

— CHAPTER 1 —

ABOUT THIS REPORT



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1.1 Background

The Great Barrier Reef Marine Park Authority (the Marine Park Authority) prepares an Outlook Report for the Great Barrier Reef Region (the Region) every five years. The *Great Barrier Reef Marine Park Act 1975* (Cth) (the Act) and the regulations applying to the Great Barrier Reef Marine Park (the Marine Park) (Appendix 1) specify what the report must contain and the relevant statutory timeframes.

The first Great Barrier Reef Outlook Report¹ (Outlook Report) was released in 2009 and the second in 2014². This Outlook Report, like previous reports, plays a significant role in informing Australia's reports to the World Heritage Committee addressing the property's world heritage status, the review of the *Reef 2050 Long-Term Sustainability Plan* (Reef 2050 Plan) and effective management of the Great Barrier Reef (the Reef).

Outlook Reports are a regular and reliable means of assessing the overall performance of all measures to protect and manage the Reef in an accountable and transparent manner. The report provides a summary of the long-term outlook for the Reef based on assessments of condition, use, influencing factors, management effectiveness, resilience and risks.

The Act does not provide for the Outlook Report to include recommendations about future protection or management initiatives. Rather, the report provides an evidence-based assessment that identifies future trends, risks and threats, to inform future protection and management initiatives. It builds upon previous reports by providing a snapshot of the current condition of the Reef and examines how its condition has changed from previous reporting, predominantly since 2014. While much of the report's assessment focuses on the retrospective performance over a five-year period, a forward-looking long-term outlook is also provided (Chapter 10).

1.2 Scope

The jurisdictional scope of the report covers the entire Great Barrier Reef Region (Figure 1.1). The Region is a Commonwealth jurisdiction covering approximately 346,000 square kilometres, from the tip of Cape York in the north to past Lady Elliot Island in the south, with mean low water as its western boundary and extending eastwards a distance of between 70 and 250 kilometres to the eastern border with the Coral Sea Marine Park. It excludes the Torres Strait Region. The Region's boundary is slightly larger than the Marine Park and it includes the air above to a height of 915 metres, the subsoil beneath the surface of any land to a depth of 1000 metres, and about 70 Commonwealth islands.³ The State of Queensland has jurisdiction over the majority of islands in the Reef (approximately 980 islands) which are, therefore, not included formally within the Region. However, where it is relevant to the health of, or factors influencing, the Great Barrier Reef ecosystem and its heritage values, the report looks beyond the Region's boundaries and includes information about adjacent islands, neighbouring marine areas and the Great Barrier Reef river catchments (the Catchment). Jurisdictional differences between the various areas described in the report are outlined below (Table 1.1 and Figure 1.2). Additional information on jurisdictions and management responsibilities is provided in Chapter 7 (Section 7.1.1).

