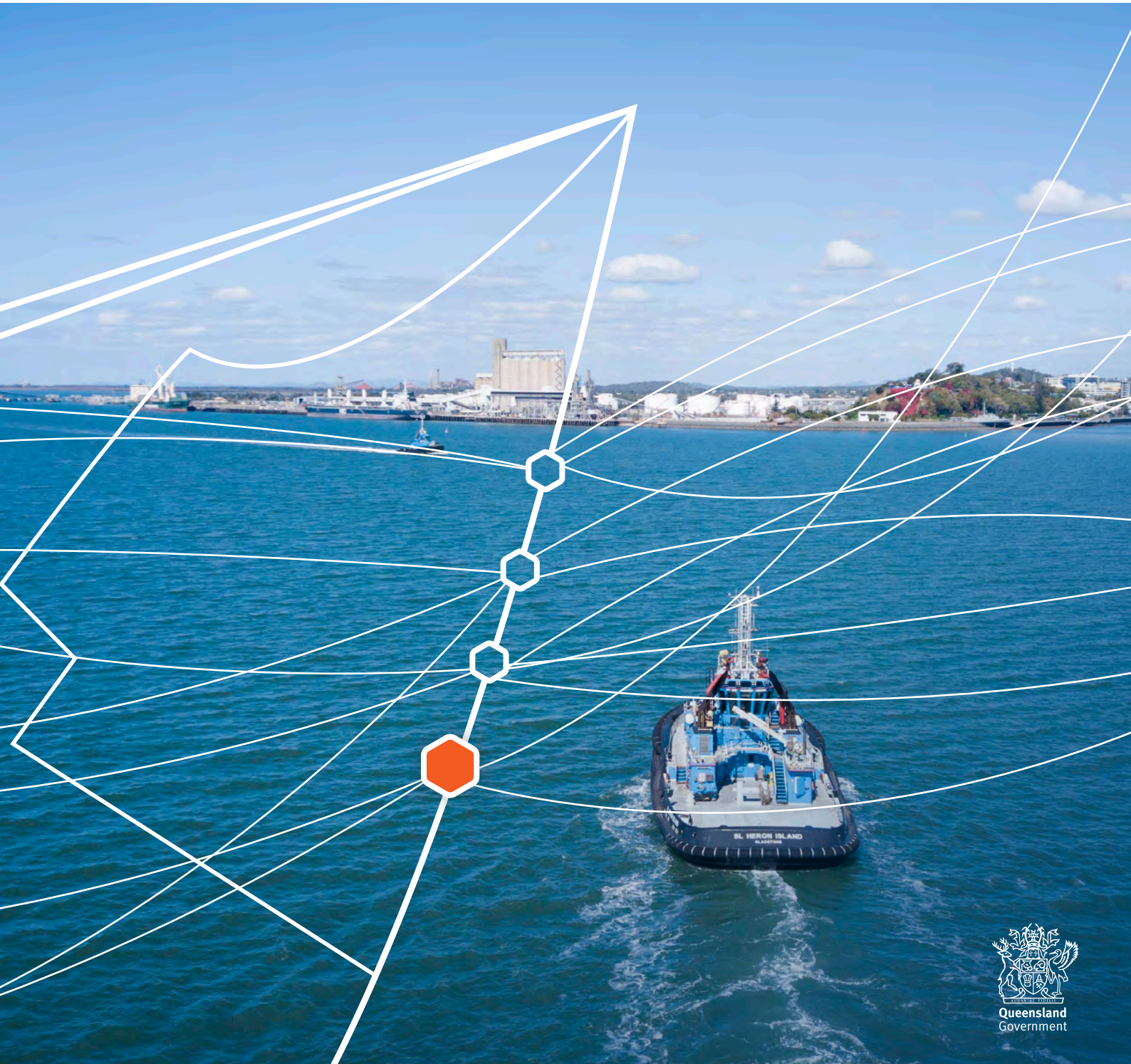
Priority port master planning

Master plan
Priority Port of Gladstone

Queensland | Australia | 2018



Queensland Government

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Achieving sustainable development and managing cumulative impacts on the Great Barrier Reef is a challenging task, but with careful planning and community commitment, we can work together to get the balance right.

Foreword

One of the Queensland Government's commitments in *Our Future State: Advancing Queensland's Priorities* is to 'Protect the Great Barrier Reef'. From banning single use plastic bags to limiting port development and dredging, there are a number of key initiatives to manage threats to the Great Barrier Reef and protect its Outstanding Universal Value (OUV).

The release of this master plan and master planned area for the priority Port of Gladstone is an Australian first for the Great Barrier Reef World Heritage Area (GBRWHA) and an important milestone. It is a major step forward for the Queensland Government's port-related actions in the *Reef 2050 Long-Term Sustainability Plan* (Reef 2050 Plan).

Not only does the master plan drive economic development in and around Gladstone's port, but it also outlines potential port development impacts and solutions on the GBRWHA for the next three decades and later generations. The plan provides for the management of port-related impacts, identifies areas for environmental protection, and ensures the Reef's OUV is considered in port planning and management.

The *Sustainable Ports Development Act 2015* (Ports Act) was introduced as an outcome of the Reef 2050 Plan and mandates the preparation of master plans and port overlays for the priority ports of Gladstone, Townsville, Hay Point/Mackay and Abbot Point.

The Ports Act and master planning responds to UNESCO World Heritage Committee recommendations for the OUV of the Great Barrier Reef.

The Act restricts capital dredging, prohibits sea-based disposal of capital dredged material within the GBRWHA and mandates its beneficial reuse.

The plan provides for the management of port-related impacts, identifies areas for environmental protection, and ensures the Reef's Outstanding Universal Value is considered in port planning and management.

The master plan for the priority Port of Gladstone was finalised after consultation with key stakeholders including Gladstone Ports Corporation, Gladstone Regional Council, government agencies, industry and community and environmental groups.

This plan sets the strategic vision for the master planned area until 2050. It supports the development of the port and port-related industry in a sustainable way. It highlights the importance of optimising existing infrastructure and cargo handling, efficient land use, and capital and maintenance dredging. The plan has been prepared using an evidence-based approach.

Achieving sustainable development and managing cumulative impacts on the Great Barrier Reef is a challenging task, but with careful planning and community commitment, we can work together to get the balance right.

Overview

The master plan for the priority Port of Gladstone, prepared in accordance with the *Sustainable Ports Development Act 2015*, is a significant milestone in the delivery of Queensland's commitments in the *Reef 2050 Long-Term Sustainability Plan* (Reef 2050 Plan).

The strategic vision for the future of the master planned area is:

'The master planned area for the priority Port of Gladstone will enable Queensland's largest multi-commodity port and associated industrial area to develop in a sustainable manner. Development will provide for management of the local expression of the Outstanding Universal Value of the Great Barrier Reef World Heritage Area, and any potential impacts on environmental values, community wellbeing and cultural heritage within and surrounding the master planned area.'

Queensland's largest multi-commodity port

The priority Port of Gladstone is Queensland's largest multi-commodity port and the fourth largest coal export terminal in the world (by throughput). It is critical to the state's economy, handling more than 30 products and transporting to more than 30 countries.

The strategic vision acknowledges the port is a major driver of economic growth. The port underpins the growth and prosperity of the Fitzroy region, Central Queensland and beyond. It has national significance as one of the few naturally sheltered and deep water ports on the east coast of Australia.

There is a significant opportunity for the priority Port of Gladstone to continue to develop as a logistics hub for both the import and export of a wide variety of commodities.

Protecting the Great Barrier Reef

The priority Port of Gladstone operates in the Great Barrier Reef World Heritage Area (GBRWHA). The master plan establishes a strategic and coordinated approach that ensures the Outstanding Universal Value (OUV) of the GBRWHA is an intrinsic consideration in the management of port-related development. This approach complements other initiatives being undertaken by government to manage port

operations and development within the GBRWHA.

The master planned area does not designate any new industrial land outside of the established Gladstone State Development Area, strategic port land or other existing operating industry, and identifies areas with environmental values where development should be limited.

The master plan identifies environmental values within and surrounding the master planned area, including those that contribute to the OUV of the GBRWHA. It identifies objectives and measures for managing potential impacts on environmental values and recognises the comprehensive regulatory system that operates within Queensland.

The master plan provides a direct line of sight from international conventions and national policies, and how this is considered through the state, regional and local regulatory instruments to influence site-specific management.

Promoting economic development

The master planned area encompasses the entire Gladstone State Development Area—a defined area of land dedicated for industrial development and supporting land uses—as well as supply chain networks connecting industry to the port. The master planned area encompasses land and marine areas considered important for the efficient development and operation of the port and associated supply chain infrastructure to support economic activities.

The master planned area is divided into specific precincts to guide where port-related development can be established and expanded to capitalise on investment opportunities.

Managing sustainable growth

The efficient use of the integrated port and supply chain infrastructure network is critical to support sustainable ongoing growth, as well as providing positive outcomes for the OUV of the GBRWHA and other environmental values. The master plan is consistent with both the Reef 2050 Plan and the *Independent Review of the Port of Gladstone* which recognise the importance of port optimisation in managing port-related development within the GBRWHA.

The master plan identifies the importance of other matters in managing the growth of the port including the interface with adjacent urban areas and ongoing dredging requirements. The master plan reaffirms restrictions on capital dredging and prohibitions on sea-based disposal of capital dredged material.

Integrated freight transport network

The efficient movement of freight between producers and customers is vital for the sustainable growth of the region's economy. The master plan recognises that the port forms a critical component of the freight network that moves goods throughout the region and connects to national and international markets.

Implementation

The master plan is a strategic document implemented through a separate port overlay. The port overlay provides regulatory effect for the master plan by setting requirements delivered through existing planning instruments that regulate development within the master planned area.

Additional regulation through the port overlay to guide port-related development outcomes is only provided where necessary to deliver the outcomes of the master plan. This recognises the outcomes sought by the master plan are mostly achieved through existing provisions and reduces duplication.

Introduction

The master plan for the priority Port of Gladstone has been prepared under the *Sustainable Ports Development Act 2015* (Ports Act), a significant milestone in the delivery of Queensland's commitments under the *Reef 2050 Long-Term Sustainability Plan* (Reef 2050 Plan).

Through master planning, the Queensland Government has established a long-term vision for future development at the Port of Gladstone, consistent with the principles of ecologically sustainable development (ESD). This ensures the Outstanding Universal Value (OUV) of the Great Barrier Reef World Heritage Area (GBRWHA) is an intrinsic consideration in managing port-related development.

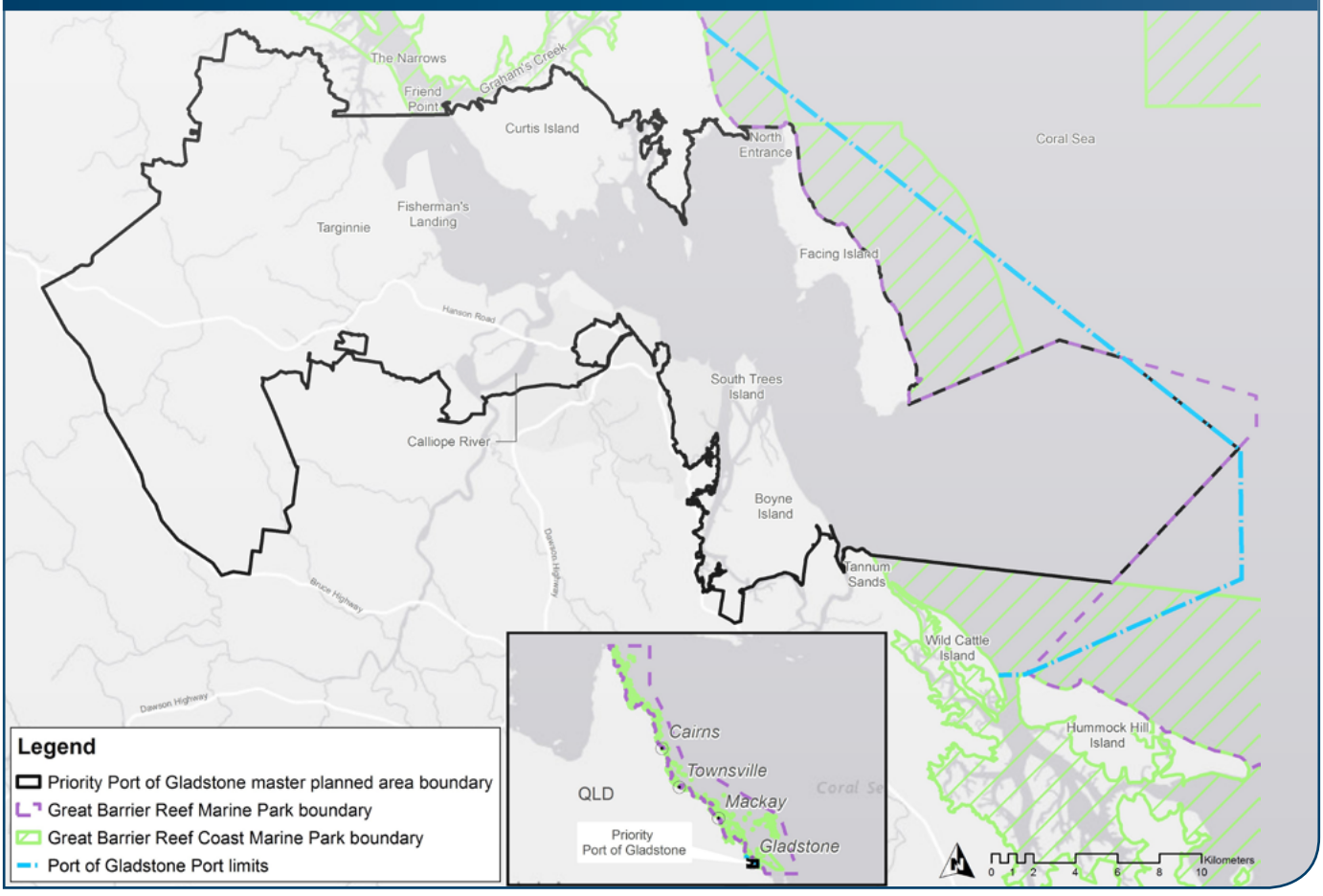
Master planning provides a strategic and coordinated approach, considering issues beyond planning for strategic port land (SPL), including potential marine and land-based development impacts, port and supply chain infrastructure capacity and connectivity, and economic, community and environmental interests. The master planned area includes land-based and marine areas shown in **Figure 1** and in the regulation map in **Appendix A**.

These areas were determined through an evidence-based review of the region and a comprehensive consultation process. This took account of land uses, regulations, environmental, social and cultural values and other factors that have potential to influence the development of the master planned area.

