their impact through nationally coordinated eradication and management approaches, helps to safeguard our unique biodiversity from the loss of species and genetic diversity, and from alterations to ecosystems. Biosecurity also helps to maintain the social, economic and cultural aspects of the environment, including tourism, human infrastructure and cultural assets.

Biosecurity plays a critical role in reducing risk and shaping Australia as one of the few countries in the world to remain free from some of the world's most harmful pests and diseases. The Australian Government Department of Agriculture, Water and the Environment administers the *Biosecurity Act 2015* and various other Acts, in order to protect our animal, plant and human health status, and to maintain market access for Australian food and other agricultural exports. Our biosecurity initiatives work across the whole biosecurity continuum, from offshore, at-the-border to onshore measures.

In addition, the Australian Government, along with state and territory governments, contributes to responses to biosecurity incidents that primarily impact the environment and/or social amenity under the National Environmental Biosecurity Response Agreement (NEBRA). Since it was signed in 2012, there have been six nationally cost-shared eradication responses managed through the NEBRA. These include three successful eradication programs for Red Imported Fire Ant incursions in Port Botany, New South Wales (eradicated 2017), Yarwun, Queensland (eradicated 2017) and Brisbane airport (eradicated in 2018), also in Queensland. There are also ongoing eradication efforts for Browsing Ant in Northern Territory and Western Australia. An attempt to eradicate Macao Paper Wasp on the Cocos (Keeling) Islands, which are 2,750 kilometres north-west of Western Australia, was made under NEBRA but unfortunately was unsuccessful. The wasps are now under ongoing management as an established species on the islands.

There are also three ongoing responses to environmental biosecurity incursions that pre-date the NEBRA. The response to the incursion of Red Imported Fire Ant in south east Queensland (RIFA- SEQ Program) is the oldest and the largest of the current pest and disease responses in Australia. It has been ongoing since 2001 and has been funded by Australian, state and territory governments under a cost-sharing arrangement similar to the NEBRA. Other ongoing responses are the Electric Ant eradication response in Darwin and the National Tropical Weeds Program in Queensland.

GSPC Target 11: No species of wild flora endangered by international trade

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

On track to achieve target at national level

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates legal international trade in specimens of species of wild fauna and flora to ensure that international trade species is not detrimental to their survival.

Australia became a Party to CITES in 1976 and registers a list of CITES species under the national EPBC Act. The list includes:

- details of the CITES appendix in which a species is listed
- the date on which the CITES provisions first applied to the species
- any conditions or restrictions that may apply to the specimen.

We are active in the work of CITES to help ensure sustainable trade in species and is the representative for Oceania on the Plants Committee, contributing to CITES decision-making through participation in key working groups that discuss and provide advice on implementation of the Convention (<https://www.environment.gov.au/biodiversity/wildlife-trade/cites>).

Statistics concerning illegal trade in flora and fauna to and from Australia indicates that nearly all cases involve fauna, rather than flora. Prosecutions within New South Wales, for example, demonstrate fines associated primarily with the taking of fauna. The most common transgressions for plants was picking part of a plant which is a threatened species (<https://aic.gov.au/publications/rpp/rpp109/illegal-trade-fauna-and-flora-and-harms-biodiversity>).

Our robust quarantine measures have generally prevented trade in illegally taken flora, either within Australia, as there are quarantine measures in place between sub-national governments, or internationally.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

In addition to the information above, please see section IV, Aichi target 3, incentives reformed; Aichi target 12, reducing risk of extinction and Aichi target 16, Nagoya protocol on access and benefit-sharing.

GSPC Target 12: All wild harvested plant-based products sources sustainably

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

In Australia, state and territory government have primary responsibility for the management of native wildlife. Threatened species, including plants, are subject to state and national environment laws, regulating the

possession, clearing, cutting or movement of such species. For example, under the *Biodiversity Conservation Act 2016* in New South Wales, it is an offence to pick, possess, buy or sell native plants listed in the Act for commercial purposes without a licence (<https://www.environment.nsw.gov.au/licences-and-permits/protected-native-plant-licences>). In some cases, management plans may be required to be approved before any commercial use can occur.

Where a threatened plant is nationally listed, a permit is required under national environmental law, the EPBC Act (<https://www.environment.gov.au/biodiversity/threatened/permits>). While the Australian Government has constitutional power over exports and imports, it only becomes involved when native wildlife products are exported overseas.

The demand for bush foods in Australia is increasing, although it is still a small sector when compared with commercially grown crops.

Seed collection has become increasingly common as part of biodiversity conservation projects to protect and manage threatened plants. Seed is usually collected to provide insurance populations at a later date, for genetic research and/or to re-establish populations in protected areas. Guidance on collecting seed sustainably is made available by several sub-national governments, such as New South Wales (<https://www.environment.nsw.gov.au/resources/cpp/SeedCollecting.pdf>) and Western Australia (https://www.dpaw.wa.gov.au/images/documents/about/science/pubs/seednotes/sn02_seedcollection.pdf).

The Australian Seed Bank Partnership follows recognised international protocols for the collection of seed and shares knowledge with a broad range of seed banks, partners and collaborators (<https://www.seedpartnership.org.au/about/whatwedo#collecting>).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

In addition to the information above, see section IV, Aichi target 4, sustainable production and consumption, particularly concerning ecotourism.

GSPC Target 13: Indigenous and local knowledge innovations and practices associated with plant resources, maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

As detailed in previous sections and various related case studies, Indigenous Australians play a critical role in managing the land and sea environment is formally recognised. Both national and sub-national governments adopt a range of approaches for collaborating with Indigenous peoples to develop policies and programs relating to Indigenous land and sea management, including aspects relating to sustainable use and conservation of plant resources. Each jurisdiction fosters relationships across key Indigenous groups to support Indigenous values in conservation and environment, land rights, native title and natural resource management considerations. For example internationally recognised wetlands (Ramsar) and key wetland plant species in those sites that have cultural significance are jointly managed with traditional owners (<https://www.environment.gov.au/water/wetlands/publications/factsheet-wetlands-indigenous-values>).

For additional information refer to sections I, II–measure 5, IV–Aichi target 18 traditional knowledge and VII. The case study on seed conservation in Kakadu National Park also appears in section IV, Aichi target 13, as it is also relevant in safeguarding genetic diversity.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

Case Study: Parks Australia Joint Management

Parks Australia jointly manages three of Australia's National Reserve System properties with Aboriginal traditional landowners. These properties are Kakadu National Park and Uluru-Kata Tjuta National Park in the Northern Territory, and Booderee National Park and Botanic Gardens in New South Wales. Traditional knowledge of the local flora, and cultural uses for food, medicine and fibre contribute to the management of native flora that occurs within these national parks. The Director of National Parks has commenced an Indigenous Pathways project that incorporates and formally recognises Indigenous peoples' traditional skills and knowledge in the management of Australia's jointly managed parks. Park planning processes, including management planning, incorporate traditional owner priorities that have been established through participatory planning, monitoring and reporting. Parks Australia employees continued to engage traditional owners and traditional knowledge in day-to-day park management activities, with a strong focus on engaging young traditional owners.