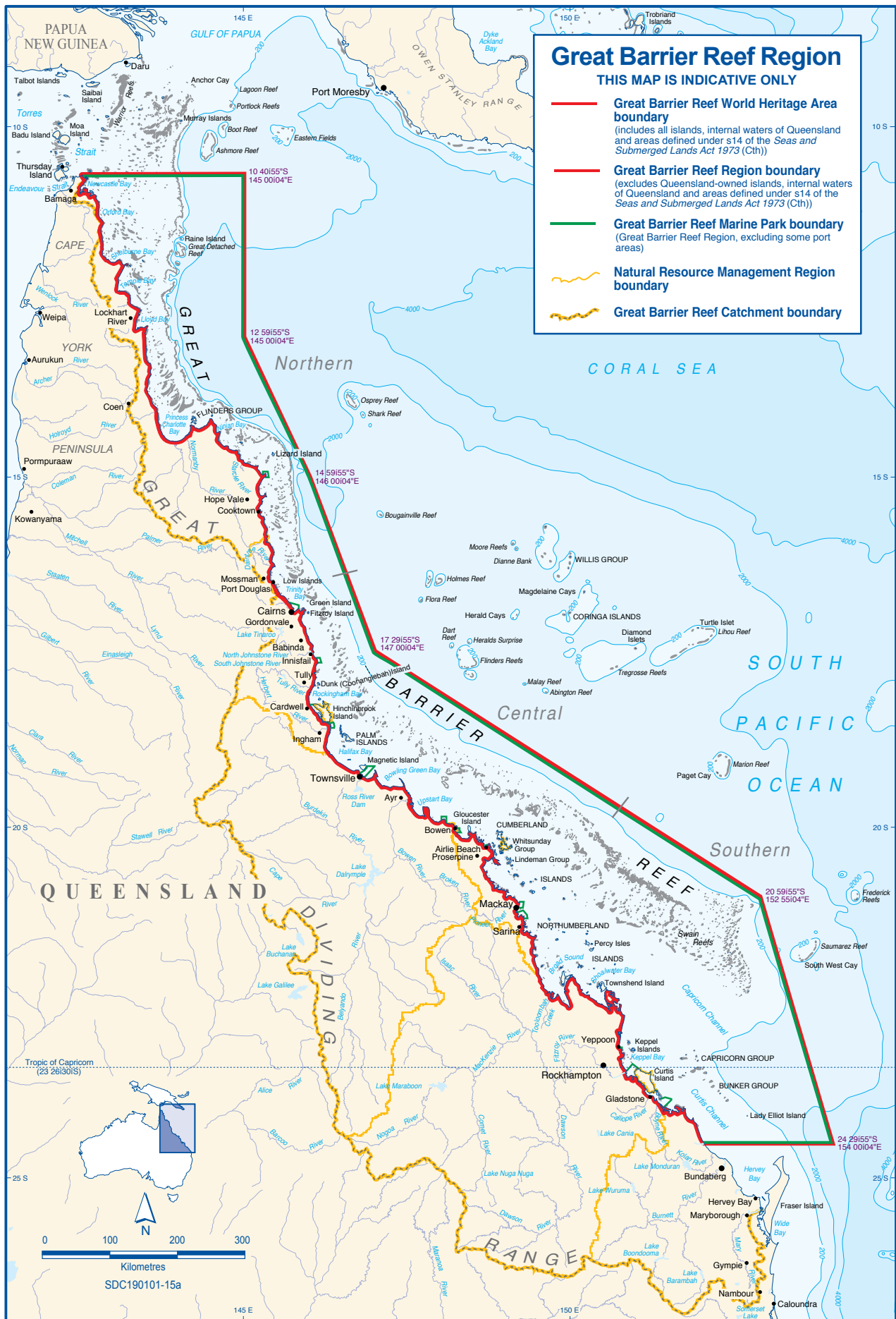
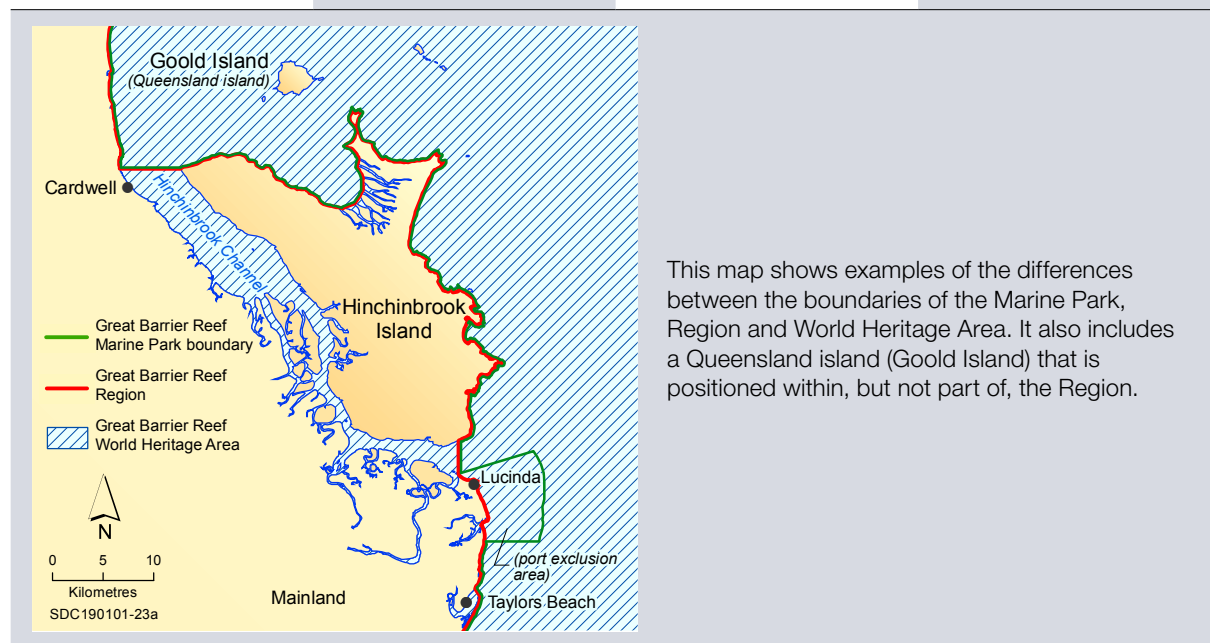


Figure 1.1 Great Barrier Reef Region and Catchment

Table 1.1 Differences between the Great Barrier Reef Marine Park, Region, World Heritage Area and Catchment
The square kilometres of each area is an approximation only. Terms relating to ports are described in Section 5.7.

Great Barrier Reef Marine Park	Great Barrier Reef Region	Great Barrier Reef World Heritage Area	Great Barrier Reef Catchment
Declared in sections between 1979 and 2001; amalgamated into one section by proclamation in 2004	Established 1975	Inscribed 1981	
344,400 km ²	346,000 km ²	348,000 km ²	424,000 km ²
Includes: <ul style="list-style-type: none"> • approximately 70 Commonwealth islands • all waters seaward of low water mark (excluding Queensland internal waters and trading ports) 	Includes: <ul style="list-style-type: none"> • approximately 70 Commonwealth islands • all waters seaward of low water mark (excluding Queensland internal waters) • 12 coastal exclusion areas (12 trading ports) and maritime port infrastructure 	Includes: <ul style="list-style-type: none"> • all islands within outer boundary (approximately 1050), comprising approximately 70 Commonwealth islands and approximately 980 Queensland islands • all waters seaward of low water mark (including Queensland internal waters) • 12 coastal exclusion areas (12 trading ports) and maritime port infrastructure 	Includes: <ul style="list-style-type: none"> • 35 river basins that flow into the Great Barrier Reef Region • six natural resource management regions: Cape York, Wet Tropics, Burdekin, Mackay–Whitsunday, Fitzroy and Burnett–Mary • land-based port infrastructure
Does NOT include: <ul style="list-style-type: none"> • internal waters of Queensland • Queensland islands (approximately 980) • 12 coastal exclusion areas (trading ports) 	Does NOT include: <ul style="list-style-type: none"> • internal waters of Queensland • Queensland islands (approximately 980) 		Does NOT include: <ul style="list-style-type: none"> • land seaward of low water mark • maritime port infrastructure