What is a master plan?

A master plan for a Queensland priority port is a strategic document with a long-term outlook for the sustainable development of port and port-related activities through to 2050. The master plan for the priority Port of Gladstone sets a long-term planning focus to address operational, economic, environmental and community relationships within the master planned area. The master plan considers supply chains, infrastructure optimisation and surrounding land uses, and ensures the OUV of the GBRWHA is an intrinsic consideration in managing port-related development.

Figure 1 – Priority Port of Gladstone locality plan



Master plan at a glance

The master plan for the priority Port of Gladstone contains several parts outlining the background, vision, spatial extent, environmental management framework (EMF) and implementation of the master plan.

Part A – Context: identifies the strategic importance, role and function of the Port of Gladstone and key considerations for the management of sustainable growth of the port and port-related industry in the master planned area.

Part B – Strategic vision, objectives and desired outcomes: states the long-term vision of the master planned area that considers the capacity for growth in consideration of the principles of ESD, and outlines objectives and desired outcomes which clarify how the strategic vision will be achieved.

Part C – Master planned area and precincts: identifies the master planned area and the master planned area precincts. These precincts relate to the port-related development intent for the master planned area.

Part D – Environmental management framework: identifies the environmental values within the master planned area and surrounding areas (refer to Appendix B for associated mapping), identifies potential impacts, and outlines the objectives and measures for the management of potential impacts on environmental values.

Part E – Master plan implementation: outlines the implementation of the master plan through the existing regulatory framework and a separate port overlay instrument.

Appendix A – Priority Port of Gladstone master planned area: provides the regulatory map of the master planned area and detailed precinct maps.

Appendix B – Mapping of the OUV of the GBRWHA and other environmental values: provides consolidated mapping of the environmental values within and surrounding the master planned area, including values that contribute to the OUV of the GBRWHA.

Appendix C – Local attributes that contribute to the OUV of the GBRWHA: details the attributes and associated environmental values locally expressed in the master planned area and surrounding areas, and their contribution to the OUV of the GBRWHA.

Appendix D – Potential impacts on environmental values: outlines the potential impacts on environmental values as a result of development in the master planned area, and the precincts to which they are relevant.

Appendix E – EMF objectives: outlines objectives for each master planned area precinct to avoid, mitigate and/or offset potential impacts from development on environmental values, including the OUV of the GBRWHA, matters of national environmental significance and matters of state environmental significance.

Appendix F – Definitions: provides a table of definitions relevant to the master plan.

Appendix G – Abbreviations and acronyms: provides a table of abbreviations and acronyms used in the master plan.

Appendix H – References: provides a list of references relevant to the master plan content.

Why is there a master plan?

The Queensland Government is implementing master planning for the priority ports of Gladstone, Townsville, Hay Point/Mackay and Abbot Point in accordance with the Ports Act, and to meet its commitments under the Reef 2050 Plan.

Reef 2050 Long-Term Sustainability Plan

In 2015, the Australian and Queensland governments released the Reef 2050 Plan, providing an overarching framework to secure the health, resilience and OUV of the GBRWHA, including a number of key port-related commitments.

The commitments involved restricting capital dredging to the four priority ports, prohibiting sea-based disposal of capital dredged material from port-related development, and mandating the beneficial reuse of port-related capital dredged material. Specific to Gladstone, this included protection of the Fitzroy Delta and application of the best practice principles identified in the *Independent Review of the Port of Gladstone*.

A mid-term review of the Reef 2050 Plan in 2018 monitored the government's progress in meeting its commitments, recognising the introduction of the Ports Act as a key policy response to managing port development in the GBRWHA.

The Reef 2050 Plan's vision is:

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

The updated Reef 2050 Plan outlines one master planning port-related action (MTR EBA9) which relates to completing master planning for priority ports in accordance with the Ports Act.

Independent Review of the Port of Gladstone

At the 2012 meeting of the United Nations, Educational, Scientific and Cultural Organization (UNESCO) World Heritage Committee, it was requested:

'…an Independent Review of the management arrangements for Gladstone Harbour, that will result in the optimization of port development and operation in Gladstone Harbour and on Curtis Island, consistent with the highest internationally recognized standards for best practice commensurate with iconic World Heritage status'.

In accordance with this recommendation the *Independent Review of the Port of Gladstone* (Independent Review) was commissioned by the Australian Government in 2013 to examine the environmental management arrangements and governance of the Port of Gladstone. An important outcome of the Independent Review was a broader examination of the potential economic growth and subsequent port developments along the Queensland coast and adjacent to the GBRWHA.

The Independent Review recommended a single master plan be developed for the whole of the Port of Gladstone, including SPL and the Gladstone State Development Area (GSDA), and the Queensland Government and Gladstone Ports Corporation delineate between the Port of Gladstone and Port Alma.

The Independent Review outlines best practice principles for port planning within and adjacent to the GBRWHA, including port optimisation through the consolidation and sharing of infrastructure.

Sustainable Ports Development Act 2015

The Ports Act provides a legislative framework for sustainable port planning and development in Queensland. The Ports Act implements a number of Queensland Government port-related commitments and actions made under the Reef 2050 Plan in 2015, and responds to UNESCO World

The master plan is consistent with the *Independent Review of the Port of Gladstone* by applying the best available evidence-based knowledge in relation to environmental, cultural, social and economic interests. The master plan identifies specific environmental values that contribute to the OUV of the GBRWHA and also identifies environmental objectives and priority management measures. The master planned area includes all SPL and the entire GSDA and reaffirms the government's commitment to protecting the Fitzroy Delta.

The master plan recognises the importance of port optimisation and provides examples of how this can be applied through planning processes and aligns with regional, state and national port and freight logistics plans. The precinct approach supports optimisation and ensures OUV is an intrinsic consideration in port planning, management and governance. The precincts identify areas potentially suitable for development, as well as areas of environmental value where development should be limited. The master plan aligns with the principles of transparency and public availability of information. The master plan will be reviewed at least every 10 years, consistent with the Ports Act and Independent Review principles.

Heritage Committee recommendations on the reef, ensuring the OUV of the GBRWHA is an intrinsic consideration in future port development.

A mid-term review of the Reef 2050 Plan in 2018 monitored the government's progress in meeting its commitments, recognising the introduction of the Ports Act as a key policy response to managing port development in the GBRWHA.

The Ports Act manages the cumulative impact of port development on the Great Barrier Reef by limiting port development across the GBRWHA to four priority ports. Master planning for each priority port establishes a strategic and coordinated approach by constraining port-related development and capital dredging to a defined master planned area and ensuring potential impacts on environmental values are managed.

The purpose of the Ports Act is to provide for the protection of the GBRWHA through the management of port-related development in and adjacent to the area. This is achieved through the following measures:

- concentrating port development in the GBRWHA to the priority ports
- mandating the preparation of master plans and port overlays for each priority port to establish a long-term vision for future port development
- restricting capital dredging for the development of new or expanded port facilities to within regulated port limits of the priority ports
- prohibiting sea-based disposal of capital dredged material from port-related development within the GBRWHA and Commonwealth and state marine parks
- mandating the beneficial reuse of port-related capital dredged material.

The Ports Act provides requirements for the content of the master plan which include:

- identification of the state interests affected, or likely to be affected, by existing uses at the port and future development at, or for, the port
- a long-term strategic vision, objectives and desired outcomes for the master planned area
- an EMF that states objectives and priority management measures (PMMs) for managing development impacts on environmental values in the master planned area.

The Ports Act requires that the master plan must adequately consider the principles of ESD.

How is the master plan implemented?

The master plan is a strategic document implemented through the port overlay for the master planned area. The port overlay provides regulatory effect for the master plan under the Ports Act to ensure the strategic vision, objectives, desired outcomes, state interests and EMF are achieved.

Master planning recognises the autonomy of decision making for existing planning and regulatory entities within the master planned area, and the port overlay operates within the existing planning instruments. The port overlay does not modify decision making for existing regulatory entities in relation to the respective planning instruments and environmental legislation.

Figure 2 provides an overview of the existing regulatory planning framework within the master planned area and the relevant regulatory instrument for implementation of the master plan through the port overlay.

Additional regulation through the port overlay will only occur where a gap or inconsistency is identified in the existing regulatory framework impacting the delivery of master plan outcomes. This recognises the outcomes sought by the master plan are in many cases already achieved through existing provisions and reduces duplication. The master plan complements the existing regulatory system and does not replicate, replace or remove any existing processes.

Figure 3 illustrates the relationship of the state interests, strategic vision, objectives, desired outcomes, and EMF (which includes objectives and PMMs) within the master plan, and how they are implemented through the port overlay.

The Ports Act requires that the master plan is reviewed every 10 years. Due to the long-term planning horizon, and to provide for an adaptive management approach, the master plan can be reviewed outside of this mandatory period to respond to major changes in policy or legislation, where appropriate. Outcomes from a master plan review will be considered further through the port overlay and other planning instruments in the master planned area.

Figure 2 – Implementation of the port overlay within the current planning instruments framework

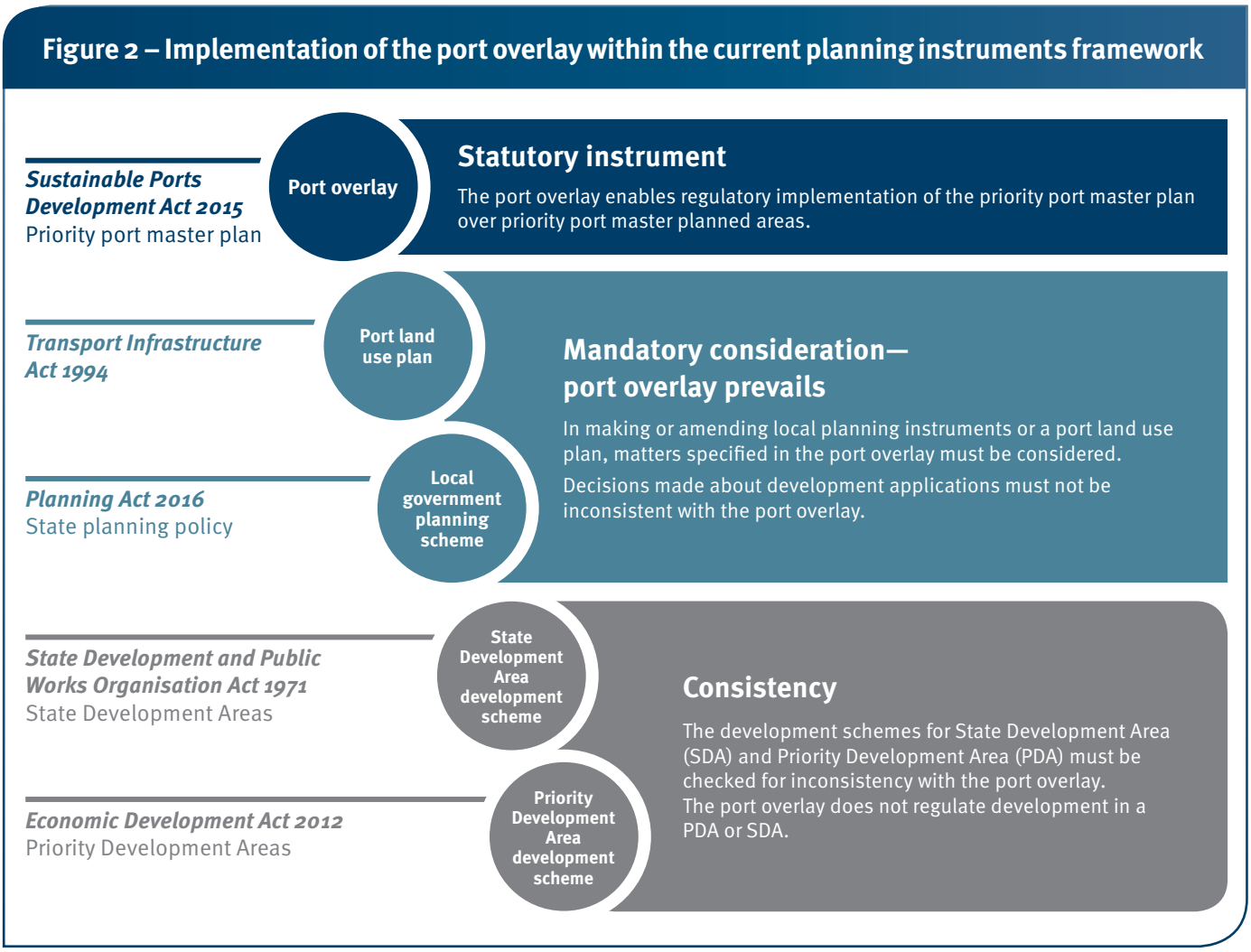
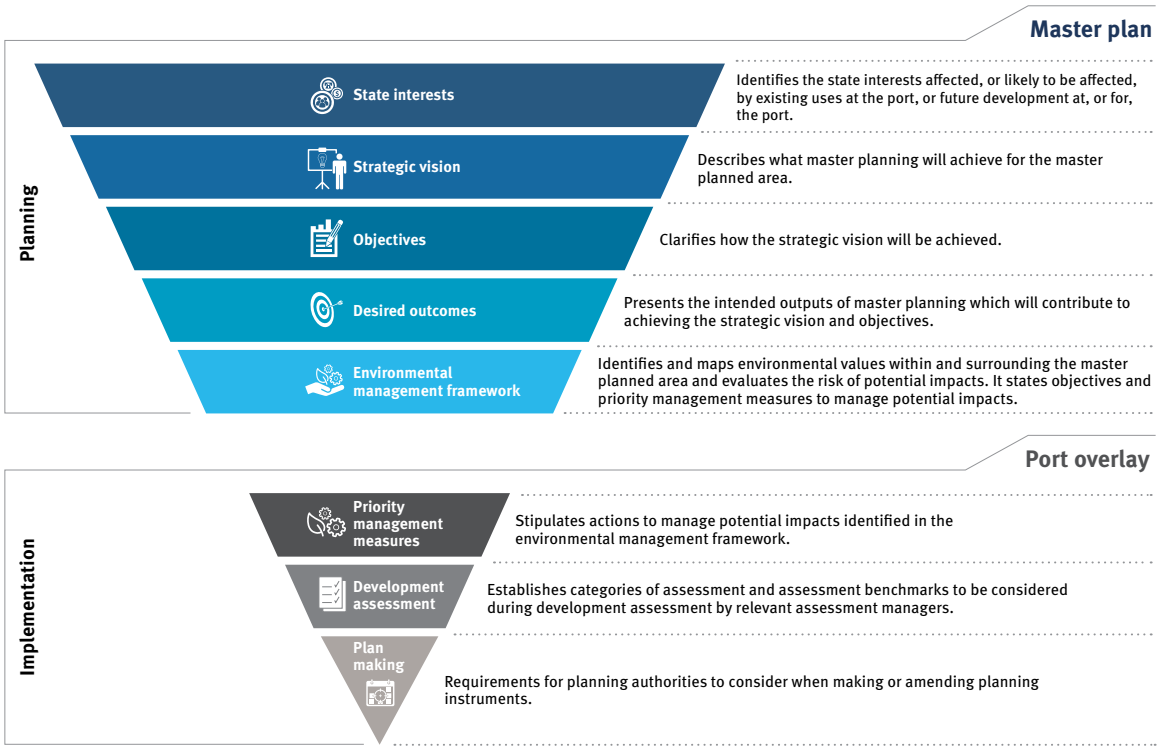