Case Study: Cultural Continuity at Uluru

Parks Australia worked together with the elder Anangu Women and the Central Land Council to put together the Connection to Country project, known as the Kungka Kutjara Tjukurpa Project: Continuing Connection to Country for Pitjantjatjara and Yankunytjatjara Women. This project aims to enable the transferring of ceremonial and site-related knowledge from elder women to younger generations of the Kungka Kutjara (two women) Tjukurpa. The project was a priority due to the knowledge potentially being lost with elder women. Various opportunities for funding this project were investigated, including approaching philanthropists and businesses. The project would not have been possible without a real partnership approach between all the women, Parks Australia, the Central Land Council (CLC), Mutijulu Foundation, Northern Territory Parks and Digital Storytellers.

The trip took place in May 2017, with 50 women (aged nine to 90 years old) from Mutijulu, Ernabella, Areyonga, Pukatja, Alice Springs and the Watarrka area, as well as two Parks Australia employees, seven Central Land Council staff, and a female film-maker from Digital Storytellers. The trip was also supported by several rangers from Watarrka National Park. The week involved two days of driving and walking, and two days of flying in helicopters and walking to sites of importance along the Kungka Kutjara songline, where story was shared, sung and danced. The women were happy to have the stories recorded for storage in a secure archive, to be edited by the women at a later time. A documentary film now secures the knowledge for future generations. Some women were interviewed individually and there was discussion about a potential public product after editing of the archival material.

This type of work keeps culture strong and alive, and ensures continuity for future generations.

Case Study: Capacity Building in Seed Conservation at Kakadu National Park

Kakadu National Park includes the traditional lands of a number of Aboriginal peoples and is jointly managed with Parks Australia. Since 2014, the traditional owners of Kakadu have been working with staff from the National Seed Bank (NSB) to collect seed from listed threatened and at risk plant species.

The knowledge acquired during joint field trips on how to collect using scientific methods was put to good use in April 2018. Three agencies (NSB, Australian Grains Genebank and George Brown Darwin Botanic Gardens) coordinated by the Australian Seed Bank Partnership, worked with traditional owners to collect the seed of crop wild relatives. The project secured 15 new seed collections from *Cajanus*, *Glycine*, *Oryza*, *Sorghum* and *Vigna* species. The seed bank team taught traditional owners how to record, process and bank collections using basic seed banking equipment that can be used anywhere on country. Traditional owners are now better equipped to participate in plant conservation efforts on country, and to contribute to the mix of traditional and scientific methods that can be used to protect plant species and ensure their future use.

Indigenous knowledge was essential to identifying the location and timing of field collections to ensure seed harvest for the target species. Traditional owners also shared knowledge on the traditional management and collection of wild rice and sorghum within the National Park. This led to interesting discussions and reconsideration of how collections of some species are made. This knowledge will help to make better quality collections in the future, which ultimately ensures the future conservation of plant species at risk.

GSPC Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

Australia is Party to the International Treaty on Plant Genetic Resources for Food and Agriculture. Treaty obligations are taken into account while developing or amending relevant policies that underpin aspects of relevant agricultural sector strategies.

The Australian Seed Bank Partnership (the Partnership) is national collaboration of twelve of Australia's leading botanic gardens, state environment agencies, academic institutions and non-government organisations. The Partnership, launched in 2009, delivers a national program of work focussed on *ex situ* plant conservation that supports the Australian Government's priorities to protect and improve the environment. The Partnership supports policy-makers, researchers, and the conservation and restoration sectors to work collaboratively to help safeguard our plant populations and ecological communities for future generations.

The Green Army Program (2014-18) was a hands-on, practical environmental action program that engaged young Australians aged 17 to 24 years as participants, including Indigenous participants, to complete on-ground projects that provide environmental or heritage conservation benefits to their local community. Each round was designed to achieve specific priorities in support of environmental, heritage and conservation outcomes. Rounds two, three and four investment priorities included protecting and conserving threatened species or ecological communities, migratory species, and regionally significant species, as well as their habitat. Actions included new plantings, both to improve habitat and to reduce erosion, weed removal, removal of rubbish and plant propagation, as well as flora surveys (<https://www.environment.gov.au/land/green-army/publications/green-army-evaluation-report>).

Under the National Landcare Program, community engagement and partnerships mostly occur through receiving support from Regional Landcare Facilitators and other regional body staff. Projects, through a range of sub-programs, have undertaken revegetation and restoration works, including weed and pest removal, as well as plantings to improve habitat. These projects have benefited threatened species, as well as engaging local communities and improving the sustainability of agricultural practices.

As at December 2016, National Landcare Program projects had engaged more than three million volunteers and run more than 12,000 community events, with more than 9000 people completing training courses (Report on the Review of the National Landcare Program, 2017).

Bush Blitz is the largest nature discovery program in Australia. It has been nine years since a unique partnership between the Australian Government Department of Agriculture, Water and the Environment, BHP and Earthwatch Australia began. Bush Blitz has discovered over 1600 new species since 2010, extended the known range of 250 species, and generated more than 500 records of species listed as threatened, vulnerable or endangered, along with over 1200 records of pest species. The program has also recorded more than 25,000 individual occurrences of plants and animals, which can be accessed by land managers, scientists and the general public using online tools such as the Atlas of Living Australia. Since its inception, Bush Blitz has recorded 41 new plant species, including a new *Pelargonium*, confirmed as discovered in the Australian Capital Territory from a Bush Blitz in the ACT/New South Wales Alps (<http://bushblitz.org.au/bush-blitz-nsw-and-act-alps/>).

Projects have been implemented under the *Threatened Species Strategy* and *Threatened Species Prospectus* which have targeted threatened plants. On-grounds actions include seed collection and propagation, habitat protection and threat reduction from predators such as rabbits and native herbivores. Projects undertaken under this model are collaborative, establishing partnerships between government and non-government organisations, as well as with university and researchers. Works have also involved volunteers, community groups and school students, ensuring that knowledge is passed on as a broad range of people contribute to protecting these species and enabling their persistence into the future (<https://www.environment.gov.au/>

[biodiversity/threatened/publications/strategy-home](https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-prospectus); <https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-prospectus>).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

In addition to the information provided above, further examples of communication and awareness are included below.

Botanic Gardens

Australia's botanic gardens deliver a wide variety of education programs and communication activities that engage visitors and provide inquiry-based learning opportunities. Targeted programs, guided walks and self-guided tours reinforce the importance of plants in peoples' everyday lives, including traditional uses by Indigenous Australians and the ecological importance of species and communities. These programs help to improve awareness of the importance of plant diversity and conservation, provide education about activities that threaten natural habitats and encourage audiences to undertake further learning and become ambassadors for the environment.

Australia's capital city botanic gardens and many regionally-based botanic gardens deliver facilitated programs designed to meet Australian education curriculum targets in science, geography, sustainability, and Aboriginal and Torres Strait Islander studies. Experienced educators work with schools to provide learning resources during visits to botanic gardens, as well as to develop free online plant conservation resources. Online resources support schools to continue the education journey in the classroom, consolidate learning outcomes for students and reinforce the importance of plant conservation.