The Outlook Report assesses all parts of the ecosystem within the Region, ranging from species and habitats to key ecosystem processes. For the purposes of this report, the ecosystem components within the Region are collectively referred to as the Great Barrier Reef ecosystem or simply the Great Barrier Reef. The report also assesses all aspects of the Region's heritage values, including Indigenous and historic heritage values and its world heritage value.

The Reef was inscribed on the World Heritage List in 1981 for all four natural criteria. The assessment of the condition of the Region's world heritage value in Chapter 4 is directly informed by Chapters 2 and 3, which provide grades for a suite of natural heritage components. In addition, Appendix 3 presents a matrix describing how the components assessed in this report correspond with the attributes (outstanding features) that comprise the statement of outstanding universal value.

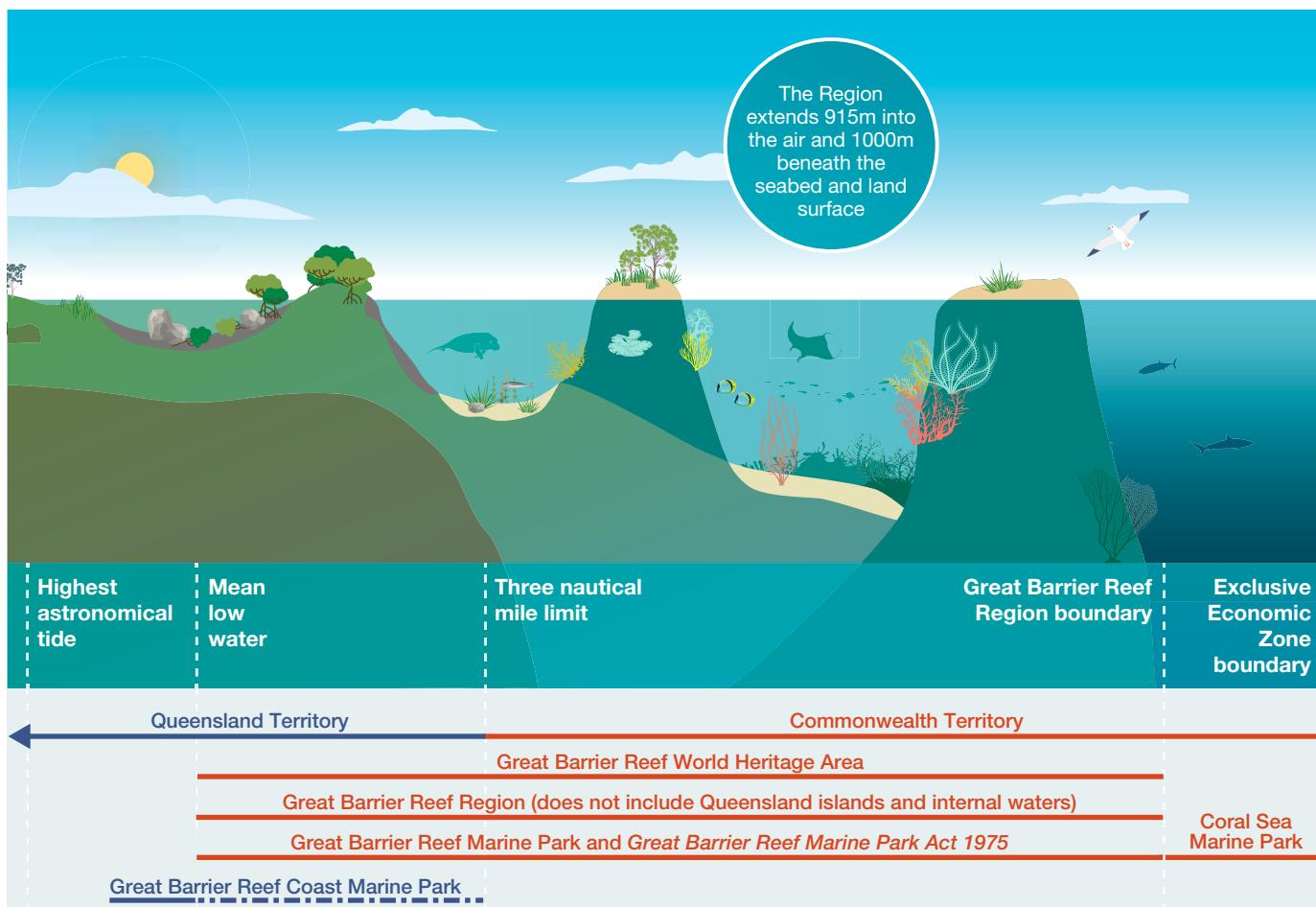


Figure 1.2 Jurisdictional boundaries

The Great Barrier Reef Region encompasses both Commonwealth (red) and Queensland (blue) jurisdictions. The Queensland territory extends from the land to the three nautical mile limit (and around Queensland islands). The dashed line indicates that the Great Barrier Reef Coast Marine Park includes the Queensland-owned islands that lie within the Region. Additional information on jurisdictions and management responsibilities is provided in the expanded version of this diagram in Chapter 7 (Section 7.1.1).