Figure 3 – Elements of the master planning process



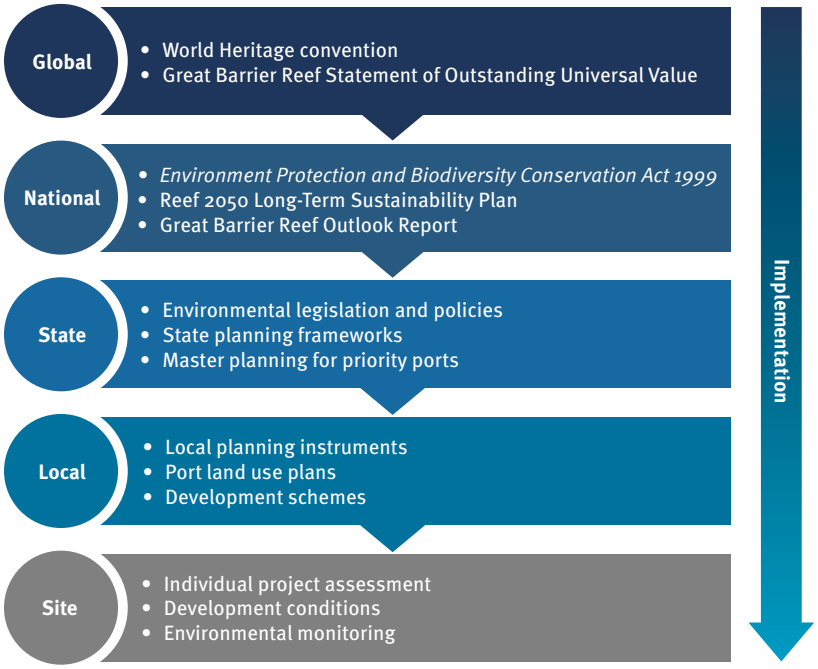
Regulating port operations

Queensland's ports operate within a regulatory framework and must satisfy a comprehensive number of local, state and Commonwealth government planning and other regulatory requirements. Master planning is one component of the regulatory and compliance framework in which ports operate.

Figure 4 provides an overview of how the existing regulatory system provides a direct line of sight from international conventions and national policies, and how this is considered through the state and local regulatory instruments to influence site-specific management.

The master plan complements this system and does not replicate, replace or remove any existing processes. The master plan does not commit government or other entities to particular projects and does not infer government approval of development.

Figure 4 – Planning from the international to the local level



Environmental assessment

State and Commonwealth environmental impact statement (EIS) assessment processes under the *Environmental Protection Act 1994* (EP Act), the *State Development and Public Works Organisation Act 1971* (SDPWO Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provide for rigorous assessment of major projects to ensure development occurs in a sustainable manner and unacceptable impacts on environmental values do not occur. This includes the appropriateness and acceptability of identified environmental management arrangements.

The EP Act also provides a framework for regulating environmentally relevant activities (ERAs) through a permit and licensing system. This system ensures ERAs manage, enhance or protect environmental values through conditions or enforcement processes.

The *Environmental Protection (Air) Policy 2008*, *Environmental Protection (Noise) Policy 2008* and *Environmental Protection (Water) Policy 2009* outline thresholds, indicators and objectives for enhancing or protecting environmental values, as well as providing a framework for consistent and informed decisions about managing ongoing environmental impacts.

State and local planning processes

State planning instruments, including the *State Planning Policy* (SPP) and regional plans, set out critical planning matters which guide local planning instruments to achieve development outcomes in each local government area. The SPP adopts the 'avoid-mitigate-offset' hierarchy embedded in planning and environmental legislation.

The *Planning Regulation 2017* identifies that certain development must also be assessed against the State Development Assessment Provisions to ensure impacts on matters including native vegetation, marine plants and fish habitat areas are subject to rigorous assessment and conditioning before commencing.

Priority Development Areas and State Development Areas promote economic development and growth by concentrating development in selected areas. This ensures efficient land use and infrastructure optimisation to manage environmental impacts in accordance with the avoid-mitigate-offset environmental hierarchy.

Land use plans under the *Transport Infrastructure Act 1994* have an important role in planning for port development on strategic port land by identifying where and how particular activities should occur.

Regulating development within the master planned area

There are a range of Queensland and Australian government controls that apply to the master planned area. All environmental legislative requirements will continue to apply to development proposals.

The following planning instruments currently provide assessment requirements which regulate development within the master planned area (also see **Figure 5**):

- the Gladstone Ports Corporation land use plan (GPC LUP) under the *Transport Infrastructure Act 1994*
- the Gladstone Regional Council planning scheme (GRC planning scheme) under the *Planning Act 2016*
- the Gladstone State Development Area Development Scheme (GSDA development scheme) under the *State Development and Public Works Organisation Act 1971*.

Gladstone Ports Corporation (GPC) will continue to be the assessment manager for development regulated by the GPC LUP for SPL within the master planned area.

Gladstone Regional Council (GRC) will continue to be the assessment manager for development regulated by the GRC planning scheme on land within the GRC local government area included in the master planned area. This includes residential areas currently subject to GRC's planning provisions.

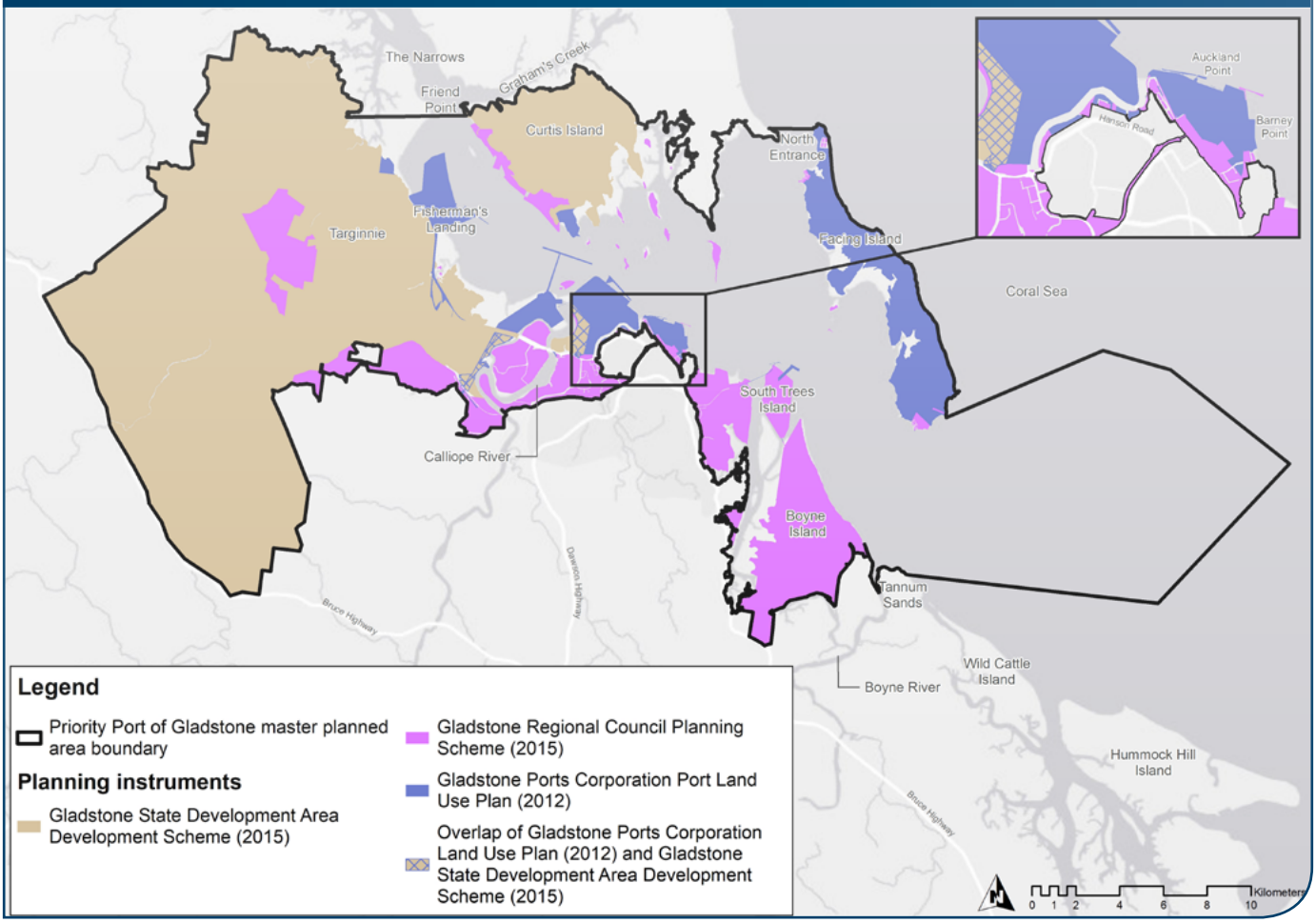
The Coordinator-General will continue to be the decision maker for development within the GSDA regulated by the GSDA development scheme.

The relevant regulatory entity for assessable development within marine areas, where GRC, GPC or the Coordinator-General is not the assessment manager or decision maker, will continue to be the assessment manager as defined under the *Planning Regulation 2017*.

By including land and marine areas within multiple planning jurisdictions in the master planned area, the master plan achieves the purpose of the Ports Act, the findings of the Independent Review and actions of the Reef 2050 Plan. It also supports government commitments relating to the coordination and optimisation of infrastructure.

Figure 5 illustrates the spatial jurisdiction[1] of each of the existing planning instruments within the master planned area.

Figure 5 – Existing planning instruments within the master planned area



[1] There are some instances where planning instruments spatially overlap. Where this occurs, the assessment manager may change depending on the type of development proposed. Individual planning instruments should be referred to when determining assessment requirements.

Related policy initiatives

There are a number of policy initiatives and projects linked with master planning for the priority Port of Gladstone, across all levels of government. The master plan does not seek to amend these policies but recognises the important role each of these initiatives play in the ongoing sustainable development of the port. These initiatives highlight the significance of the port, supply chain infrastructure and port-related development in Gladstone and the importance of managing environmental values.

Australian Government

Australian Infrastructure Plan

The *Australian Infrastructure Plan*, prepared by Infrastructure Australia in 2016, seeks to identify infrastructure reforms and investments required to manage population growth, the Asia-Pacific's growing demand for Australian goods and services, and environmental challenges. The plan aims to maximise the potential of fast-growing regions like Gladstone to boost productivity and promote careful regional planning.

In addition to the plan, Infrastructure Australia also released an Infrastructure Priority List which identifies the Gladstone Port land and sea access upgrade as a priority initiative. This GPC proposed initiative includes a range of potential projects relating to infrastructure upgrades, which may be considered by government and industry as the need arises.

National Freight and Supply Chain Strategy

Following the Inquiry into National Freight and Supply Chain Priorities in 2018, the Council of Australian Governments' Transport and Infrastructure Council agreed to a framework for developing a National Freight and Supply Chain Strategy. The strategy will build on the outcomes of the inquiry and outline an integrated, national approach for the movement of goods to ensure freight systems and infrastructure work across state and territory borders. The Transport and Infrastructure Council is working with state, territory and local governments to implement the strategy from 2019.

National Ports Strategy

The *National Ports Strategy*, prepared by Infrastructure Australia in 2011 and endorsed by the Council of Australian Governments in 2012, recognises the important economic role of ports and related freight supply chains, and developing long-term integrated master plans for ports guided by leading practice and supported by various levels of planning. The master plan is a key document to implement the recommendations of the *National Ports Strategy* relevant to Gladstone.

North-East Shipping Management Plan

The *North-East Shipping Management Plan* was prepared in 2014 by the Australian Maritime Safety Authority to demonstrate how shipping is managed in sensitive marine environments and propose actions to minimise environmental impacts on the OUV of the GBRWHA, ensure safety and manage shipping traffic increases. The North-East Shipping Management Group, including both Australian and Queensland government agencies, implements the actions on an ongoing basis.

White Paper on Developing Northern Australia

Gladstone is defined as part of Northern Australia in accordance with the *Northern Australia Infrastructure Facility Act 2016*. Released in 2015, *Our North, Our Future: White Paper on Developing Northern Australia* provides a vision and an economic development plan to unlock the economic potential of Northern Australia which is based on proximity to Asia, enhanced international trade opportunities and national security.

Queensland Government

Central Queensland Regional Plan

The *Central Queensland Regional Plan* (CQRP), released in 2013, provides strategic direction and policies to deliver regional outcomes which align with the state's interests in planning and development. It outlines policy responses to resolve the region's most important issues affecting its economy and liveability of its towns, including supporting co-existence opportunities for the agricultural and resources sectors, safeguarding areas for the growth of towns, and describing the region's priority infrastructure outcomes.

The CQRP recognises Gladstone's key role as a transport and processing hub for the region and adjoining regions. The Port of Gladstone and its linkages to the Surat and Bowen basins is identified as a significant contributor to the state and national economies.

Maintenance Dredging Strategy for the Great Barrier Reef World Heritage Area Ports

The *Maintenance Dredging Strategy for Great Barrier Reef World Heritage Area Ports* (Maintenance Dredging Strategy), released in 2016, provides for sustainable, leading practice management of maintenance dredging. Under the Maintenance Dredging Strategy, GPC is required to develop a Long-term Maintenance Dredging Management Plan (LMDMP) which reflects the *Guidelines for Long-term Maintenance Dredging Management Plans*.

The preparation of a LMDMP will demonstrate a robust long-term approach to the planning, consultation, monitoring and reporting of maintenance dredging activities. The plan offers an avenue for continued improvement in maintenance dredging management, environmental performance, transparency and accountability.