Beyond traditional media, Australian botanic gardens continue to utilise social media and online engagement to improve the awareness and appreciation of plant conservation. Botanic gardens throughout Australia employ science communicators and media experts that work closely with botanists, horticulturalists and conservation scientists, to develop public awareness campaigns about plant conservation. Campaigns are designed to provide comprehensive scientific information in ways that will engage online audiences and encourage interest in plant conservation. Online communication activities aim to boost visitor numbers to botanic gardens, where conservation messaging is reinforced through interpretive signage and gardens-based education programs, such as Indigenous traditional plant use trails, pollination displays and threatened species themed gardens.

Australian Seed Bank Partnership

Part of the mission of the Australian Seed Bank Partnership (ASBP) is to share its knowledge and skills among the network of existing Australian conservation seed banks, restoration practitioners and community groups. In doing so, the Partnership aims to make the most effective use of resources; manage the risk of loss by keeping seeds in different locations; and develop and use regional expertise for our country's varying conditions.

The Partnership links the extensive databases of existing conservation seed banks into one easily accessible resource. This assists with knowing which of our species have been secured and also guides future collecting priorities. Within the next few years, there are plans to encourage community involvement in citizen science projects that link with ASBP conservation and restoration work.

Sharing knowledge among ASBP partner organisations and the wider community builds a greater understanding of seed science in Australia.

The ASBP is also undertaking a Restoring Diversity Project. Habitat restoration work in Australia has been very successful at recreating the overstorey of plants – those taller plants in a particular habitat, such as trees and tall shrubs that provide shade and protection for the smaller plants. A diverse restored overstorey enables many of the larger animals and birds to repopulate an area, but it does not necessarily create a fully functional environment which can sustain itself or bounce back after severe shocks, such as fire or flood.

To achieve this, the understorey must be successfully restored as well – a process that up until now has been challenging because some understorey plant families and species are difficult to propagate.

Some of the most critical gaps are:

- practical techniques for ‘cracking the germination code’ for understorey plants
- understanding the complex ecological relationships among species (plant, animal and microbial)
- how these vary in time and space across Australia.

Filling in these gaps will also enable a more strategic investment of resources.

The *Restoring Diversity Project* will bridge these gaps and the important knowledge generated by this research will directly help rehabilitation practitioners, land managers and community groups in their efforts to restore and reconnect habitats and landscapes throughout Australia

(<https://www.seedpartnership.org.au/about/aboutus>).

GSPC Target 15: The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this strategy

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

Progress towards target at national level but at an insufficient rate

We continue to invest in building skills and capacity to improve plant conservation outcomes through botanic gardens, herbaria and the academic sector. Opportunities for interns and trainees are available throughout Australia at the institutional level, although statistics on interns and trainees specifically engaged for plant conservation are not captured at the national level.

Individual programs, such as Green Army and the National Landcare Program, have a focus on building capacity in communities, amongst landholders and young people, both to improve knowledge of threatened species, but also to enhance skills, with a view to further employment and training opportunities. Thirty per cent of Green Army participants went on to employment, though it is unknown to what extent this was in a biodiversity conservation field (<https://www.environment.gov.au/land/green-army/publications/green-army-evaluation-report>).

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

Botanical Intern and Volunteer Programs

Botanic gardens and herbaria throughout Australia offer annual internships and volunteer training programs that assist in building the capacity and skills of aspiring botanical and plant conservation scientists. These programs provide an opportunity for participants to undertake practical work that build substantial scientific skills including plant identification, plant conservation, collections management and scientific communications.

Australian Universities

There are currently 41 tertiary-level universities operating throughout Australia with campuses located in capital cities and regional centres. At least 34 of Australia’s universities offer undergraduate and post graduate courses related to plant science. Courses offered vary across institutions, with many designed to address regional challenges or respond to employment opportunities on completion of tertiary studies. Courses related to plant sciences currently on offer at Australian universities can be grouped into the following fields: botany, agricultural and crop science, plant biology, horticulture, plant conservation and environmental management.

Additional research opportunities are available for university students to collaborate with botanic gardens, herbaria and seed banks as part of Honours, Masters or PhD studies. Botanic gardens, herbaria and seed banks throughout Australia collaborate directly with universities to deliver projects that address specific conservation challenges associated with environmental conditions, pests and disease, climate change, plant ecology and research, with a focus on specific families, genera or species.

Australian Seed Bank Partnership

The Australian Seed Bank Partnership undertakes regular audits of its partner institutions to establish the level of skills and facilities available to support *ex situ* seed conservation throughout Australia. In 2014, there were eight major conservation seed banks operating throughout Australia, employing nine full time staff and two part-time staff. In 2014, there were also 11 PhD students and six post-doc researchers employed at these institutions, with 20 skilled volunteers assisting in seed banks across Australia.

The most recent audit of Australia's conservation seed banks was finalised in August 2018. It identified nine major conservation seed banks operating throughout Australia, collectively employing 14 full-time and three part-time staff. In 2018, there are 14 PhD students and five post-doc researchers contributing to the work of Australia's major conservation seed banks, simultaneously building skills that help to secure future scientific capacity for the conservation of our native plants. There are currently 51 skilled volunteers that undertake skilled roles throughout Australia's major conservation seed banks. Typical activities delivered by skilled volunteers include seed collecting, seed cleaning, database entry, and providing laboratory assistance for research and germination testing.

The next audit of the Australian Seed Bank Partnership seed banks will occur in 2020.

GSPC Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy

Category of progress towards the target of the Global Strategy for Plant Conservation at the national level

On track to achieve target at national level

Numerous Plant conservation networks have been established or strengthened during the course of the current Global Strategy for Plant Conservation. Evidence of these networks are provided in the following section.

Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description.

Case Study: The Australian Network for Plant Conservation (ANPC)

The Australian Network for Plant Conservation is the only national organisation exclusively focussed on best practice conservation of our native plant and vegetation heritage. It is a non-government organisation that was founded in 1992, with membership open to individuals and supportive organisations. The ANPC translates the latest scientific knowledge into plain language and makes it available to conservation practitioners, through mechanisms such as the quarterly Australasian Plant Conservation bulletin, regional workshops on plant and vegetation conservation, and a biennial national conference. The ANPC has also developed and delivered two editions of the *Plant Germplasm Conservation in Australia – strategies & guidelines* and published the third edition of the *Guidelines for the Translocation of Threatened Plant in Australia* in 2018. The ANPC has also delivered a range of projects that have specifically improved the conservation of threatened species, such as orchids.

Case Study: The Council of Heads of Australasian Herbaria (CHAH)

The Council of Heads of Australasian Herbaria (CHAH) is an effective partnership between all major herbaria in Australia and New Zealand. CHAH's collaborative framework is illustrated by its major projects, the Australasian Virtual Herbarium (AVH) and the Australian Plant Census (APC). The AVH brings together records from more than seven million specimens held in Australian herbaria and is maintained as an online public resource by the Atlas of Living Australia (ALA). The APC is a continent-wide agreed checklist of all Australian vascular plants. In conjunction with the Australian Plant Names Index (a comprehensive Australian plant nomenclature), it underpins Australia's National Species List, which in addition to the vascular plants, provide checklists for all bryophytes, lichens, algae and fungi of Australia. New Zealand herbaria became full members of CHAH in 2011, significantly strengthening existing regional ties between the two countries.