1.3 Structure

The Outlook Report looks back over the last five years and collates a Region-wide assessment of the current condition of the Reef's ecosystem and heritage values. The report is structured around the nine assessments required by the Act and its regulations, with each assessment forming a chapter of the report (Figure 1.3). Chapters fall into three main themes: (i) values; (ii) threats, management responses, resilience and risk; and (iii) the long-term outlook for the Region. The four chapters on the values of the Reef focus on current condition and trends. Likely future trends in those values depend on the drivers influencing them, which are discussed in later chapters.

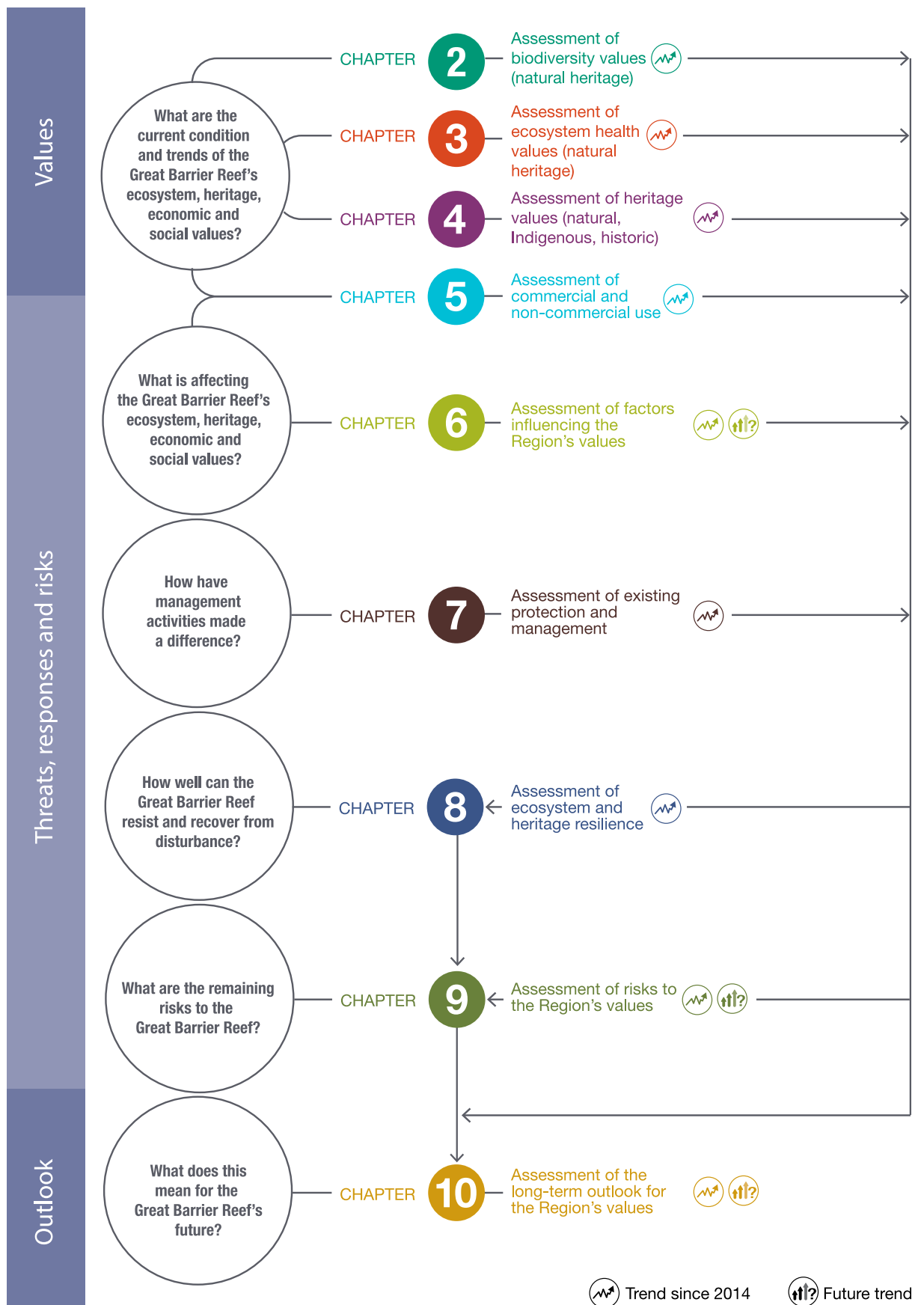


Figure 1.3 Assessments within the 2019 Outlook Report

Each of the assessments required under the Act and regulations applying to the Great Barrier Reef Marine Park forms a chapter of the report. The assessments relate to the condition of the Great Barrier Reef Region's ecosystem and its heritage value and examine threats, responses and risks. These then inform an assessment of the likely outlook for the Region's values.