Our Future State: Advancing Queensland's Priorities

The Queensland Government has committed to 'Protect the Great Barrier Reef' as one its key priorities identified in *Our Future State: Advancing Queensland's Priorities*. Protecting the environmental, social, and economic value of the Great Barrier Reef drives many of the Queensland Government's environmental policies and activities, including priority port master planning.

Ports Air Emissions Project

The Department of Transport and Main Roads is undertaking a Ports Air Emissions Project to provide further guidance about the air emission impacts of ports, industrial activity associated with ports and future development of land around ports.

The project is being undertaken in partnership with the Department of Environment and Science and is guided by a steering committee of relevant government partners and port authorities. The outcomes of this project will help inform future decisions about the siting of development in close proximity to port areas.

Queensland Transport and Roads Investment Program

The *Queensland Transport and Roads Investment Program* (QTRIP) outlines the investment program for transport infrastructure in Queensland to deliver a single integrated transport network accessible for everyone. The 2018–19 to 2021–22 program outlines a range of initiatives for the Fitzroy Region, including planning for stage two of the Gladstone Port Access Road.

Queensland Tourism and Transport Strategy

The *Queensland Tourism and Transport Strategy* was jointly prepared by the Department of Transport and Main Roads and the Department of Innovation, Tourism Industry Development and the Commonwealth Games in 2018. The strategy considers visitors' needs across all modes of transport including drive, cruise, long distance and local transport and aviation transport priorities—with particular focus on key tourism destinations and major population centres.

Smarter Solutions: Network Optimisation Framework

The Queensland Government's *Smarter Solutions: Network Optimisation Framework* prioritises the consideration of low cost and non-infrastructure solutions within the planning and investment process.

The framework encourages network optimisation solutions to ensure the existing transport network and infrastructure is optimised before major investment. In certain situations this may be able to generate similar outcomes to new infrastructure, reducing or delaying the need for significant capital expenditure and potential environmental impacts that may arise from new development.

State Infrastructure Plan

The *State Infrastructure Plan* outlines the Queensland Government's strategic direction and provides a framework to guide Queensland Government agencies in the planning, prioritisation and delivery of infrastructure in Queensland. Part A of the plan identifies challenges and objectives and outlines the Queensland Government's responses to these challenges. Part B of the plan outlines the government's four-year program for potential future investments in immediate and longer-term projects, which will be informed by the independent advice of Building Queensland.

Building Queensland provides the Queensland Government with independent, expert advice on major infrastructure. Building Queensland works closely with all departments, government-owned corporations and statutory authorities to guide better infrastructure decision-making.

State Planning Policy

The SPP outlines the state interests[2] in land use planning and development that must be considered in every planning scheme across Queensland. The SPP recognises the importance of ports to the national and state supply chains and includes a state interest to protect the growth and support the development of strategic ports. The Port of Gladstone is identified as both a strategic and priority port under the SPP.

Transport Coordination Plan and draft Queensland Transport Strategy

The *Transport Coordination Plan 2017–2027* (TCP) released in October 2017 brings a contemporary approach to the coordinated planning and management of transport, including a strong focus on customer needs and technology. The TCP provides a strategic framework for the planning and management of transport resources in Queensland for the next 10 years. Further, the TCP includes a specific objective for transport to facilitate the efficient movement of people and freight to grow Queensland's economy and includes a commitment to focus on improving connectedness along key freight corridors in regional areas. The TCP will be complemented by a yet to be released draft *Queensland Transport Strategy* (QTS).

The draft QTS is intended to be a future-focused, whole-of system transport strategy based around strategic customer outcomes and objectives from the TCP. The QTS will guide how the Department of Transport and Main Roads (TMR) responds to future change and position Queensland to respond to and maximise the benefits from transformational changes over the long term, and ensure our future transport system continues to meet customer needs. Both of these overarching documents will recognise the pivotal role that ports and freight supply chains play in supporting the state's economy—connecting Queensland industries with domestic and international markets.

[2] State interests included in the SPP are defined under the *Planning Act 2016*. Separate state interests are defined under other legislation including the *Economic Development Act 2012* and the Ports Act.

Local government

Gladstone Region Economic Development Strategy

The *Gladstone Region Economic Development Strategy* was released in 2015 to set out a framework for guiding future economic growth and continuing the economic evolution of the Gladstone region. The strategy identifies a vision for economic development, economic objectives and the competitive advantages of the Gladstone region. These advantages and economic assets include the Port of Gladstone, the region's strategic location to natural resources across Central Queensland, strong supply chains and the GSDA.

State interests

State interests[3] under the Ports Act are matters that are affected, or likely to be affected, by existing uses of the master planned area, and future development at, or for, the port. State interests will be consistently applied across the master planned area to implement the master plan.

The master planning process has been conducted with a focus on identifying, balancing and delivering on the interests of the state in port-related development within the master planned area. The state interests have been informed by the policy context and regulatory framework described in the sections above.

State interests defined under other legislation will still apply to the master planned area.

[3] State interests are defined under the Ports Act. Separate state interests are defined under other legislation including the *Planning Act 2016* and the *Economic Development Act 2012*. These still apply to the master planned area.

Part A: Context

Gladstone and its port

Gladstone: port city

The Port of Gladstone is located 525 kilometres north of Brisbane (refer **Figure 1**). The port is just south of the Tropic of Capricorn at latitude 23°49.61´S, longitude 151°34.6´E, immediately adjacent to the Gladstone central business district, and within the GBRWHA.

The first major wharf was built at Gladstone in 1885. Under the 1914 Gladstone Harbour Board a throughput of 7000 tonnes was reached. The first exports through the port included meat, butter, wool, sugar, horses and cattle.

Coal was first handled at Auckland Point in 1925. During the 1950s the port pioneered bulk coal handling in Queensland by developing and operating coal handling facilities.

Today the Port of Gladstone SPL covers 4448 hectares of land, including more than 700 hectares of reclaimed land and contains eight existing wharf centres, comprising 20 wharves.

Gladstone: Queensland's largest multi-commodity port

The Port of Gladstone is Queensland's largest multi-commodity port and the fourth largest coal export terminal in the world (by throughput). More than 30 products are handled through the port, which are then transported to more than 30 countries.

The port has national significance as one of the few naturally sheltered deep water ports on the east coast of Australia. The Port of Gladstone is a major centre for the import and export of products for the manufacturing, mining and processing industries.

The Port of Gladstone is managed and operated by GPC, a Government Owned Corporation. GPC has a substantial portfolio of port assets that affords diversity options for future sustainable development and growth. Economic, environmental and social sustainability objectives are GPC's driving principles for the long-term strategic planning strategies of the port.

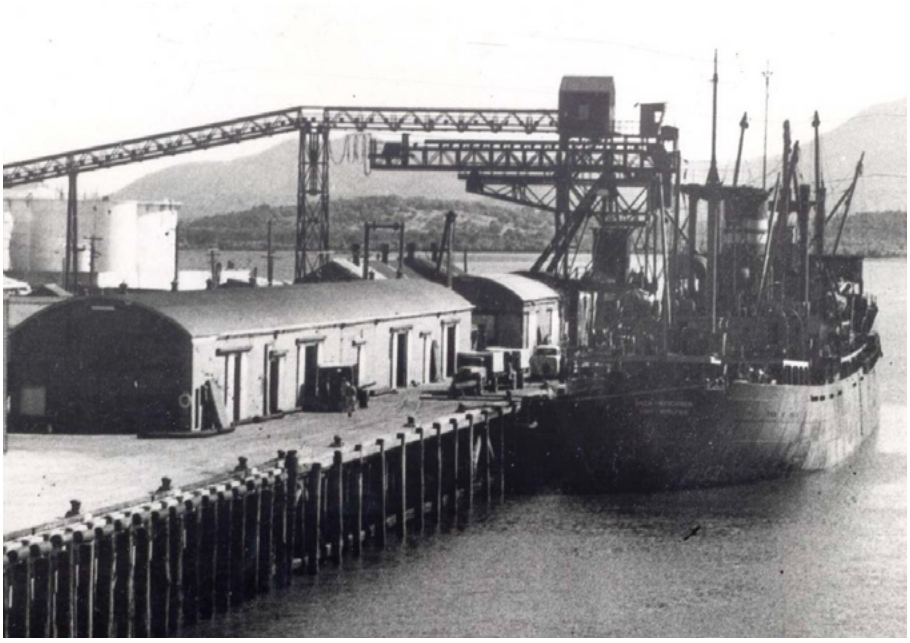
The future focus of GPC is to plan for and develop intergenerational port assets which compliment future trade pathways and development opportunities that promote, facilitate and develop prosperity for Central Queensland and the greater Queensland and Australian economies.

Gladstone: Central Queensland's trade gateway

The Port of Gladstone is strategically located to capture the economic growth associated with the expansion of the resources sector, including the coal seam gas and coal sectors. There is a significant opportunity for the Port of Gladstone to continue to develop as a logistical hub for both the import and export of a wide variety of commodities to and from the Fitzroy and Central Queensland regions and beyond.

The port underpins the growth and prosperity of Gladstone and the broader Central Queensland regions. The Fitzroy and Central Queensland regions are endowed with natural resources and significant established regional transport networks that support market access, trade and regional exports.

While the Bowen Basin coal reserves will remain the dominant export commodity for the Port of Gladstone over the master planning timeframe, other new industries and the expansion of existing industries will contribute to the growth of the port. With a global shift away from non-renewable energy resources, the Port of Gladstone will focus on developing trade pathways for agricultural, containerised and general cargo trades.



Auckland Point in the 1950s.

Role and function of the port

The Port of Gladstone is a major centre for the import and export of products for the manufacturing, mining and process industries.

Handling approximately 1800 vessels annually, it is one of the busiest ports in Australia and plays a vital role in the local, state and national economies.

The port's major functions are to facilitate the:

- export of Queensland resources
- import of raw material and breakbulk
- export of finished products from major industries established in Gladstone.

More than 30 products are currently handled through the Port of Gladstone and shipped to more than 30 countries. The Port of Gladstone predominantly exports coal, alumina and liquefied natural gas (LNG) with other import and export products listed in **Table 1**.

more than **30** **PRODUCTS** are currently handled through the **Port of GLADSTONE**

more than **30** **COUNTRIES** Products are shipped to more than 30 countries

119.4m TONNES throughput In the **2017-18** financial year THE PORT OF **GLADSTONE** had a total throughput of **119.4 MILLION TONNES**

1799 VESSELS VISITED the Port of **GLADSTONE** In the **2017-18** financial year

Table 1 – Port of Gladstone major cargoes

Imports			
Bauxite	Containers	Liquid ammonia	Magnetite
Break bulk	Copper slag	Liquid pitch	Petroleum coke
Bunker oil	General cargo	Liquefied petroleum gas	Petroleum products
Caustic soda	Gypsum		
Exports			
Ammonium nitrate	Cement	General cargo	Logs and woodchip
Alumina	Cement clinker	Grain	Magnesia
Aluminium	Coal	Ilmenite	Magnesite
Break bulk	Containers	Limestone	Scrap metal
Calcite	Fly ash	LNG	

Coal

Coal is the largest volume commodity handled at the Port of Gladstone. There are two coal export terminals at the port, including RG Tanna Coal Terminal and the Wiggins Island Coal Terminal. Coal operations ceased at the Barney Point Coal Terminal in 2016.

Coal exports have shown consistent growth over the past 23 years, tripling from 1995 to 2017 with some fluctuations reflecting market variations. In 2017–18, the coal industry accounted for approximately 56 per cent of the port's total throughput.

Both metallurgical and thermal coal are exported from Gladstone, however the majority of total export is metallurgical coal. The majority of metallurgical coal is exported to Japan, South Korea, Taiwan, India, Italy and France for high quality steel manufacturing. Thermal coal is exported to Japan, Hong Kong, Taiwan, South Korea and Israel for power generation.

Alumina

Alumina is the second largest volume exported commodity, accounting for approximately 23 per cent of total port throughput in 2017–18. Alumina is produced at Queensland Alumina Limited and has shown steady growth over the past 23 years. In 2005 and 2012 there were significant growth periods which coincided with the commencement of operations in stages one and two of Rio Tinto's Yarwun Alumina Refinery.

Liquefied natural gas

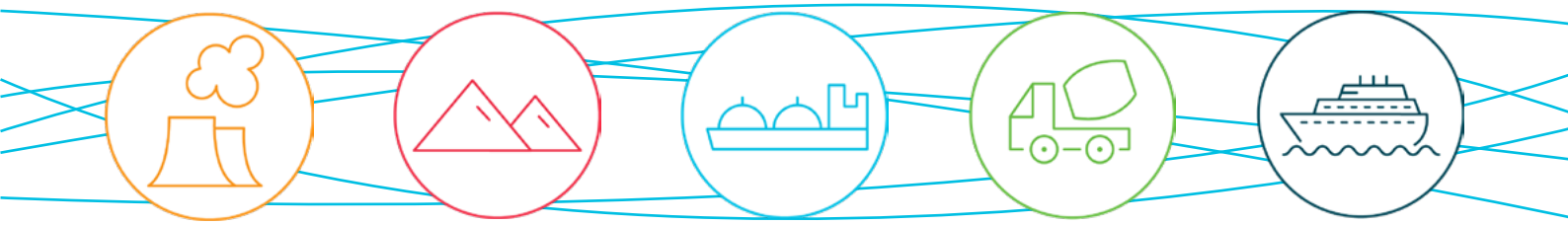
An LNG export industry commenced at the priority Port of Gladstone in 2014–15. LNG exports have continued to grow and was the third largest volume exported commodity in 2017–18. Three LNG operations are located on Curtis Island, each with a dedicated berth. Pipelines convey natural gas from the Bowen and Surat coal basins to the plants for processing and export.

Cement

The Cement Australia facility at Fisherman's Landing processes limestone, clay, silica sand and iron additives to produce cement and clinker (an intermediate product in the cement manufacturing process). The plant is a significant supplier of cement products for the Queensland and Australian markets.

Cruise shipping

The Port of Gladstone is a gateway to the natural wonders of the Southern Great Barrier Reef. Gladstone is now a destination for cruising tourism, as well as a vital link to the islands of the Great Barrier Reef. Gladstone's cruise shipping industry commenced in 2016 at Auckland Point with local tourism facilities located at East Shores and sightseeing opportunities at Mount Larcom, Gladstone Harbour, Quoin Island and key industry locations. The cruise ship market has the potential to boost the Gladstone region's visitation and economy.



Great Barrier Reef

The priority Port of Gladstone operates within the GBRWHA, including almost 38,600ha of marine and intertidal areas. These areas contain habitat for a diverse range of flora and fauna species that contribute to the local expression of the OUV of the GBRWHA.