Case Study: Bush Blitz

Bush Blitz is the largest systematic nature discovery program in the world. It coordinates teams of experts from Australia's leading institutions to undertake biological expeditions in areas that are our greatest gaps in biodiversity knowledge. Since the program began in 2010, Bush Blitz has discovered more than 1,600 new species and has added tens of thousands of species occurrence records to publicly accessible databases, increasing Australia's scientific knowledge to help protect the country's biodiversity for generations to come. Bush Blitz is a public-private partnership between the Australian Government, BHP and Earthwatch Australia, which brings together scientists, teachers, reserve managers, Indigenous land owners and local communities. Bush Blitz aims to increase our knowledge and understanding of the taxonomy and distribution of our biodiversity, and better inform land management and conservation. The Bush Blitz model promotes multidisciplinary and cross-sectoral interactions amongst organisations, supporting GSPC objectives to document and understand plant diversity.

Case Study: The Council of Heads of Australian Botanic Gardens Incorporated (CHABG)

The Council of Heads of Australian Botanic Gardens Incorporated (CHABG) is a not-for-profit association established for the purpose of supporting the protection, conservation and enhancement of Australian plants and their ecosystems, as well as the provision of information and education, and undertaking research about plants and plant communities. CHABG works with Australian botanic gardens and other institutions to support and carry out research into the diversity, conservation and ecosystem values of Australian plants and their communities; support the *ex situ* and *in situ* conservation of threatened Australian plants, including through the development and use of seed banks; promote knowledge sharing and education about plants and plant communities; and provide a forum to enhance and promote the botanical, horticultural, educational and environmental work of Australian botanic gardens.

In 2011, CHABG established the Australian Seed Bank Partnership as Australia's largest seed conservation collaboration.

Case Study: The Australian Seed Bank Partnership

The Australian Seed Bank Partnership (ASBP) is a national collaboration of twelve of Australia's leading botanic gardens, state environment agencies and flora-focused non-government organisations. The ASBP delivers a national program of work focussed on *ex situ* plant conservation that supports the Australian Government's priorities to protect and improve the environment. The ASBP supports policy-makers, researchers, and the environmental conservation sector, to work collaboratively to help safeguard our plant populations and ecological communities for future generations. The ASBP also collaborates with the Royal Botanic Gardens, Kew's Millennium Seed Bank Partnership, to contribute to global *ex situ* seed conservation and research. This international partnership enables the ASBP to leverage funding from the philanthropic sector to support Australia's seed banking activities, and contribute to regional collaborations with botanic gardens and plant conservation organisations to share knowledge and build capacity for conservation seed banking. The work of the ASBP is guided by the Australian Seed Bank Partnership *Business Plan 2011–2020* and is governed by The Council of Heads of Australian Botanic Gardens Inc.

VI. ADDITIONAL INFORMATION ON THE CONTRIBUTION OF INDIGENOUS PEOPLES AND LOCAL COMMUNITIES

Australia recognises and values the critical importance of Indigenous land management to the ongoing maintenance of biodiversity, and respects the contribution of Indigenous Australians' traditional knowledge and practice across all types of country—across land and sea scapes.

The area of land owned or formally managed by Indigenous Australians has continued to increase with an estimated 42 per cent of Australia's land, where Indigenous traditional knowledge, cultural practice and natural resource management activities are core to the contribution in managing the local environment (<https://soe.environment.gov.au/theme/land>).

The majority of these lands are concentrated in the northern and central remote third of the continent and reported to include some of the most biodiverse, high conservation value areas that remain relatively ecologically intact. These lands are relatively undisturbed, connected, ecologically healthy, functioning environments and waterways that provide a variety of habitats and ecosystem services.

Many of these areas are not part of the National Reserve System, Indigenous Protected Areas nor are they managed through a formal management plan or arrangement. However, Indigenous peoples, their land, their culture and natural resource management practices are core contributors to managing Australia's environment sustainably, delivering positive results for protecting biodiversity.

Efforts to increase Indigenous engagement and participation are presented throughout this report as a cross-cutting theme in the various programs and initiatives, contributing to the national and global targets. For example:

- the National Environmental Science Program adopted policy approach to engage and partner with Indigenous Australians in all aspects of research activity initiated by each of the six-themed research hubs, proving to generate long-term mutual benefits (see section 1, measure 5)
- the Indigenous Protected Areas, Indigenous Ranger programs and the national and sub-national joint reserve management approaches are also proving successful in generating employment, reinvigorating cultural practices, building capacity and delivering positive outcomes for biodiversity and Indigenous communities (see section II, III, IV, V)
- participation in public policy and decision making forums, including aspects relating to the implementation of EPBC Act via the Indigenous Advisory Committee and through the *Reef 2050 Long Term Sustainability Plan* to manage values of the Great Barrier Reef and national and sub-national traditional use of resources agreements (see sections IV and VI).

National Landcare Program

The following section demonstrates how one program, the National Landcare Program integrates Indigenous engagement principles and, in doing so delivers outcomes that contribute to a range of global targets. The example activities primarily contribute to Aichi targets 6, sustainable management of aquatic living resources, Aichi target 9, invasive species management, Aichi target 14, provision of ecosystem services, particularly with respect to Indigenous and local communities, and Aichi target 18, integration of and respect for traditional knowledge, innovations and practices concerning biodiversity conservation and sustainable use.

During the first phase of the National Landcare Program, the Australian Government invested in projects to build on and strengthen partnerships with Indigenous peoples and local communities, creating more opportunities for their participation in land and sea management and contribution of their significant and unique traditional knowledge and practice.

The program delivers on the Australian Governments' commitment to Closing the Gap on Indigenous Disadvantage (Closing the Gap) by providing opportunities for stronger Indigenous participation in the planning and delivery of National Landcare Program investment and outcomes.

There has been increasing success in Indigenous engagement through activities that support community co-design and planning support, utilising and respecting Indigenous ecological knowledge, capacity building and the effective delivery of on-ground activities.

As demonstrated throughout this report, Indigenous participation in natural resource management not only provides for employment, ongoing knowledge partnerships, economic and social benefits, it also delivers improved outcomes for biodiversity. The opportunities for Indigenous participation in the delivery of natural resource management activities is only limited by the capacity and experience of an Indigenous community to be involved, and in identifying the most suitable and practicable level of involvement.

Indigenous land management projects supported by the National Landcare Program include:

- the recording and continued use, support for the reinvigoration of Indigenous ecological knowledge to underpin biodiversity conservation and the sustainable use of natural resources
- Indigenous ecological knowledge in the Alinytjara Wilurara regional plan, in north-west South Australia
- the use of traditional fire management practice to reduce the intensity of fires and contribute to conserving biodiversity, including savanna burns in Southern Gulf, north-west Queensland and Rangelands, Western Australia, and traditional cool burns in North East Catchment Management Authority, Victoria.