1.4 Assessment approach

For each of the required statutory assessments (Appendix 1), specific criteria and grading statements guide the analysis of available evidence and provide transparency (Figure 1.4 and Table 1.2). For example, the assessment of biodiversity (Chapter 2) uses two assessment criteria: (i) habitats to support species, and (ii) populations of species or groups of species. Each assessment criterion comprises several components (Table 1.2). Based on analysis of the evidence available, each component receives an assessment grade (Section 1.4.1) and trend since the last Outlook Report (Section 1.4.2) at the scale of the Region. The component results are then combined to inform the grade for the overarching assessment criterion (Figure 1.5). Determination of both criteria grades and component level grades are guided by reference to standard grading statements (Section 1.4.1). Criteria and component assessments are presented in a table in the assessment summary at the end of each chapter.

In Chapters 2 to 4, over 80 components of the Region’s natural, Indigenous and historic value are assessed (Table 1.2). Economic and social values of the Reef, which depend on the health of the ecosystem, are considered in a range of places in the report, particularly in Chapters 4 to 6.

To maintain the comparative value of the Outlook Report over time, changes to the assessed components have been limited to instances where they significantly improve the validity or utility of the assessment. For example, some changes to the assessment components examined in 2014 have occurred, predominantly the name of components that have not affected the scope of what is assessed or continuity of grades (changes are listed in Appendix 2).

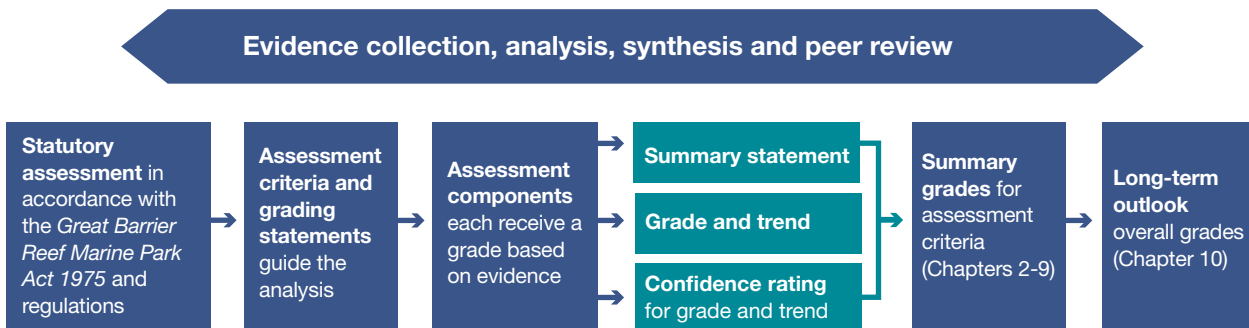


Figure 1.4 Assessment approach to determine final grades

The required assessments are based on the best available evidence. Grades are standardised against grading statements presented with each assessment summary.



Tabular corals. © Tane Sinclair-Taylor 2016

Table 1.2 Assessment criteria and their components

Each chapter of the report contains assessments of a specific set of criteria (bold text) and components (bullet points).