The Great Barrier Reef was inscribed on the World Heritage List in 1981 in recognition of its OUV, which is the fundamental concept of the World Heritage Convention and underpins the listing of properties on the World Heritage List. The International Union for Conservation of Nature evaluation stated *'... if only one coral reef site in the world were to be chosen for the World Heritage List, the Great Barrier Reef is the site to be chosen'*.

The World Heritage Committee listed the Great Barrier Reef for the following criteria:

- contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance (criterion vii)
- be outstanding examples representing major stages of earth's history, including the record of life, significant ongoing geological processes in the development of landforms, or significant geomorphic or physiographic features (criterion viii)
- be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, freshwater, coastal; and marine ecosystems and communities of plants and animals (criterion ix)

- contain the most important and significant natural habitats for in situ conservation of biological diversity, including those containing threatened species of OUV from the point of view of science or conservation (criterion x).

The Ports Act specifies port-related development in the master planned area needs to be managed to protect the environmental values of the Great Barrier Reef. Port activities were specifically recognised as an existing long-established ongoing use within the GBRWHA in the retrospective statement of OUV.

In accordance with the Ports Act, the OUV of the GBRWHA must be an intrinsic consideration in managing port-related development within the master planned area. To achieve this objective for the OUV of the GBRWHA, the master plan:

- recognises where existing regulatory processes provide for the protection of the OUV
- identifies the local attributes and associated environmental values that contribute to the OUV of the GBRWHA, relevant to the master planned area and surrounding areas
- identifies potential impacts from development in the master planned area on the OUV of the GBRWHA
- states EMF objectives to maintain the OUV of the GBRWHA
- contributes to wider actions under the Reef 2050 Plan.

In addition to its environmental values, the Great Barrier Reef is important for the Queensland and Australian economies. It supports a significant number of jobs from tourism activities, as well as generating important economic, social and cultural contributions from fishing, recreational and scientific activities in the region.

Cumulative impact management

The management of system-wide cumulative impacts on the Great Barrier Reef is important to ensure continuous improvement in managing threats to the Great Barrier Reef. The Queensland Government has committed to 'Protect the Great Barrier Reef' as one its key priorities identified in *Our Future State: Advancing Queensland's Priorities*.

The Queensland Government is managing cumulative impacts on on the Great Barrier Reef through a range of policy initiatives.

This includes strengthening vegetation clearing legislation, introducing a single use plastic bag ban, regulating activities which contribute to water pollution, and introducing the Maintenance Dredging Strategy and guidelines to provide for sustainable, leading practice management of port-related maintenance dredging.

The protection of the Great Barrier Reef and cumulative impact management is also a central concept in the Queensland environmental assessment and planning systems, including through environmental impact assessment processes and state and local planning instruments. These processes are described above in the 'regulating port operations' section. The master plan complements this system and does not replicate, replace or remove any existing processes. The master plan does not commit government or other entities to particular projects and does not infer government approval of development.

Master planning does not modify the assessment process under the EPBC Act which requires an action that is likely to have a significant impact on a matter of national environmental significance (which includes the Great Barrier Reef) to be referred to the Australian Government, to determine if assessment and approval is required, including the assessment of cumulative impacts.

The Ports Act contributes to the management of cumulative impacts of port development on the Great Barrier Reef at a strategic level by limiting port development across the GBRWHA to four priority ports.

Master planning for each priority port establishes a strategic approach by constraining port-related development and capital dredging to a defined master planned area.

The master planned area for the priority Port of Gladstone limits cumulative impacts by using a precinct-based approach to concentrate port-related development in locations that avoid areas of environmental significance. Objectives for specific locations within the master planned area are identified to ensure potential impacts on environmental values are managed to limit cumulative impacts.

The Ports Act requires the master plan is reviewed every 10 years. Due to the long-term planning horizon, and to provide for an adaptive management approach, the master plan can be reviewed outside of this mandatory period to respond to major changes in policy or legislation, where appropriate, including outcomes from the Reef 2050 Plan.

Gladstone State Development Area

The GSDA, located north-west of Gladstone city, includes a defined area of land dedicated for industrial development and supporting land uses. The GSDA is located adjacent to the Port of Gladstone providing important connections between the port and major road and rail networks, and to industry through dedicated corridors that support supply chain infrastructure. It is an ideal location for investment in projects of national and international significance requiring direct access to port-related activities. The GSDA's strategic location allows for the efficient transportation of materials and goods through to the port without impacting Gladstone's populated areas or sensitive environmental areas.

The GSDA was first declared in 1993 in accordance with the SDPWO Act. While being subject to a number of amendments to reflect increases in size and other changes, the GSDA now comprises an area of 27,194 hectares. Approximately 1620 hectares are set aside as an environmental management precinct on Curtis Island to recognise and protect environmental values. Existing and targeted land uses within the GSDA include industrial development, port-related activities, transport and logistics, LNG processing, storage and export activities, materials and gas transportation, and supporting infrastructure. The Coordinator-General is the decision maker for development within the GSDA regulated by the GSDA development scheme.

Managing sustainable growth

Port optimisation

The Port of Gladstone is a critical component of a world-class supply chain that enables the efficient movement of freight from producers to consumers, both domestically and worldwide.

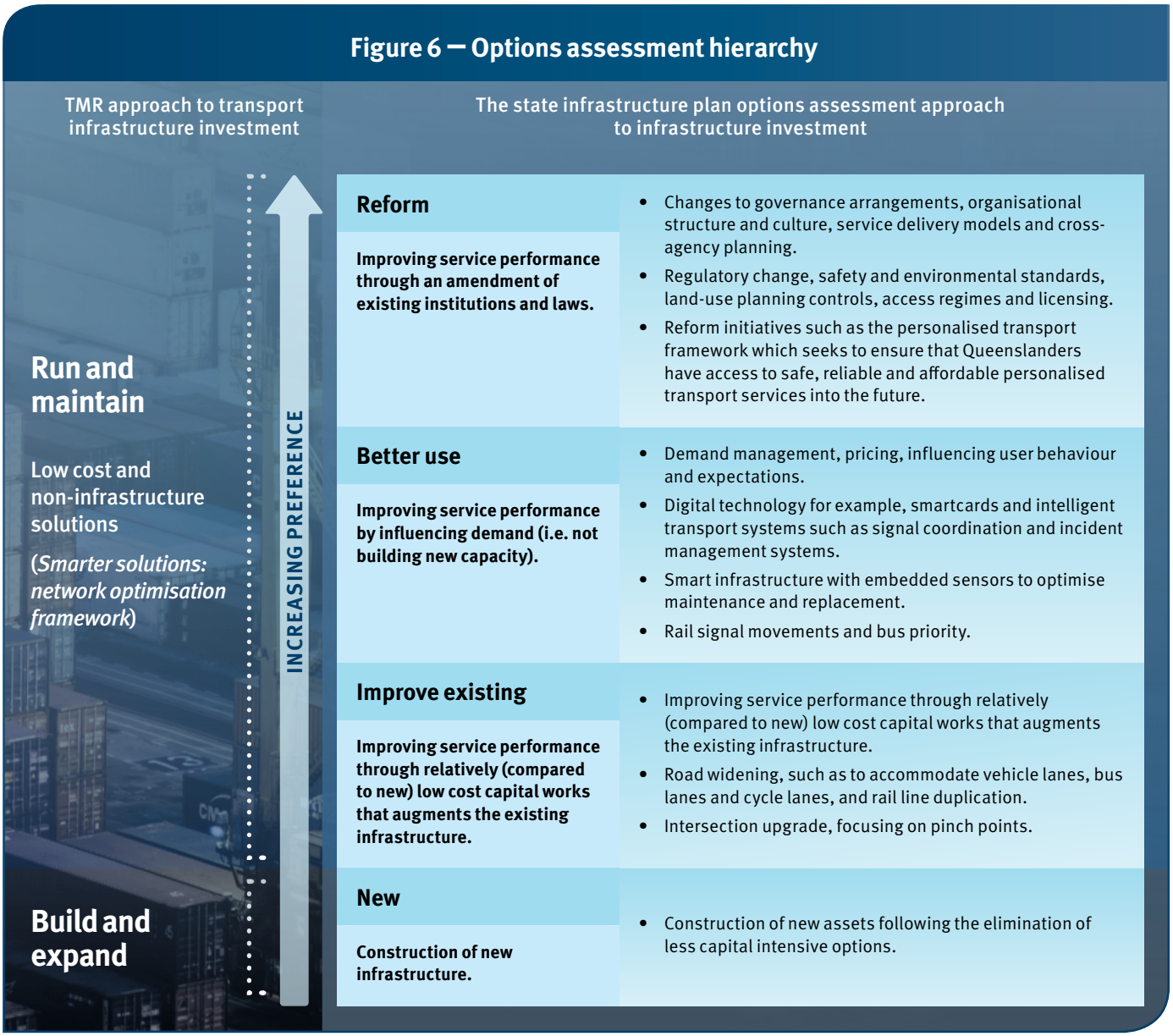
To operate efficiently the port relies on the region's integrated infrastructure network. This network comprises road, rail, shipping and other transport infrastructure, telecommunications, water and gas pipelines, and electricity generation and transmission assets. The infrastructure network supports economic productivity and is a critical factor in optimising the movement of goods to and from the port and its connected industries and consumers.

At the 2012 UNESCO World Heritage Committee meeting, it was recommended an Independent Review of the Gladstone Harbour be undertaken, with a particular focus on the optimisation of port development and operation.

The Independent Review, commissioned in 2013, outlines best practice principles for port planning within and adjacent to the GBRWHA. This includes port optimisation through the consolidation and sharing of infrastructure. The Reef 2050 Plan, prepared in 2015, required best practice principles be incorporated into port planning and management.

There are a variety of matters that can promote or hinder optimisation initiatives, including whether the initiative is being driven privately or by government. To support both government and private initiatives, a number of strategy and planning documents have been released by the Australian and Queensland governments that consider opportunities for optimisation at the planning and investment stages.

Figure 6 — Options assessment hierarchy



At a national level, the *Australian Infrastructure Plan* seeks to improve the efficiency of infrastructure networks to drive greater sustainability. This approach has been reflected in various Queensland Government policies, plans and project assessment frameworks which focus on maximising the use of existing infrastructure and planning for smart solutions for new infrastructure.

The Queensland Government's preference is for state agencies to actively consider all opportunities to extend the life of existing assets before capital expenditure is allocated to build new infrastructure. This preferred approach is also reflected in the Queensland Government's *State Infrastructure Plan*.

The *State Infrastructure Plan* provides the strategic direction of the planning, prioritisation and delivery of infrastructure in Queensland, and a four-year program of potential future investments based on independent advice provided by Building Queensland[4].

Optimisation of port development in the GBRWHA

At the state level, the Ports Act supports the principles of optimisation by restricting port development and capital dredging across the GBRWHA to the four priority ports, including the Port of Gladstone.

[4] Building Queensland provides the Queensland Government with independent, expert advice on major infrastructure. Building Queensland works closely with all departments, government-owned corporations and statutory authorities to guide better infrastructure decision-making.

Through the *State Infrastructure Plan*, it is recognised that optimisation can be achieved through, among other things, planning for infrastructure corridors and data gathering and analytics for improved demand forecasting and information sharing.

The Queensland Government's *Smarter Solutions: Network Optimisation Framework* prioritises the consideration of low cost and non-infrastructure solutions within the planning and investment process. The framework encourages network optimisation solutions to ensure the existing transport network and infrastructure is optimised before major investment. In certain situations, this may be able to generate similar outcomes to new infrastructure, reducing or delaying the need for significant capital expenditure and potential environmental impacts that may arise from new development.

Building on the strategic direction set by the *State Infrastructure Plan*, the *Queensland Transport Coordination Plan 2017–2027* includes system-level objectives for transport to facilitate the efficient movement of people and freight to grow the economy. It includes a commitment to focus on improving connectedness along key regional freight corridors. The *Transport Coordination Plan 2017–2027* includes an investment prioritisation hierarchy (**Figure 6**) which focuses on optimising existing infrastructure before investing in new infrastructure.

Optimisation at the priority Port of Gladstone

Designation of precincts within the master plan further supports optimisation by providing guidance on where development could be consolidated or co-located, and where development should be limited. This approach means the infrastructure required to support development in particular areas can be delivered more efficiently and is more likely to be shared.

The master plan includes objectives and desired outcomes to promote optimisation in Part B.

While the port is a critical component of an important supply chain, optimisation needs to be considered broadly. In many cases, infrastructure constraints and opportunities for optimisation sit outside the port. A whole-of-system approach including both land and marine side transport systems is needed to deliver efficient and affordable infrastructure delivery.

The appropriateness of optimisation will vary depending on the location and nature of the matter or type of infrastructure being considered. Optimisation should be approached on a case-by-case basis. No single approach or technology can be applied broadly in all situations everywhere. The relevant environmental, social or economic aspects may apply to a particular optimisation initiative will dictate its appropriateness and likelihood of success.

Factors that may be relevant when considering optimisation across the integrated port supply chain network may include, but are not limited to:

- geographic, tidal and climatic factors
- location and distances between land and marine-based infrastructure
- compatibility of different trades and technologies at key locations including intermodal facilities, storage facilities and wharves
- location of infrastructure corridors and connections, intermodal operations and relevant protection mechanisms
- configuration of uses and compatibilities
- land tenure and licence agreements
- environmental outcomes and the principles of ESD
- safety considerations
- market factors

GPC Port Efficiency Program

GPC has incorporated a variety of strategies and programs to drive efficiency and optimisation. These strategies and programs intimately involve the collaboration of port customers, terminal operators and service providers. Most recently GPC instituted a Port Efficiency Program that delivers additional Port Capacity and Protection measures resulting in tangible economic, environmental and social benefits. Some examples of the Port Efficiency Program include: Changes to Port Protocols, Procedures and Rules to improve parameters around berthing, vessel transit and separation times. Improvements in the effective and efficient usages of towage and piloting resources.

The implementation of Dynamic Under Keel Clearance technology has facilitated increased trade capability safely without the need change existing shipping channel infrastructure.

- the timing and extent of capital and maintenance dredging (that is, navigation channels, swing basins and/or berth pockets)
- access to, and number and utilisation of, port berths and ability to control allocations
- the operational efficiency of the port and supply chain network.

Central to the function of any port is providing and maintaining shipping channels and essential port services such as pilotage and towage. Optimising port throughput is contingent on safe and efficient vessel movements. Maintaining and improving port channels, berth pockets and swing basins support port optimisation by ensuring safe navigation of the harbour, channels, anchorages and pilotage areas. All Queensland ports must fulfil their requirement to provide and operate effective and efficient port facilities and services under the *Transport Infrastructure Act 1994*. The *Port Procedures and Information for Shipping – Gladstone* issued by the Regional Harbour Master under the *Transport Operations (Marine Safety) Act 1994* directs all ship owners, masters and other persons to ensure maritime safety and minimise potential environmental impacts.