The use of Indigenous traditional ecological knowledge in sustainable farming practices, for example:

- the Yarns on Farms Program, with a project in south-west Victoria at Glenelg Hopkins
- treatment of invasive plants and invasive species management in culturally significant landscapes in the Mallee, north-west Victoria.

The following case studies illustrate where the two-way transfer of knowledge are leading to improved opportunities for Indigenous peoples and improved outcomes for biodiversity (<http://www.nrm.gov.au/indigenous-nrm/knowledge>).

Case study: Fire Journey takes Gaambuwaanaha Ngurambang back to Country

Central Tablelands Natural Resource Management region, central New South Wales

The Gaambuwaanaha Ngurambang (GN) Team from Orange Local Aboriginal Land Council (LALC) is an Indigenous work team undertaking activities including cultural assessments, weed and pest control, native seed collection, plant propagation and revegetation for land management restoration.

The National Landcare Program has supported a team working with Central Tablelands Local Land Services (Central Tablelands LLS) to build and capture traditional ecological knowledge and revive traditional fire management skills on country, for land management and biodiversity outcomes. The team's 'fire journey' began at a local workshop on the property Mawonga and continued to Shadforth, before linking with other traditional owners and knowledge holders at an Indigenous Fire Workshop on Cape York, Queensland.

The team is now applying traditional fire methodologies, also known as traditional cool burns, and techniques to the land, to enhance the native vegetation and improve biodiversity on the property Giralang, which is owned by Orange City Council. This property has major issues with the weed Serrated Tussock (*Nassella trichotoma*), very poor health of native vegetation and low biodiversity, and is described culturally as 'sick country'.

The work on Giralang was also the focus of a presentation at the Nature Conservation Council's 2015 Bushfire conference, held in Sydney at the end of May 2015. This multi-disciplinary fire management conference focused on how fire can be used to rehabilitate degraded landscapes, restore ecological integrity and reinstate resilience into the environment and the community. The GN team co-presented the work they are undertaking on the Giralang property with the Central Tablelands LLS.

They reported together through film how the "country is sick", their aspirations, what it means to apply traditional fire, their activities and their initial findings of the 'western' scientific monitoring that has been established to follow and evidence the Aboriginal science in a respectful manner.

The conference provided an opportunity for both Central Tablelands LLS and the Orange LALC to showcase to a national audience the work that has been done on 'bringing back country' and revival of cultural fire knowledge and practice. Additionally, the networking opportunities with other Indigenous communities, natural resource management regions, agencies and non-government organisations has strengthened future outcomes and opportunities, for both Central Tablelands LLS and the Orange LALC (<http://www.nrm.gov.au/indigenous-nrm/central-tablelands/fire-journey>).

Case study: Collaboration in survey and control

Desert Channels Natural Resource Management region, south-west Queensland

The connection between weeds and declining water quality is well known. A water quality project focussed on eradicating weeds in riparian areas has integrated capacity building and training targeting a group of Lake Eyre Basin Land and Sea Indigenous Rangers to collaborate in weed survey and control.

The Lake Eyre Basin Ranger Coordinator and Longreach-based Rangers, used an online app and tablets in the field, surveying the extent of rubber vine (*Cryptostegia grandiflora*) near Towerhill Creek, central Queensland.

On the control front, the group also treated woody weeds on the Truro Reserve, north of Muttaborra. The work on Truro Reserve formed a valuable link with the work being undertaken by Desert Channels Queensland and landholders, to control woody weeds in the riparian zone of the upper Thomson River catchment.

The rangers spent a week putting into practice the theory of weed control that they had learned. Consistent with the Desert Channels Queensland Area Management Plan, they sprayed any prickly acacia trees that were closer than 30 metres to mature native trees, to ensure they were protected. Tebuthiuron was then applied by hand outside of that area; this will kill the current prickly acacia trees when rain takes the chemical down to the root zone, and it will also kill any germinating plants for a number of years.

Since the treatment, there has been some rain at the site, so the team closely monitored the effectiveness of the control work over the following three months (<http://www.nrm.gov.au/indigenous-nrm/desert-channels/collaboration-survey-control>).

Case study: Developing Indigenous rock oyster farming

Territory Natural Resource Management region in the Northern Territory

Tropical rock oysters have been historically harvested by northern Indigenous communities for food and trade. Local knowledge, historical connection and cultural appropriateness of this resource are all significant factors supporting its suitability as a potential revenue stream for these communities. Tropical rock oyster farming has the potential to open up opportunities for primary production on country, which would bring a range of benefits to the communities, including jobs and local supply of fresh seafood.

Over the past five years, since identifying the potential economic and social opportunities that tropical rock oyster farming may bring to northern Australian Indigenous communities, the Northern Territory Department of Primary Industry and Fisheries (DPIF) has been working in partnership with the Waruwi community on South Goulburn Island, and the Pirlangimpi community on the Tiwi Islands, to conduct blacklip rock oyster trials. Through research based at the Darwin Aquaculture Centre, DPIF has supported the establishment of small-scale oyster enterprises for local consumption and for sale into Australian seafood markets.

The first phase of the project is now complete and the outcomes achieved will help both DPIF and the communities with the next stages of the project. There will be regular contact with the locally-based tropical rock oyster advisory committees, to create an environment of shared ownership for 'on country' aquaculture research and development programs. The long-term nature of such projects is now well understood by all partners. Traditional owners and the local aquaculture team/marine rangers, will work with DPIF to further develop the project, using both science and traditional knowledge. The communities are excited by the prospect of small oyster farms on their doorstep, providing jobs and food (<http://www.nrm.gov.au/indigenous-nrm/territory/rock-oyster-farming>).

VII. UPDATED COUNTRY PROFILE

Biodiversity facts

Status and trends of biodiversity, including benefits from biodiversity and ecosystem services and functions:

Australia's biodiversity is both rich and unique, it is integral to the Australian national identity, Indigenous culture and economy. Characterised by globally distinct ecosystems that supports between 600,000 and 700,000 native species, with more than 85 per cent found nowhere else in the world.

Australia's terrestrial and aquatic biodiversity has developed largely in isolation over many millions of years, making it one of the world's 17 megadiverse countries, with a high level of endemism across a broad range of taxa (<http://www.environment.gov.au/biodiversity/threatened>). The range and diversity of environmental conditions in Australia differs from most other countries and characteristics such as nutrient-poor soils, natural climatic variability, high fire frequencies and a generally flat topography has influenced Australia's distinct biodiversity and evolutionary adaptations.

Marine biota is also megadiverse with distinct levels of species richness in the southern coastal waters where 90 per cent of some groups of organisms are endemic. Australia's terrestrial and marine biodiversity is important both nationally and globally, establishing an obligation for its conservation and sustainable use.

Australia's native vegetation is extraordinarily diverse, rich in species and complexity, and has many unique physical features and is a vital component of the nation's biodiversity. Although Australia retains much of the estimated original extent of native vegetation cover, its condition is variable and masks an underlying issue in the decline of many ecological communities. Vegetation clearance has not been evenly spread across the country and consequently, some individual ecological communities now occupy less than one per cent of their original estimated extent and many others are highly fragmented. A result of this fragmentation is that smaller patches of habitat are an increasingly common component of the remaining habitat in many ecosystems (<http://www.environment.gov.au/land/publications/australias-native-vegetation-framework>).