Chapter 2: Biodiversity	
<p>Habitats to support species</p> <ul style="list-style-type: none"> Islands Mainland beaches and coastlines Mangrove forests Seagrass meadows Coral reefs Lagoon floor Shoals Halimeda banks Continental slope Water column 	<p>Populations of species and groups of species</p> <ul style="list-style-type: none"> Mangroves Seagrasses Benthic algae Corals Other invertebrates Plankton and microbes Bony fishes Sharks and rays Sea snakes Marine turtles Estuarine crocodiles Seabirds Shorebirds Whales Dolphins Dugongs
Chapter 3: Ecosystem health	
<p>Physical processes</p> <ul style="list-style-type: none"> Currents Cyclones and wind Freshwater inflow Sediment exposure Sea level Sea temperature Light <p>Chemical processes</p> <ul style="list-style-type: none"> Nutrient cycling Ocean pH Ocean salinity <p>Ecological processes</p> <ul style="list-style-type: none"> Microbial processes Particle feeding Primary production Herbivory Predation Symbiosis Recruitment Reef building Competition Connectivity 	<p>Coastal ecosystems that support the Great Barrier Reef</p> <ul style="list-style-type: none"> Saltmarshes Freshwater wetlands Forested floodplains Heath and shrublands Grass and sedgeland Woodlands and forests Rainforests <p>Outbreaks of disease, introduced species and pest species</p> <ul style="list-style-type: none"> Outbreaks of disease Outbreaks of crown-of-thorns starfish Introduced species Other outbreaks
Chapter 4: Heritage values	
<p>Natural heritage values — world heritage and national heritage value</p> <ul style="list-style-type: none"> Natural beauty and natural phenomena Major stages of the Earth's evolutionary history Ecological and biological processes Habitats for conservation of biodiversity Integrity Natural heritage values <p>Indigenous heritage values</p> <ul style="list-style-type: none"> Cultural practices, observances, customs and lore Sacred sites, sites of particular significance and places important for cultural tradition Stories, songlines, totems and languages Indigenous structures, technology, tools and archaeology 	<p>Historic heritage values — Commonwealth heritage values</p> <ul style="list-style-type: none"> Commonwealth heritage value <p>Historic heritage values</p> <ul style="list-style-type: none"> Commonwealth lightstations Other historic lightstations and lighthouses Historic voyages and shipwrecks World War II features and sites Other places of historic significance <p>Heritage values — other</p> <ul style="list-style-type: none"> Social heritage value Aesthetic heritage value Scientific heritage value
Chapter 5: Commercial and non-commercial use	
<p>Economic and social benefits of use</p> <ul style="list-style-type: none"> Commercial marine tourism Defence activities Fishing Recreation (not including fishing) Research and educational activities Ports Shipping Traditional use of marine resources 	<p>Impacts of use on the Region's values</p> <ul style="list-style-type: none"> Commercial marine tourism Defence activities Fishing Recreation (not including fishing) Research and educational activities Ports Shipping Traditional use of marine resources
Chapter 6: Factors influencing the Region's values	
<p>Impacts on ecological values</p> <ul style="list-style-type: none"> Climate change Coastal development in the Catchment Land-based run-off Direct use <p>Impacts on heritage values</p> <ul style="list-style-type: none"> Climate change Coastal development in the Catchment Land-based run-off Direct use 	<p>Impacts on economic values</p> <ul style="list-style-type: none"> Climate change Coastal development in the Catchment Land-based run-off Direct use <p>Impacts on social values</p> <ul style="list-style-type: none"> Climate change Coastal development in the Catchment Land-based run-off Direct use
Chapter 7: Existing protection and management	
<p>Elements of the management cycle (overall assessment)</p> <ul style="list-style-type: none"> Understanding of context Planning Financial, staffing and information inputs Management systems and processes Delivery of outputs Achievement of outcomes 	<p>Individual management topics</p> <ul style="list-style-type: none"> Climate change Coastal development Land-based run-off Commercial marine tourism Defence activities Fishing Ports Recreation (not including fishing) Research activities Shipping Traditional use of marine resources Biodiversity values Heritage values Community benefits of the environment
Chapter 8: Resilience	
<p>Ecosystem resilience</p> <ul style="list-style-type: none"> Coral reef habitats Lagoon floor habitats Black teatfish (sea cucumber) Coral trout Loggerhead turtles Urban coast dugongs Humpback whales 	<p>Heritage resilience</p> <ul style="list-style-type: none"> Cultural practices, observances, customs and lore Lightstations Historic shipwrecks
Chapter 9: Risks to the Region's values	
<p>Overall risk to the ecosystem (natural heritage values)</p> <p>Overall risk to heritage values (Indigenous, historic and other)</p>	
Chapter 10: Long-term outlook	
<p>Outlook for the Region's ecosystem</p> <p>Outlook for the Region's heritage values</p>	