Consideration of environmental factors, and meaningful stakeholder engagement from the commencement of project planning, will help to ensure resulting designs and solutions are site specific and regionally appropriate. It will also help to ensure the impacts of new developments on the environment are considered within the context of cumulative pressures.

Supply chain infrastructure

Supply chain infrastructure ensures goods can transit through the port efficiently. It is critical to the effective operation of the port network and the regional businesses and industries it services. As part of an integrated transport network, supply chain corridors should have direct and unimpeded access which in turn provides opportunities for increases in trade to catchment areas and industry.

Supply chain infrastructure comprises an integrated transport network which includes road, rail and marine based infrastructure connecting the port to economic markets. It is essential that land and marine infrastructure is coordinated and integrated, including capacity, timing of upgrades, maintenance and operational synergy.

The current supply chain infrastructure supporting the port and port-related development is summarised in **Table 2** and key supply chains are mapped in **Figure 7**.

It is possible that new or upgraded supply chain infrastructure that increases the capacity and efficiency of the infrastructure networks servicing the port could support increases in levels of trade and enhance economic opportunities, if there are sufficient levels of market demand to fund the projects.

Case study: previous optimisation of supply chain infrastructure

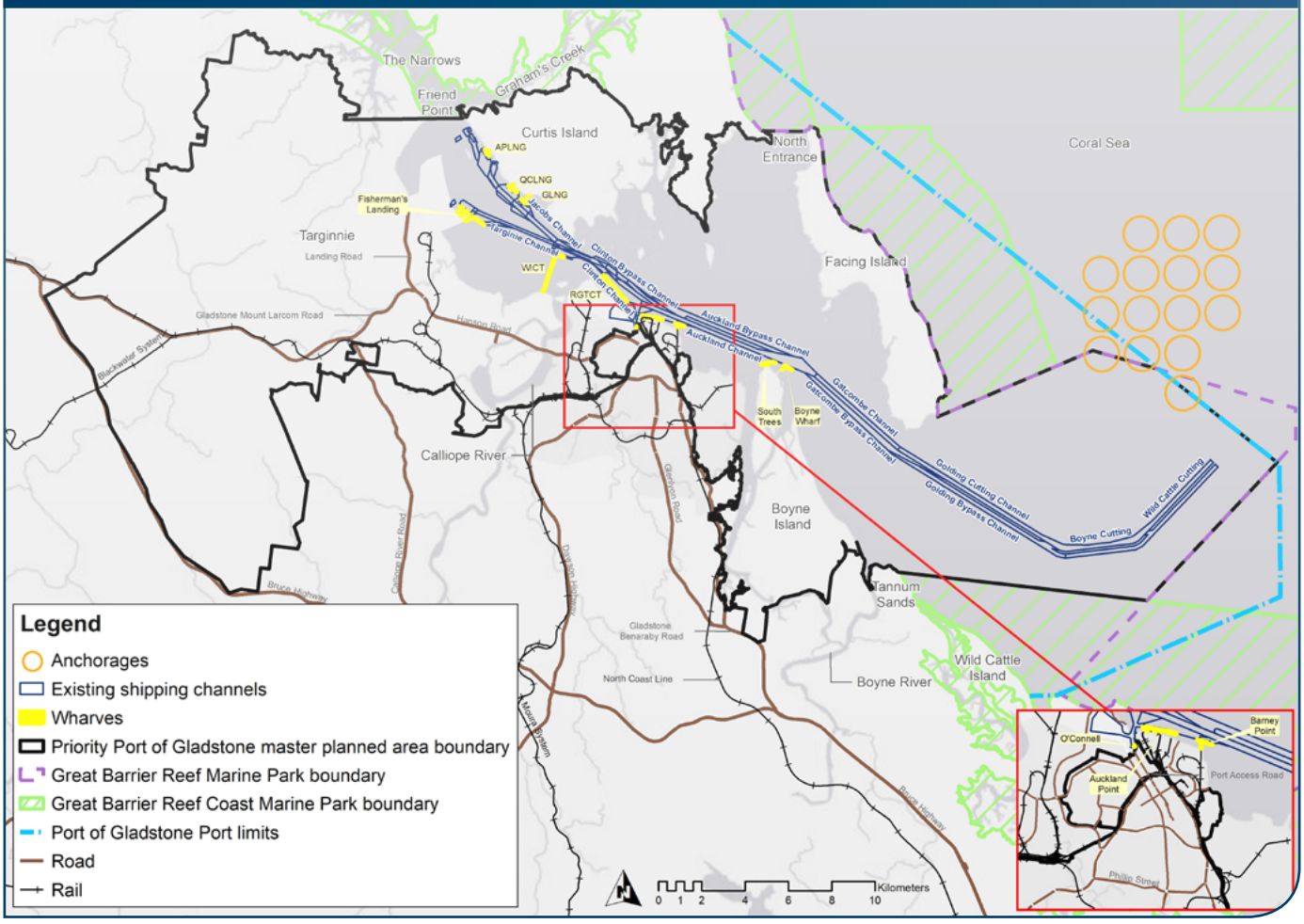
The efficient use of port and supply chain infrastructure ensures that the purpose of the Ports Act is achieved. Optimisation has been implemented through a number of supply chain infrastructure arrangements in Gladstone, including:

- shared use of the Gladstone Port Access Road and planning for a second stage
- shared use of Blackwater and Moura rail systems and the North Coast Line
- shared use of shipping channels within the harbour
- identification of the Materials Transportation and Services Corridor Precinct in the GSDA development scheme to consolidate infrastructure.

Table 2 – Supply chain infrastructure

Type of supply chain infrastructure	Supply chain infrastructure	Function	Significance
Road	Bruce Highway	Major state highway connecting to points north and south along the east coast of Queensland	Queensland's primary eastern highway and a significant corridor within the National Land Transport Network
	Dawson Highway	Regional highway linking the hinterland in the west to the Bruce Highway and Gladstone	Central Queensland's western highway
	Gladstone Mount Larcom Road	State controlled road connecting the Bruce Highway to the GSDA, Fisherman's Landing area and Hanson Road	Key to connecting major port and industry road network with existing highway and haulage routes
	Hanson Road, Glenlyon Road, Phillip Street and Bernaraby Road	State controlled roads connecting Gladstone Mount Larcom Road to the port areas between Fisherman's Landing and Boyne Island	Key to connecting major port and industry road network
	Port Access Road	Connects Dawson Highway and Hanson Road to Port Central	Essential to connecting port and industry road networks, and providing a safe heavy vehicle road network that bypasses the Gladstone business district, reducing heavy and light/non-commercial vehicle interactions
	Landing Road	Provides connection between Fisherman's Landing and Gladstone Mount Larcom Road	Key to connecting major port and industry road networks with existing highway and haulage routes
	Calliope River Road	Provides connection from the Bruce Highway to the GSDA and Gladstone Mount Larcom Road	Key to connecting major port and industry road networks with existing highway and haulage routes
Rail	North Coast Line	Shared service railway line that is the principal regional freight and passenger line within the Queensland Rail network	Primary line along the Queensland coastline
	Moura and Blackwater systems	Forms part of the Central Queensland coal network	Primary line connecting the mines to the port
Marine	Shipping channels and aids to navigation (including marine and land-based aids)	Navigational channels provide safe passage for vessels through the port	Critical for vessel safety and access into and within the port
	Anchorages within and outside port limits surrounding the port	Providing for safe anchorage locations for vessels within port limits (emergency anchorages), and vessels waiting to enter the port (offshore anchorages)	Critical infrastructure for vessels to safely wait within the port, and prior to entering the port
	Jetties, breakwaters, berth pockets, swing basins and wharves situated within the port	Infrastructure required for effective and efficient operation of the port	Critical infrastructure and facilities for vessel access into and within the port
Port (land side)	Gantry cranes, storage facilities, internal road/rail, linear infrastructure (for example conveyors and pipelines), waste facilities and trunk infrastructure networks (for example power, water and waste)	Provides for cargo and material handling, storage and transport of goods within the port	Critical for ongoing efficiency of port operations

Figure 7 – Key supply chains connecting to the Port of Gladstone



Dredging requirements

Dredging involves the removal of material from waterways to deepen channels, create harbours and maintain navigation channels and approaches to ports at defined depths to allow the safe passage of vessels. Dredging can either be capital dredging associated with new navigation channels, berth pockets and swing basins, or maintenance dredging necessary to maintain existing and approved seafloor profiles.

Capital dredging

Capital dredging is an essential part of port development and is required to create new, or expand existing navigation channels, berth pockets and swing basins.

The Ports Act prohibits major capital dredging for development of new or expansion of existing port facilities in the GBRWHA outside the priority port master planned areas.

The Ports Act allows capital dredging in the priority Port of Gladstone master planned area, however the material generated must not be deposited or disposed of in a restricted area[5] unless the material is beneficially reused. The master planned area is identified in **Figure 8** and **Appendix A**.

Beneficial reuse is the practice of using dredged material for a purpose that provides social, economic or environmental benefits (or a combination of these). This means dredged material is managed as a valuable resource rather than a product destined for disposal.

Areas for the beneficial reuse of capital dredged material within the master planned area are likely to be required within the timeframe of the master plan.

Maintenance dredging

Queensland ports are required to undertake maintenance dredging to fulfil their requirement to provide and operate safe, effective and efficient port facilities and services under the *Transport Infrastructure Act 1994*.

[5] Section 33 of the Ports Act defines the restricted area as an area within the GBRWHA but outside the Great Barrier Reef Marine Park.

Maintenance dredging involves dredging carried out for the purposes of removing sediments that have accumulated in the existing navigation channels, berth pockets, approaches and swing basins of a port in order to maintain an existing approved capital dredging seafloor profile. Without maintenance dredging, navigation channels would naturally become shallower over time and significantly impact the safe passage of vessels, and the operations of the port and associated supply chain.

Maintenance dredging and the sea-based placement of associated dredged material at Queensland ports is regulated by a comprehensive regulatory approval system at both the Commonwealth and state government levels in accordance with international agreements, and Commonwealth and state regulatory requirements.

All maintenance dredging at the priority Port of Gladstone will be undertaken in accordance with an approved LMDMP as required by the state's Maintenance Dredging Strategy. The LMDMP will ensure maintenance dredging and any material placement options are properly assessed and leading practice measures are in place to ensure maintenance dredging operations are appropriately managed. GPC has a maintenance dredged material placement area north-east of East Banks within port limits, subject to Commonwealth and state regulatory approvals. The establishment of this area included assessment of alternative placement options as per the *National Assessment Guidelines for Dredging 2009*.

Areas adjoining port operations

The interface between the port and adjacent urban areas is an important consideration in Gladstone. By including these areas in the master planned area, future development at Auckland Point and Barney Point can be managed to provide appropriate protection to residents from port-related impacts while supporting the ongoing operation and growth of the port.

There are some areas at Auckland Hill and Barney Point in close proximity to port operations and designated as medium density residential under the GRC planning scheme. Although dwelling houses are currently the predominant land use in this area, the existing provisions in the GRC planning scheme allow the development of multiple dwellings (for example, a medium rise apartment block). This type of intensified development could potentially significantly increase the number of residents living close to the port. This has the potential to increase adverse amenity impacts for residents as a result of port operations (for example light, dust, noise and vibration).

The master plan seeks to guide GPC and GRC planning at Auckland Point and Barney Point – collectively referred to as the 'Interface precinct' (refer Part C, **Figure 11** and **Appendix A**). This approach protects residents' amenity while supporting the ongoing operation and growth of the port.

Future development in the Interface precinct, including both port infrastructure and residential buildings (excluding dwelling houses), must be planned for in a manner that considers the adjacent land uses. This includes additional considerations for GPC and GRC during the development assessment process, such as parameters for the design and construction of future development.

Existing lawful uses within the master planned area, including dwelling houses, will not be affected by the master plan or port overlay. Similarly, any future development of dwelling houses within the interface precinct will not be affected as this use does not result in increased intensification.

The Interface precinct does not allow the port to resume or encroach into residential areas. It seeks to ensure the port recognises the interface with residents of Auckland Hill and Barney Point in its future development, and new residential buildings mitigate adverse amenity impacts from the port. Any development within the precinct will still require all relevant approvals.

Part B: Strategic vision, objectives and desired outcomes

Strategic vision

The long-term strategic vision for the master planned area for the planning horizon to 2050 is:

'The master planned area for the priority Port of Gladstone will enable Queensland's largest multi-commodity port and associated industrial area to develop in a sustainable manner. Development will provide for management of the local expression of the Outstanding Universal Value of the Great Barrier Reef World Heritage Area, and any potential impacts on environmental values, community wellbeing and cultural heritage within and surrounding the master planned area.'

Objectives

The objectives for the master planned area in **Table 3** clarify how the strategic vision will be achieved and their alignment with state interests.

Desired outcomes

The desired outcomes for the master planned area contribute to achieving the strategic vision and objectives for all of the master planned area. Outcomes to be achieved within the master planned area are included in **Table 4**.

Table 3 – Objectives to achieve the strategic vision	
State interest	**Objectives**[6]
Management of port-related development	**Sustainable growth** – enable the ongoing sustainable growth of trade through the priority Port of Gladstone.
	Efficient land use – continue to use and develop land and marine infrastructure efficiently where practicable.
	Efficient operations – maintaining and enhancing the efficient and effective operation of the port.
	Locational integration – continuous optimisation of the nature and location of port operations to minimise off-site impacts and to improve integration with surrounding land uses.
	Safe navigation – maintain and enhance the safe operation of the port's navigable waterways and shipping.
	Operational security – ensure future land uses and development within the port and in surrounding areas do not compromise or impact upon current or future port operation.
Economic	**Economic prosperity** – facilitate the economic growth of the Gladstone region and Queensland.
Environment	**Protecting the GBRWHA** – avoid, mitigate and/or offset impacts from development on the OUV of the GBRWHA.
	Environmental values – recognise and avoid, mitigate and/or offset impacts from development on environmental values, including the natural, social and cultural environments within and surrounding the master planned area.
Infrastructure	**Supply chain efficiency** – protect land required for supply chain infrastructure to maximise the effective operation of the port and associated industrial areas, as well as the transport network servicing the port.
	Industrial opportunities – promote opportunities for the growth of logistics, freight and complementary land uses in strategic locations.
	Efficient logistics – ensure port-related development is located to support efficient operation of supply chain infrastructure and improve road freight transport efficiency by catering for High Productivity Vehicles on road freight routes leading to the port.
Community	**Community wellbeing** – support wellbeing for the community in the Gladstone region.
	Safety and security – provide for the safety and security of people and property.
	Community access – provide for community use of, and access to, public space.