Of the original estimated extent of Australia's native vegetation, some 13 per cent has been completely converted to other land uses and a further 62 per cent is subject to varying degrees of disturbance and modification. Only around 25 per cent of the original estimated extent of native vegetation remains intact. The *Australia State of the Environment 2016* provides details on the continental extent and condition of our vegetation (<https://soe.environment.gov.au/theme/land/topic/2016/vegetation-0>).

Clearing for urban development, industry and transport has largely impacted the eastern temperate zone. Land use and population pressures have had substantial impacts on the biodiversity of coastal ecosystems. Freshwater habitats have also suffered in recent decades as a result of increasing salinity and nutrient levels, over extraction and alteration of natural flows. In some cases, the threats to the condition and extent of these and other native vegetation communities are ongoing, and likely to be further complicated by climate change.

The loss and degradation of native vegetation is an ongoing pressure on Australia's biodiversity and to the productivity of industry. Agriculture, forestry, fisheries and tourism rely on productive and healthy native vegetation ecosystems, and continue to provide great value to our economy and national development. Native vegetation not only underpins many social and economic aspects of Australian society but also plays a crucial role in sustaining ecosystem function and processes, such as maintaining soils and purifying streams.

All Australian governments and the community have invested significantly in the sustainable use and conservation of native vegetation. For Indigenous Australians, who have managed and utilised native vegetation for thousands of years, the land continues to play a profound spiritual, cultural and economic role. Many land users and managers across Australia value native vegetation and its role in maintaining the long-term productivity of their land. The agricultural and pastoral industries have also undertaken activities to enhance and protect native vegetation. Nevertheless, further action is needed from all land users and managers — public and private — to build on previous achievements, and ensure healthy and resilient native vegetation is retained over our landscape in the long-term.

In recent years, Australia has diversified conservation efforts with increased integration and collaboration across all sectors, delivering practical on-ground actions to conserve and ensure the sustainable management of biodiversity. For example, through accelerated and coordinated action to halt the decline of threatened species and ecological communities the trajectory of eight nationally threatened mammals have improved; coordinated invasive species control programs have contributed to the cull of over 844,000 feral cats; and Australia exceeded the 2020 Aichi target with over 19 per cent of its terrestrial and around 37 per cent of its marine territory under protection, in part by giving recognition to the important role Indigenous Australians play in managing many of these unique and significant areas (<https://www.environment.gov.au/biodiversity/threatened/publications/threatened-species-strategy-year-three-progress-report>).

Despite this, the *Australia State of the Environment 2016* report found that our biodiversity continues to be under increased threat and is continuing to deteriorate. The status of threatened species is considered poor and declining, as many species and communities suffer from the cumulative impacts of multiple pressures, including invasive species, habitat fragmentation and degradation (<https://soe.environment.gov.au/theme/biodiversity>).

Australia's marine environment is an important component of sea and land cultural practice for Indigenous communities, as well as directly and indirectly supporting commercial fisheries and aquaculture. Marine biodiversity and ecosystem health overall are in good condition. There are some individual species and habitats that remain in poor condition or are declining, including a number of iconic species that have failed to recover from the impacts of excessive hunting or fishing. The status of marine biodiversity examining habitat quality, species and populations, and supporting ecological processes found that the North, North-west, South-west and Coral Sea marine regions are all in good condition; and the Temperate East and South-east region are in poor condition (on a scale of very poor to very good) (<https://soe.environment.gov.au/theme/marine-environment>).

Main pressures on and drivers of change to biodiversity (direct and indirect):

Major pressures on biodiversity include fragmentation of habitats; climate change; introduction and spread of invasive alien species (Australia is host to 73 invasive vertebrate animal species and 32 invasive plants species defined as weeds of national significance); grazing pressure; altered fire regimes; changed hydrology; marine and coastal pollution; population growth and the competing pressure of economic development (<https://soe.environment.gov.au/theme/biodiversity>).

Biodiversity has declined since European settlement, and information on environmental pressures suggest that many species continue to decrease in both population size and genetic diversity. The nature of this decline across Australia is complicated, as many species suffer from the cumulative impacts of multiple pressures. Most pressures on biodiversity that arise directly or indirectly from human activities appear to still be strong and those that have declined in some areas, such as land clearing, have legacy effects that will continue for some years or decades.

Invasive species are the most frequently cited pressure affecting species listed as threatened under the EPBC Act. The *Australia State of the Environment 2016* notes that approximately 80 per cent of species are at potential risk from invasive species impacts. Invasive species pose a threat not only through predation but also habitat modification and reducing availability of necessary resources.

Fire frequencies have increased in Australia during the past decade and the alteration in the fire regime to larger fires occurring at shorter fire return intervals is a major threat to many mammals, birds and impacts the viability native plant species. *The action plan for Australian mammals* identified that altered fire regimes place significant pressure on as many as 35 threatened and 22 near threatened mammal species (Woinarski *et al*, 2014; <https://www.publish.csiro.au/book/7010/#details>). The unprecedented bushfires across Australia in the lead up to and in early 2020 devastated millions of hectares of habitat for hundreds of millions of animals, with the true extent of impact yet to be confirmed. A panel of experts made up of researchers, including Indigenous members and all governments will lead an assessment of the impacts on our biodiversity and prioritise recovery efforts to build populations of native plants and animals and ensure their resilience into the future (<https://www.environment.gov.au/biodiversity/bushfire-recovery>).

The Australia's marine environment is subject to varied pressures, driven by increasing use of ocean resources and human-driven environmental change. Historical pressures, such as commercial fishing and oil

and gas exploration, are decreasing, while pressures associated with climate change and marine debris are increasing.

Despite promising investment by all jurisdictions in addressing the main pressures on biodiversity, pressures are not being reduced substantially, nor is the decline in biodiversity being arrested or reversed (<https://soe.environment.gov.au/theme/biodiversity>).

Measures to enhance implementation of the Convention

Implementation of the NBSAP:

A revised NBSAP, *Australia's Strategy for Nature 2019-2030*, and its supporting website, Australia's Nature Hub, were launched in November 2019. Both the revised strategy and the supporting digital platform, represent a new way of managing biodiversity across Australia (<https://www.australiasnaturehub.gov.au/national-strategy>). The strategy was developed and is implemented collaboratively by the Australian Government, all state and territory governments and the Australia Local Government Association. It also draws on the findings of the review of the previous version of the strategy and significant feedback received through stakeholder consultations.

The strategy expands the narrative on biodiversity conservation, and recognises the important role biodiversity plays in all land and sea scapes, including in production areas and cities, and the critical links to human health. It is a shared roadmap to better understand, care for and sustainably manage nature to 2030.

This new approach ensures Australia can:

- be responsive to emerging priorities over the next decade at the global, national, sub-national and local levels
- recognise all sectors and their contributions to positive biodiversity outcomes
- enhance collaboration with all actors.