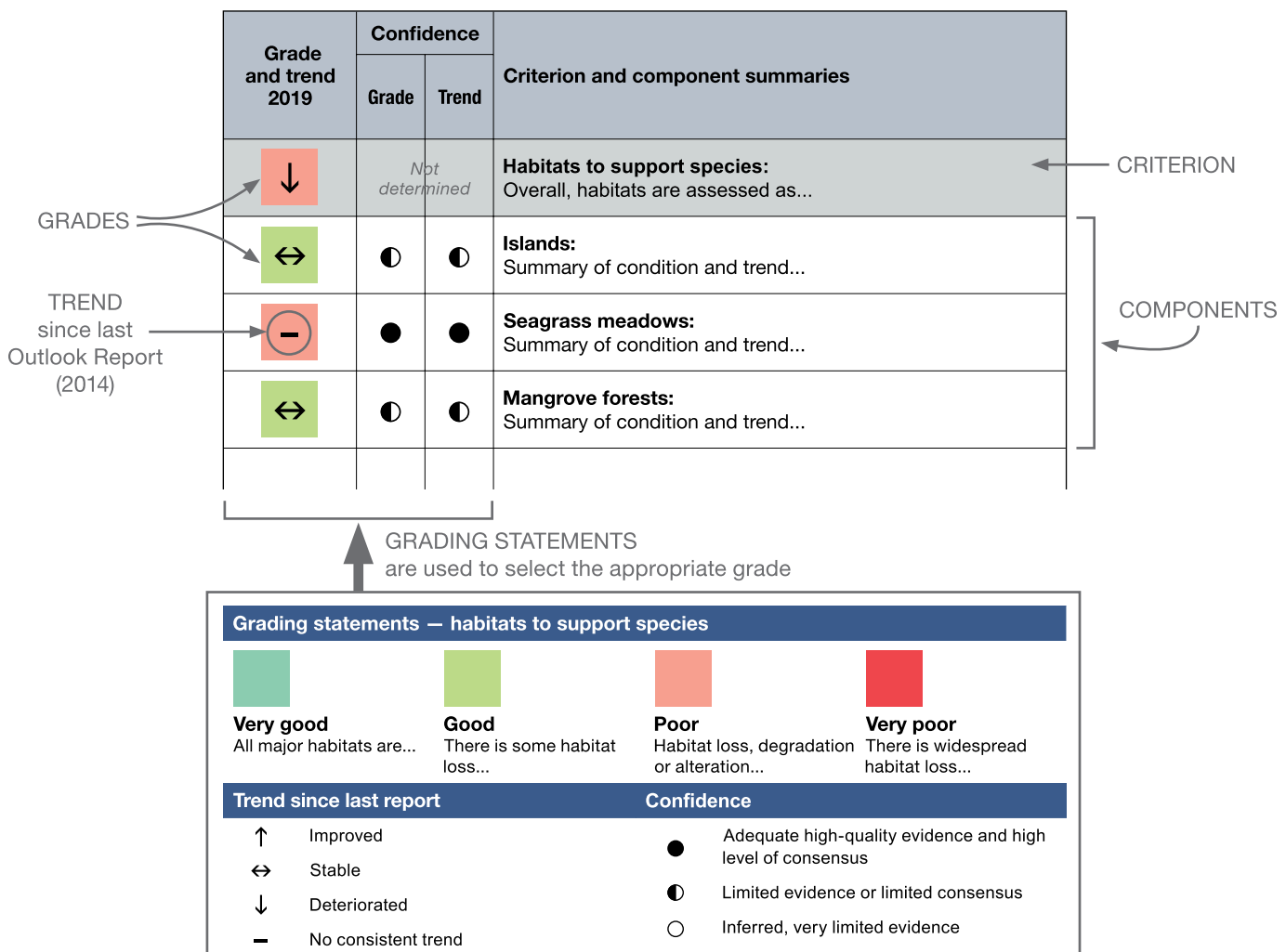


Figure 1.5 Grades for criteria are informed by grades for components

This figure shows an example extract from an assessment table for one of the biodiversity assessment criteria and illustrates the relationship between findings for a criterion and findings for its components. The grades for individual components (in this example, islands, seagrass meadows and mangrove forests) are key in informing the grade for the criterion (in this example, habitats to support species). Ultimately, both the criterion and component level assessments are guided by the relevant set of grading statements.

1.4.1 Assessment grades and grading statements

A series of grading statements standardise the allocation of grades for each criterion and all components examined in an assessment. A four-point grading scale has been used since 2009 and is continued for consistency. An example is shown in Figure 1.5. There is no option for ‘moderate’, so a decision is required about whether a component is in a positive or negative state. This application is consistent with the Australian State of the Environment Report.⁴

The grade allocated is a ‘grade of best fit’, based on a qualitative assessment of the available evidence and scaled to the Region (or Catchment for coastal ecosystems and coastal development). It is not a comparison of the Region in relation to other tropical ecosystems around the world. It is recognised that the condition grade of a component may not be consistent across the entire Region. Where there are important sub-regional differences in condition and trend that are supported by evidence (for example, corals), they are identified in the discussion and graphics within the main text of the chapter and considered in the grade and trend.

1.4.2 Trend and confidence

The grading is refined by including an indication of trend and confidence, similar to the Australian State of the Environment Report⁴. Trends are assessed in relation to the assessment of the component in the last Outlook Report (2014) as well as other available information on the trend in that component, if available. The trend reflects how the component has changed over the past five years. Previous grades (from 2009 and 2014) and trends (from 2014) are included in the assessment summary tables.

Chapters relating to factors that influence the Region's values, risks and long-term outlook contain forward-looking assessments. In these chapters (6, 9 and 10), trends in criteria and components are forecast for the next five years and beyond.

Four categories of trend are applied: improved, stable, deteriorated and no consistent trend. The category of 'no consistent trend' is applied to a component when the available information is too variable to determine a trend. The terms 'improved' and 'deteriorated' are replaced with 'increased' and 'decreased' in assessments of impacts, threats and risks (Chapters 6 and 9). Trends are not indicated for components that were not assessed in previous Outlook Reports.

Outlook Reports are evidence-based and peer-reviewed. To increase transparency and reliability in the current grades, a level of confidence is provided. The categories used are:

- adequate high-quality evidence and high level of consensus
- limited evidence or limited consensus
- inferred, very limited evidence.

For components where the confidence level is 'inferred, very limited evidence', the assessment grade should be treated with some level of caution given it is based on a limited amount of published peer-reviewed literature. Inferred assessments may also be based on knowledge from managing agencies, Traditional Owners, topic experts and informed stakeholders. Confidence levels are not provided for criteria assessments, as aggregating across components is difficult and there can be a high level of variability. A confidence level is also not provided for the assessment of existing protection and management (Chapter 7) because this assessment is conducted by independent reviewers and confidence levels are not currently part of that methodology.⁵

1.5 Evidence used

The Outlook Report contains brief background information on the Region, its ecosystem, heritage value, use and management, and the key evidence for the assessments required under legislation.

The information featured in this Outlook Report is only a small portion of all that is known about the Region. The evidence is derived from existing research and information sources from the past five years. The reporting period generally includes data from January 2014 to December 2018 and, where possible, compares it with historical trends. Evidence is drawn from the best available published science and data sets based on:

- relevance to the required assessments
- duration of study
- extent of area studied
- reliability (such as consistency of results across different sources, peer review and rigour of study).

Published peer-reviewed literature from technical experts is prioritised over other forms of evidence. Long-term data sets and peer-reviewed monitoring program reports are also considered highly persuasive evidence. Statistics from government-managed entities (for example, Australian Bureau of Statistics, Australian Maritime Safety Authority) are integral to the analyses in several chapters. Consultant reports may also be considered as part of the available evidence, but do not hold as much weight (particularly if not peer-reviewed). In some cases, information that became available in early 2019 has been included, where it was considered to make a significant difference to a key finding of the Outlook Report. Sources for the evidence used in each chapter are cited in the text. Web addresses provided in the report's reference list were correct at the time of writing. Despite the volume of information available, many aspects of the Region — its values, uses and threats, in particular cumulative effects — remain poorly understood. Significant information gaps⁶ are noted in the text.