[6] It is recognised objectives may align with more than one state interest.

Table 4 – Desired outcomes

State interest	Desired outcomes[7]
Management of port-related development	**Provision of development areas** – land and marine areas are available for the development of the port and associated industries, and other development that supports and/or does not compromise port-related activities.
	Port optimisation – port infrastructure is optimised, depending on the economic, environmental and social context, prior to any expansion or development where practicable.
	Capital dredging – capital dredging is undertaken where necessary to support the ongoing operation and growth of the priority Port of Gladstone and provide for safe navigation.
	Maintenance dredging – maintenance dredging is undertaken to ensure efficient and safe navigation of waterways undertaken in accordance with the LMDMP and guidelines developed under the Maintenance Dredging Strategy.
Economic	**Industrial opportunity** – provide for major industries of regional, state, national and global significance.
	Regional prosperity – provide economic benefit and employment opportunities for the Gladstone region.
	Extractive resources – recognise the economic value of extractive resources, state-owned quarry material under the *Forestry Act 1959* and minerals.
	Forests – recognise the economic, recreational and environmental values of native forests, including state forests.
Environment	**Beneficial reuse** – material generated from capital dredging is beneficially reused or placed on land where it is environmentally safe to do so.
	Environmental management – avoid, mitigate and/or offset impacts from development on environmental values (natural, social, cultural), including those that contribute to the OUV of the GBRWHA.
	Environmental outcomes – existing Commonwealth and state offset legislation and policies are recognised and appropriately addressed.
	Scenic amenity – avoid and/or mitigate impact from development on the scenic amenity of land and marine areas.
Infrastructure	**Supply chain infrastructure** – provide for adequate supply chain infrastructure, including connections between land and marine areas.
	Responsive infrastructure – port and supply chain infrastructure is planned and provided to meet market demand with capacity to adapt to changing technology, and cargo trends that meets the needs of changing user requirements.
	Infrastructure optimisation – use of supply chain infrastructure is optimised prior to any expansion or development where practicable, depending on the economic, environmental and social context.
	Avoid encroachment – encroachment from incompatible uses on infrastructure corridors and nodes is avoided.
Community	**Built environment** – adverse impacts from port-related development and sensitive land uses are appropriately avoided and/or mitigated.
	Community accessibility – provide appropriate public access to the waterfront and harbour where practicable and safe having regard to existing and future port operational needs and safety/security considerations.
	Cultural heritage – impacts on cultural heritage values are minimised, in accordance with the cultural heritage duty of care[8] under section 23(1) of the *Aboriginal Cultural Heritage Act 2003* – this may include, but is not limited to, listed cultural heritage sites.

[7] It is recognised desired outcomes may align with more than one state interest.

[8] For further information on the cultural heritage duty of care requirements, refer to the Department of Aboriginal and Torres Strait Islander Partnership's *Aboriginal Cultural Heritage Act 2003 Duty of Care Guidelines* at https://www.datsip.qld.gov.au/resources/datsima/people-communities/cultural-heritage/duty-of-care-guidelines.pdf

Part C: Master planned area and precincts

Overview

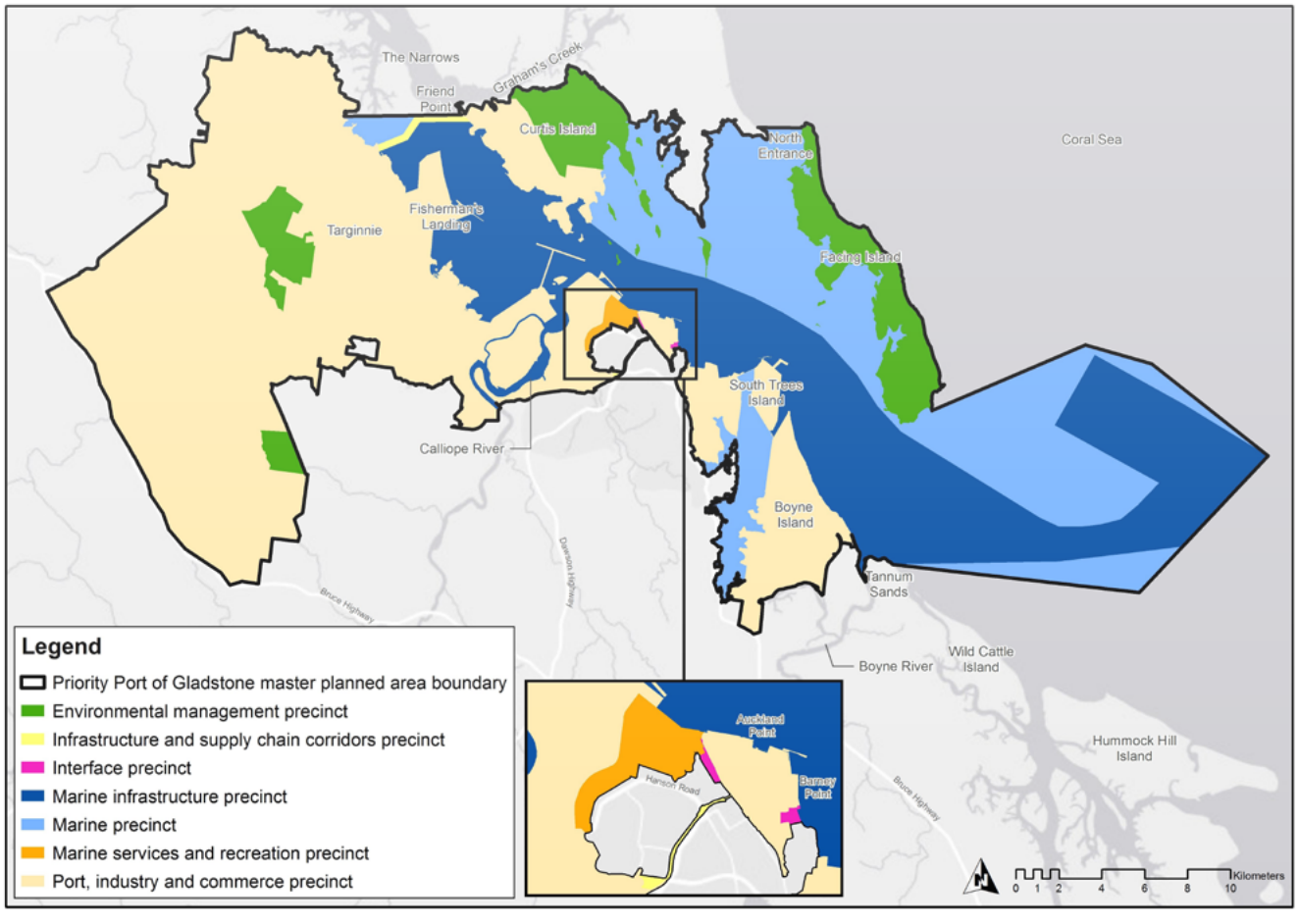
The master planned area was determined through an evidence-based, comprehensive consultation process. The master planned area encompasses land and marine areas considered important for the efficient development and operation of the port, and for the management of potential impacts on OUV of the GBRWHA and other environmental values that may occur as a result of port development and operations. Precincts have been identified within the master planned area to identify the long-term objectives and intent for specific areas.

Under the Ports Act, the master planned area may include land outside SPL—the land identified in the port's land use plan. The master planned area allows for the identification of land and infrastructure outside SPL critical to the long-term operation of the port and supply chain infrastructure, and a coordinated planning approach for port-related development. The precinct approach has enabled identification of those areas suitable for long-term industrial development and those areas where environmental values are the predominant consideration.

The master planned area includes land already identified in planning instruments for existing and future port-related industrial development and supply chain infrastructure. Importantly, the master planned area does not designate any new industrial land outside of the established GSDA, SPL or other existing operating industry. However, it is recognised development within industrial land outside the master planned area identified under the GRC planning scheme may also be port-related.

The marine extent of the master planned area is within port limits and outside the Commonwealth and state marine parks. Capital dredging for

Figure 8 – Master planned area and precincts



port facilities will only occur within the master planned area and will be undertaken in accordance with the relevant Commonwealth and state approvals.

Master planned area

The master planned area encompasses approximately 73,000 hectares. The land component is approximately 40,000 hectares and the marine component is approximately 33,000 hectares. **Figure 8** illustrates the master planned area boundary and precincts, while **Appendix A** provides the regulation map and detailed precinct maps.

Precincts under the GPC land use plan, GRC planning scheme and GSDA development scheme will continue to apply.

The master planned area includes:

- the GSDA
- Port of Gladstone SPL
- marine areas within the Port of Gladstone port limits that are not Commonwealth or state marine parks
- part of the GRC local government area
- part of the GBRWHA.

Precincts

The purpose of the precincts within the master planned area is to identify the long-term objectives and intent for specific areas within the master planned area. Precincts under the GPC LUP, GRC planning scheme and GSDA development scheme will continue to apply.

The precincts included in the master planned area are:

- Environmental management precinct
- Infrastructure and supply chain corridors precinct
- Interface precinct
- Marine precinct
- Marine infrastructure precinct
- Marine services and recreation precinct
- Port, industry and commerce precinct.

The precincts support cumulative impact management within the master planned area by identifying areas with environmental values where development should be limited, as well as separate areas that may be suitable for infrastructure. The master plan does not infer government approval of development and all proposals will still require full assessment in accordance with relevant statutory approval processes irrespective of the precinct it is located in, including consideration of cumulative impacts.

A summary of the evidence-based considerations identified during master planning for each precinct is summarised in **Table 5**.

Each precinct in the master planned area is explained in the sections below, including a description of the:

- spatial extent[9]
- long-term purpose of the precinct
- precinct area description
- precinct outcomes[10].

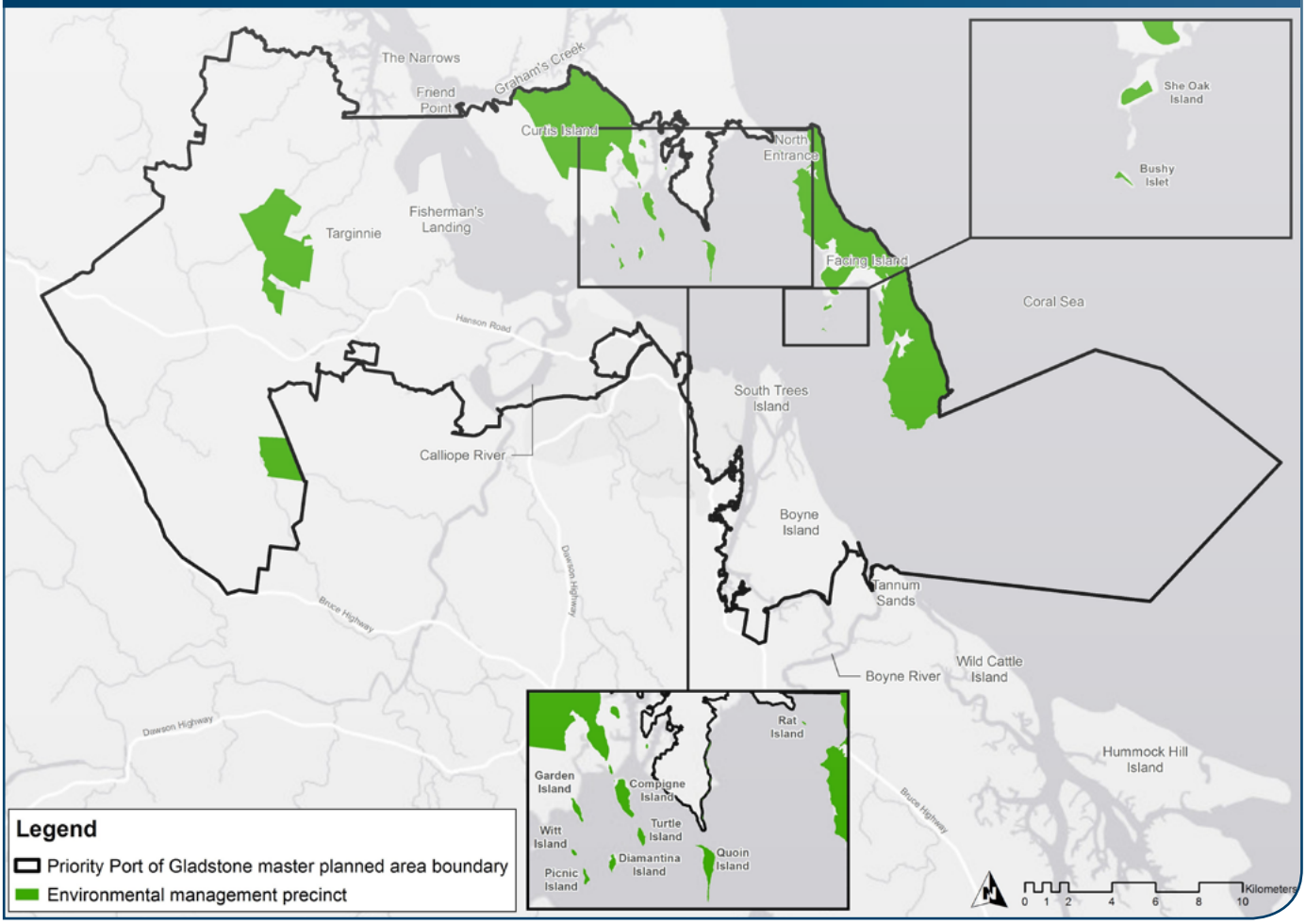
Table 5 – Considerations in the identification of precinct boundaries

Precinct	Considerations
Environmental management	Areas with identified environmental values, including those that contribute to the OUV of the GBRWHA, and identified in planning instruments as having a predominantly environmental management purpose, where development should be limited.
Infrastructure and supply chain corridors	Existing and planned infrastructure and supply chain corridors over land and marine areas, where not already adequately identified in planning instruments.
Interface	Areas where residential properties and port operations are in close proximity and amenity impacts should be managed.
Marine infrastructure	Existing and planned marine infrastructure corridors and nodes.
Marine	Marine areas identified as having environmental values, including those that contribute to the OUV of the GBRWHA, where development should be limited.
Marine services and recreation	Areas identified in planning instruments to provide for marine services and recreation.
Port, industry and commerce	Areas identified in planning instruments to predominantly provide for port operations, industry, commerce and supporting activities.