The framework is comprised of three goals, twelve objectives and 45 measures of progress to guide Australia's biodiversity conservation efforts and monitor implementation of the Strategy. The three goals aim to connect all Australian's with nature, improve the way we care for nature and enhance resilience, and continue to build and share knowledge and experiences. The twelve objectives are: (1) Encourage Australians to get out into nature; (2) Empower Australians to be active stewards of nature; (3) Increase Australians' understanding of the value of nature; (4) Respect and maintain traditional ecological knowledge and stewardship of nature (5) Improve conservation management of Australia's landscapes, waterways, wetlands and sea scape; (6) Maximise the number of species secured in nature; (7) Reduce threats and risks to nature and build resilience; (8) Use and develop natural resources in an ecologically sustainable way; (9) Enrich cities and towns with nature; (10) Increase knowledge about nature to make better decisions; (11) Share and use information effectively; (12) Measure collective efforts to demonstrate our progress.

Monitoring and reporting on the goals and objectives in the strategy is guided by 45 progress measures. Publicly available progress reports will be published every four years, aligning with Australia's reporting to the Convention on Biological Diversity.

[Australia's Nature Hub](#) website transparently shares biodiversity related efforts, enabling analysis identification of areas of duplicative effort or where more action is needed. This approach aims to support collaboration and cooperation across all jurisdictions.

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, wetlands and heritage places – defined in the EPBC Act as matters of national environmental significance. Nationally threatened species and ecological communities are one of the eight matters of national environmental significance (<http://www.environment.gov.au/biodiversity/threatened>). A statutory review of the EPBC Act commenced on 29 October 2019. An independent reviewer supported by an Expert Panel will, over a 12 month period,

look at the operation of the Act, identify any changes needed to support ecologically sustainable development into the future.

Overall actions taken to contribute to the implementation of the Strategic Plan for Biodiversity 2011-2020:

Australia has a range of policies and programs in place to contribute to the *Strategic Plan for Biodiversity 2011–2020* and provide for the protection and conservation of biodiversity and address the ongoing decline. The *Australia State of the Environment 2016* found that, as a result of this commitment, some improvements in the state and trends of parts of our environment can be observed.

Australia has exceeded the global Aichi target for protection of biodiversity, with 19 per cent terrestrial and around 37 per cent marine territories being secured in protected areas. Indigenous peoples are engaged in protecting and managing close to half of these areas, integrating their traditional knowledge, expertise and cultural practice for the benefit of conserving the biodiversity.

Threatened species management has also accelerated in effort, since the establishment of a Threatened Species Commissioner in 2014 to bring a national focus to threatened species, assisting to prioritise investments and efforts to enhance their impact, coordinate action, and build public awareness. The Commissioner is leading implementation of the *Threatened Species Strategy* and the five-year priority action plan targeting threatened species recovery actions underpinned by science and adaptive management.

Having been in place for over 20 years, the National Heritage Trust continues as the Australian Government's long standing commitment to conserve, repair and replenish Australia's natural environment, channelling funds to various national programs. One such program is the National Landcare Program which aims to protect Australia's water, soil, plants, animals and ecosystems, as well as support the productive and sustainable use of these valuable resources.

The National Landcare Program encompasses the 20 Million Trees, Indigenous Protected Areas and Regional Land Partnerships programs as well as the Threatened Species Recovery Fund. Delivered in partnership with regional natural resources management groups; sub-national governments; Indigenous groups; industry bodies; land managers; farmers; landcare groups and communities. These programs target national priority projects to deliver biodiversity conservation outcomes across the country. Investments have supported achievement of conservation targets through our National Reserve System (establishment and management of terrestrial and marine reserves and the Indigenous Protected Areas), targeted recovery action for priority threatened species and ecosystems, support for local communities to take practical conservation action to address national priorities, and has helped restore biodiversity on public and private land, as well as community capacity-building and engagement. (<http://www.nrm.gov.au/national-landcare-program/phase-one>; www.nrm.gov.au/national-landcare-program; <http://www.environment.gov.au/land/nrs/about-nrs>).

The critical importance of Indigenous land management to the ongoing maintenance of biodiversity is increasing and becoming better understood. The National Landcare Program and other associated programs are supporting and promoting Indigenous Australians to deliver practical on-ground actions for managing threats to biodiversity and assisting threatened species recovery. Actions include on-country management of feral pests, restoring traditional fire regimes, knowledge sharing and monitoring.

Other programs that have contributed significant investment to benefit biodiversity outcomes, or are critical to addressing threats to biodiversity include the Green Army program (2014–2018), the Biodiversity Fund (2011–2018) and significant ongoing investment in the Great Barrier Reef by the Reef Trust. These programs have supported conservation and management in urban and regional areas, biologically-diverse and farm-based carbon activities, and marine planning and conservation.

The EPBC Act is our national environmental legislation, which commenced 16 July 2000. The EPBC Act provides for the identification and listing of threatened species and ecological communities, the development of recovery plans for listed species and communities, the recognition of key threatening processes and, where appropriate, reducing the impact of these processes through the development and implementation of threat abatement plans. The international movement of wildlife and wildlife products for commercial purposes is also regulated under the EPBC Act and other legislation to meet CITES obligations (<http://www.environment.gov.au/biodiversity/wildlife-trade/law>).

All sub-national governments have their own legislation for listing threatened species and communities. Establishing a Common Assessment Method has enabled sub-national governments to align lists, including for species that occur across jurisdictional boundaries, with national lists established under the EPBC Act. This process supports better coordination and cooperation in the management of threatened species and communities, with consistent categories and criteria being applied for a national approach to species and community listings (<https://www.environment.gov.au/biodiversity/threatened/cam>).

The threat of pollution on the conservation of biodiversity is being addressed through the National Pollutant Inventory together with collective action across all sectors to implement the *National Waste Policy 2018*. The National Pollutant Inventory goals include the maintenance and improvement of ambient air quality, as well as marine, estuarine and fresh water quality; minimising environmental impacts associated with hazardous waste and improving the sustainable use of resources (<http://www.npi.gov.au/>).

Australia's National Representative System of Marine Protected Areas includes 314 marine parks: 60 marine parks managed by the Australian Government (58 Australian Marine Parks located around the country, the Great Barrier Reef Marine Park, and the Heard Islands and McDonald Islands Marine Reserve in the Southern Ocean) and 254 marine parks managed by state and territory governments in coastal waters. The 58 Australian Marine Parks are managed under six statutory management plans for the North, North-west, South-west, South-east and Temperate East Marine Parks Networks and for the Coral Sea Marine Park. Informed by the best available science and advice of stakeholders, Indigenous peoples and the general public, these plans provide for the protection and conservation of biodiversity and other natural, cultural and heritage values, and allow for the sustainable use of natural resources. The management plans are implemented through seven management programs for: communication, education and awareness; tourism and visitor experience; Indigenous engagement; marine science; assessments and authorisations; park protection and management; and compliance.