The Outlook Report is based on the best available evidence

1.6 Terminology

Studies used in this Outlook Report vary in the spatial scales they cover. While only one grade is given for the Region, information available about a component (for example, seagrasses) may differ on a regional scale. The report attempts to discuss and summarise regional differences in condition and trend — however, there is no standard way of dividing up the Region when interpreting the data. Where evidence covers larger areas, for ease of reading and comparison, results are summarised into three sub-regional marine areas (or 'thirds of the Reef'): northern, central and southern. Their boundaries are not precisely defined, but the northern area extends from the tip of Cape York to approximately Port Douglas (which marks the division between the less-developed and developed catchments adjacent to the Region). The central area extends from the northern area south to the Whitsundays area. The southern area extends south of the Whitsundays area to the Region's southern boundary just north of Bundaberg. The term 'southern two thirds of the Region' is often used to describe the combined central and southern areas.

Great Barrier Reef Marine Park 'management areas' are sometimes used to describe the main zoning sections within the Region: Far Northern (or far north), Cairns–Cooktown, Townsville–Whitsunday and Mackay–Capricorn. Within the Catchment and inshore locations, sectors are described by natural resource management regions: Cape York, Wet Tropics, Burdekin, Mackay–Whitsunday, Fitzroy and Burnett–Mary.

The Region is defined by the Act, whereas the Catchment is managed by multiple jurisdictions and is not specifically defined by Queensland legislation. The Catchment (Figure 1.1) encompasses the 35 river basins flowing into the Region. Across the Region, the term 'inshore' may be applied differently for water quality, biodiversity and ecosystem health components. Inshore areas broadly correspond to enclosed coastal water bodies adjoining inter-tidal areas and habitats adjacent to the coast, and inshore from mid-shelf reefs. Areas beyond are generally referred to as 'offshore'. For coral reefs, the term 'outer shelf' refers to reefs along the edge of the continental shelf and 'mid-shelf' refers to reefs between inshore areas and the outer shelf.

1.7 Developing the report

This Outlook Report has been prepared by the Marine Park Authority, with contributions of evidence from a number of Australian and Queensland Government agencies, researchers from a range of institutions, industry data-holders and Traditional Owners.

The outcomes of an expert elicitation workshop⁷, involving more than 30 scientists and other stakeholders, contributed to the biodiversity, ecosystem health and heritage value assessments (Chapters 2, 3 and 4). The outcomes also informed the forward-looking risk and resilience assessments (Chapters 8 and 9). The methodology for the expert elicitation workshop was modelled on similar workshops used for previous Outlook Reports.²

Five independent experts specialising in protected area management, monitoring and evaluation, public policy and governance assessed the effectiveness of existing protection and management arrangements for the Region's ecosystem and its heritage value and, where relevant, the Catchment⁵. This independent assessment of management effectiveness also incorporated evidence from structured stakeholder interviews. The assessment identified gaps, improvements and deficiencies, and produced a comparative analysis with the 2009 and 2014 assessments. An additional synthesis report was developed to provide insights into the Reef 2050 Plan's contributions to effective management of the Region. The assessors' reports^{5,8} form the basis of the assessment of existing measures to protect and manage the Region (Chapter 7).

Four expert reviewers, appointed by the Australian Minister for the Environment, independently reviewed the draft Outlook Report. These reviewers are recognised national and international experts with biophysical, heritage and/or socio-economic expertise and achievements, including conducting high-level policy and scientific reviews. Their comments were considered and incorporated into the final report.



Herbivorous surgeonfish forage on a reef flat. © Matt Curnock 2015

Reef 2050 Long-Term Sustainability Plan

In 2015, the Australian and Queensland governments released the Reef 2050 Long-Term Sustainability Plan (Reef 2050 Plan)⁹ following extensive consultation with Traditional Owners, stakeholders and scientists. A mid-term review updated the plan in 2018 to incorporate revised water quality targets and stronger recognition of climate change as a key pressure.⁹

The Reef 2050 Plan marks a shift in how the Australian and Queensland governments and their partners collaborate in addressing challenges that the Reef is currently facing. For the first time, all key partners are working together to build on the management foundations laid over the past 40 years. The plan was developed in response to the World Heritage Centre's request for a coordinated and long-term plan for the sustainable management of the Reef.

The Reef 2050 Plan articulates a 35-year strategy to protect and improve the components and attributes that contribute to the Reef's outstanding universal value through a robust scientific adaptive management framework. It focuses improvement actions under seven themes: ecosystem health, biodiversity, heritage, water quality, community benefits, economic benefits and governance. These themes were influenced by the Outlook Report 2014. Similarly, the Outlook Report 2019 will inform a review of the Reef 2050 Plan in 2020.

To support the implementation of the Reef 2050 Plan, an investment framework¹⁰ was developed in 2016 to guide investment decisions for the delivery of Reef 2050 Plan actions. The revised Reef 2050 Plan identifies priorities for immediate attention and new actions to protect the values of the Reef and improve the Reef's resilience. It reaffirms the importance of a strong, coordinated approach to managing the Reef.