Park management is one of a range of Australian Government initiatives for protecting the marine environment and ensuring sustainable use of marine resources, such as marine bioregional plans, recovery plans for threatened species, threat abatement plans for key threats, regulation of environmental practices for offshore petroleum mining, and sustainable fisheries management. Australian marine park network, Australia is actively and sustainably managing its fisheries (<https://www.environment.gov.au/marine/fisheries>). A coordinated ecosystem-based fisheries management (EBFM) approach is being implemented across all its fisheries to ensure sustainable fisheries management. Implementation has focused on a number of key initiatives, such as harvest strategies and ecological risk assessments. Commonwealth managed fisheries are subject to strategic environmental assessments, which assess the impacts of fishing on the marine environment against the EPBC Act, through the Guidelines for the Ecologically Sustainable Management of Fisheries (2nd edition) (<https://www.environment.gov.au/marine/publications/guidelines-ecologically-sustainable-management-fisheries>). The *Commonwealth Policy on Fisheries Bycatch*, released in 2000 and revised in 2018, seeks to ensure that direct and indirect impacts of fisheries on marine systems are taken into account and managed accordingly (<http://www.agriculture.gov.au/fisheries/environment/bycatch/review>).

Support mechanisms for national implementation (legislation, funding, capacity-building, coordination, mainstreaming, etc.):

The EPBC Act focuses on the protection of matters of national environmental significance, with the sub-national governments having responsibility for matters of state and local significance. The EPBC Act is the primary mechanism at the national level for ensuring that environmental considerations, including biodiversity, are considered in planning and decision-making processes across all sectors. Under the EPBC Act, actions that have, or are likely to have, a [significant impact](#) (as defined by the legislation) on a matter of national environmental significance require approval from the Australian Government Minister for the Environment (the Minister). The Minister will decide whether assessment and approval is required under the EPBC Act (<https://www.environment.gov.au/epbc/about>).

Australia continues to face major challenges in ensuring sustainable water supply in the face of a drying climate and growing demand for water. In response, the Australian Government provides national leadership in water policy and legislation reform for all Australians. Through legislation such as the *Water Act 2007* and policy reform agendas such as the National Water Initiative, all Australian governments are working to

ensure best practice in approaches to water resource management (<https://www.agriculture.gov.au/water/policy>).

The new biodiversity strategy—*Australia’s Strategy for Nature 2019–2030*—marks a new and innovative approach to biodiversity conservation in Australia. The revised strategy continues to be underpinned by science and strives to incorporate adaptation, resilience and sustainable natural resource management, moving beyond purely protection principles. It expands the focus of biodiversity conservation to all landscapes, including marine, agricultural and urban environments. The Strategy is a flexible and adaptive framework allowing all jurisdictions to set targets in relation to their circumstances.

Australia’s biosecurity system has been modernised and steps up collaboration across Australia to prevent, respond to and recover from pests and diseases that threaten the environment and the economy. The *Australian Weeds Strategy 2017–2027* and *Australian Pest Animal Strategy 2017–2027* are guiding national efforts for addressing invasive species, contributing to the sustainability of industry and protecting biodiversity.

Released in 2018, the *Environmental-Economic Accounting Strategy and Action Plan* aims to deliver a common approach to environmental-economic accounting in Australia. A nationally consistent approach will ensure coherent, comprehensive and integrated accounts are built and support public and business decision making at all levels and across all sectors, including consideration of biodiversity values. It will also help to address information gaps, and brings together environmental and economic information in a coherent way allowing aggregation and comparison across sub-national jurisdictions.

With the completion of Phase One of the National Landcare Program in July 2018, the National Landcare Program Phase Two (to be delivered 2017–2018 to 2022–2023) is continuing to invest in the management of our biodiversity and natural resources. In partnership with governments, industry, communities and individuals, the protection and conservation of our water, soil, plants, animals and ecosystems will continue, as well as the support of the productive and sustainable use of these valuable resources (<http://www.nrm.gov.au/national-landcare-program>).

All Australian governments have taken steps to limit further decline in the extent and condition of native vegetation. In addition to sub-national regulations restricting clearing of native vegetation, governments have invested in incentive and stewardship programs, extension support, and research and development to help and reward farmers who invest in native vegetation management, and enhance the public good benefits of native vegetation on agricultural land. A range of private sector initiatives have emerged and farmers are taking private action to enhance the extent and condition of native vegetation and the ecosystem services it provides.

The National Wildlife Corridors Plan is an Australian Government initiative to support the reconnection of habitat areas across the Australian landscape. It lays the foundation for collaborative, whole-of-landscape initiatives to conserve the nation's biodiversity, by improving the resilience of the landscapes in a changing climate and repairing landscapes that have become fragmented. Creating a network of wildlife corridors contributes to healthy and productive landscapes that support and sustain biodiversity, communities and wellbeing (<https://www.environment.gov.au/topics/biodiversity/biodiversity-conservation/wildlife-corridors/what-are-wildlife-corridors>).

Australia’s *Native Vegetation Framework 2012* agreed by Australia’s national and sub-national governments provides strategic guidance for the ecologically sustainable management of native vegetation across Australia, while recognising the essential role that native vegetation plays in conserving and promoting a biologically diverse and thriving natural landscape. The framework sets five goals and a series of measurable time-bound targets under each goal (<https://www.environment.gov.au/land/publications/australias-native-vegetation-framework>).

Mechanisms for monitoring and reviewing implementation:

Australia’s Strategy for Nature 2019–2030 guides Australia’s efforts to conserve and protect biodiversity—covering the actions of a local community group through to objectives of national-scale programs.

The Australian Government, all state and territory governments, and the Australian Local Government Association, are working together to track the strategy’s implementation through the progress measures outlined for each objective. In addition, the Strategy is supported by a website called Australia’s Nature

Hub, which provides an online national platform to communicate the range of biodiversity-related actions at all levels across Australia. The Nature Hub will help demonstrate actions across sectors contributing to the Strategy's goals and objectives, and will enhance sub-national, national and international reporting, including for global biodiversity frameworks such as the Sustainable Development Goals, the Convention on Biological Diversity's Aichi Targets (<https://www.australiasnaturehub.gov.au/national-strategy>), and future targets.

Across Australia, officials from national and sub-national environment departments support environment ministers in their decision making through the Biodiversity Working Group. The working group will evaluate and report on the implementation of the revised Strategy to environment ministers every two years, tracking progress measures against set objectives.

The Australian Government will continue to monitor progress in achieving biodiversity outcomes over the life of the Strategy, drawing on existing national monitoring programs, systems and through regular reporting by the delivery partners and agents. Various monitoring tools have been included in the framework of sectoral programs and action plans (e.g. *Australia's Native Vegetation Framework*; *the Monitoring, Evaluation, Reporting and Improvement (MERI) Framework*; *the online MERI Tool*, *Threatened Species Strategy*). The Australian Government is also developing a targeted Long-term Monitoring Program to better track the outcomes of Australian Government investment in NRM over time. Non-government organisations and citizen science are also increasingly contributing to monitoring at the sub-national level. Australia's state of the environment reports have been opportunities to collate and synthesise such information (<https://soe.environment.gov.au/theme/biodiversity/topic/2016/availability-information-0>).