[9] Precinct mapping including cadastral boundaries is available at Appendix A.
[10] Precinct outcomes apply to specific locations within the master planned area, whereas the desired outcomes (refer Part B) apply more broadly to the master planned area. Examples of development listed are indicative only and any proposal still requires all relevant approvals prior to proceeding.

Environmental management precinct

Figure 9 – Environmental management precinct



Purpose

The purpose of the **Environmental management precinct** is to limit development and avoid adverse impacts on environmental values.

Description

The precinct includes:

- Mount Larcom landform
- Aldoga reserve
- Facing Island
- part of Curtis Island
- other inshore islands.

The precinct comprises land identified as being of environmental significance within relevant planning instruments.

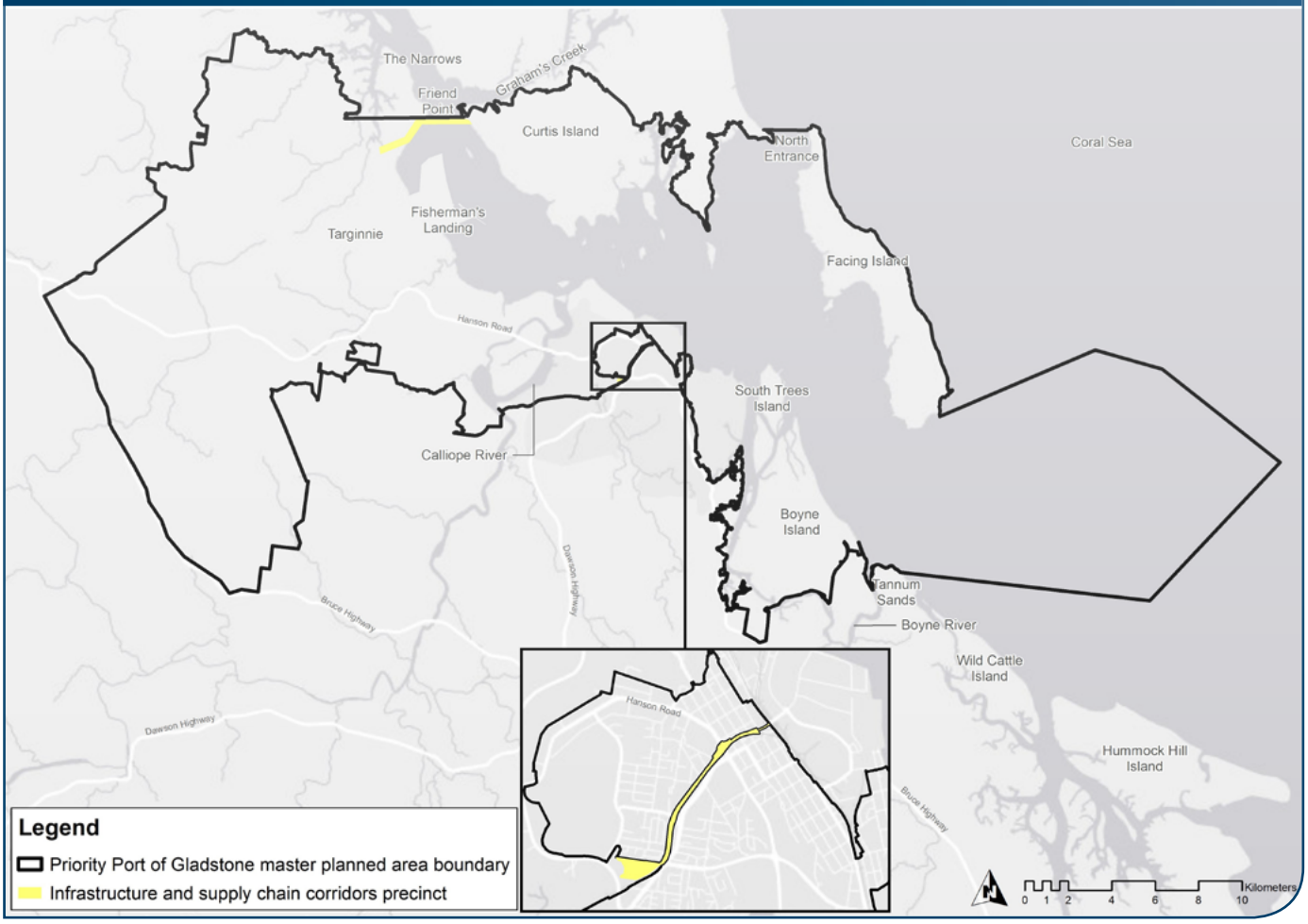
Outcomes

Uses that do not compromise the environmental values of the area may be acceptable, including limited public access such as boardwalks or visitor centres. Limited development in the southern part of Quoin Island and existing townships on Facing Island may also be acceptable where the long-term purpose of the precinct is not compromised.

Essential infrastructure such as telecommunications and electricity network infrastructure may be located in this precinct to service adjoining industry or residential development if no other alternative is available.

Infrastructure and supply chain corridors precinct

Figure 10 – Infrastructure and supply chain corridors precinct



Purpose

The purpose of the **Infrastructure and supply chain corridors precinct** is to allow for the development of critical land and marine supply chain infrastructure to and from the port, and within the master planned area.

Description

This precinct includes:

- planned Port Access Road extension
- potential mainland to Curtis Island road and/or rail link.

Outcomes

Development maintains and provides for the safe and efficient operation and management of supply chain infrastructure.

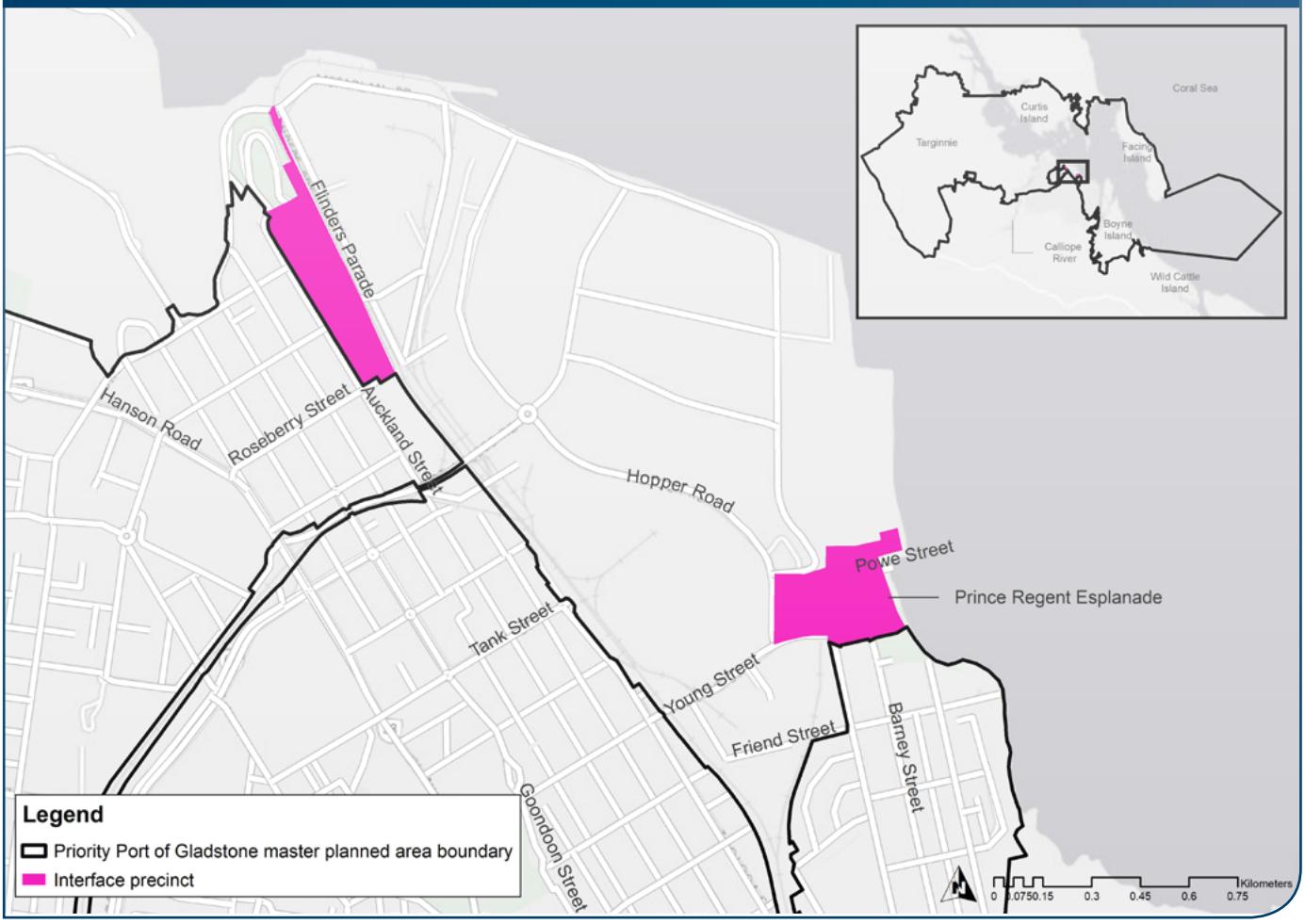
Development is appropriately designed and located to accommodate the delivery of infrastructure.

Development protects the existing Port Access Road and planned extension, and the potential mainland to Curtis Island corridor.

Development of the Port Access Road provides for the safe separation of heavy vehicles from light and non-commercial vehicles.

Interface precinct

Figure 11 – Interface precinct



Purpose

The purpose of the **Interface precinct** is to manage the interface between sensitive land uses and adjoining port and industry operations.

Description

This precinct includes:

- areas of SPL at Auckland Point and Barney Point
- areas adjacent to SPL at Auckland Point and Barney Point within the GRC local government area.

Outcomes

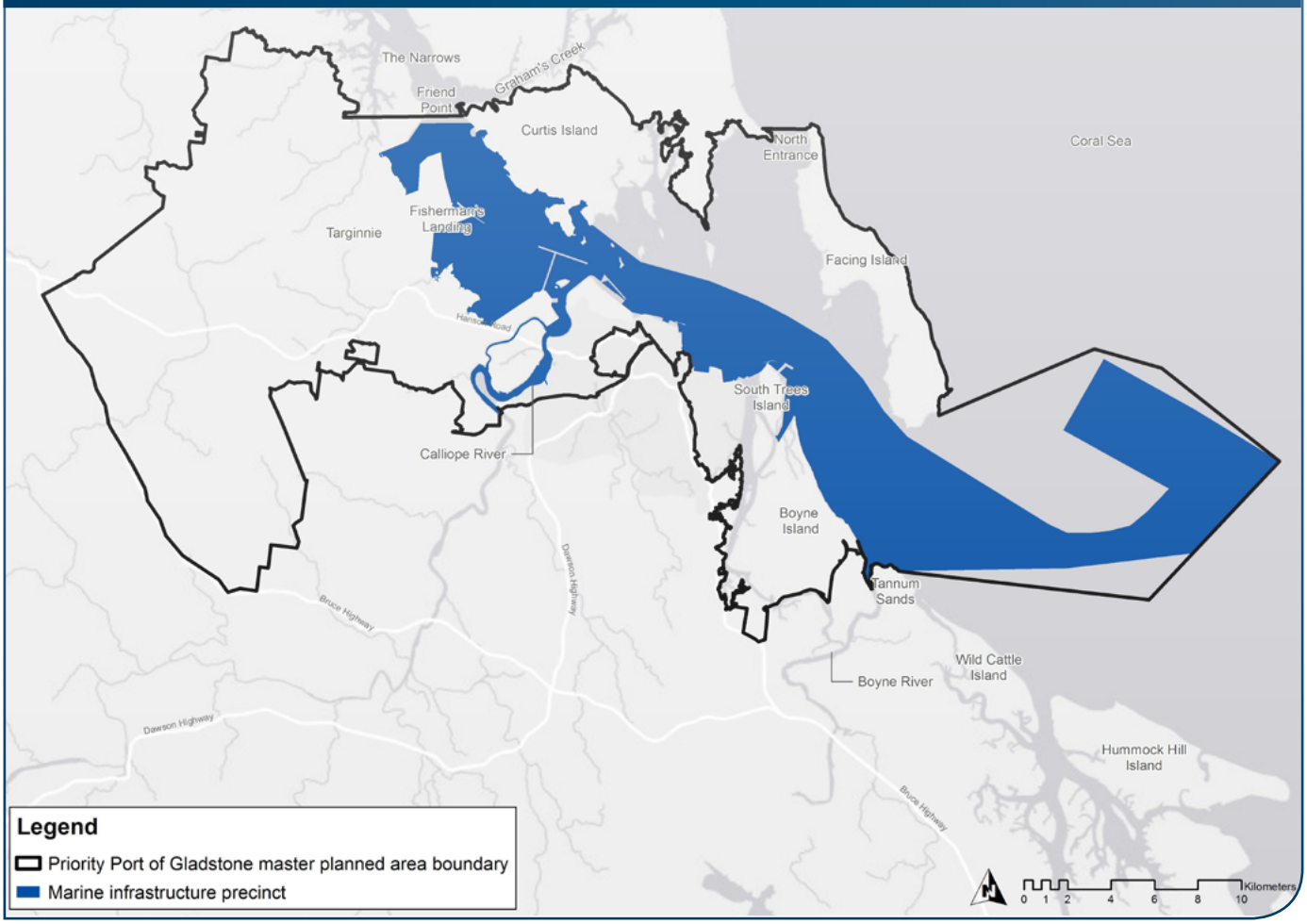
Port and port-related development must be appropriately designed and located to avoid and/or mitigate potential amenity impacts on sensitive land uses, including residential areas.

Existing and future dwelling houses will not be affected by the port overlay.

Development within this precinct must not restrict the operation or development of port, industrial or supply chain activities.

Marine infrastructure precinct

Figure 12 – Marine infrastructure precinct



Purpose

The purpose of the **Marine infrastructure precinct** is to ensure port and shipping access to navigation channels and waterside areas, and provide for marine-based port infrastructure and operational requirements, appropriate recreational and commercial activities while avoiding, mitigating and/or offsetting potential impacts from development on environmental values.

Description

This precinct includes existing navigation channels, swing basins, berth pockets, and the existing East Banks maintenance dredged material placement area (refer **Figure 13**).

This precinct contains areas that may be suitable for the beneficial reuse of dredged material (which are likely to be required within the timeframe of the master plan), subject to all relevant approvals.

It is recognised additional marine infrastructure outside of the master planned area is important to the operation of the port.

This precinct generally extends to the highest astronomical tide (HAT) and includes:

- intertidal and marine areas
- part of Calliope River
- part of Boyne River.

Outcomes

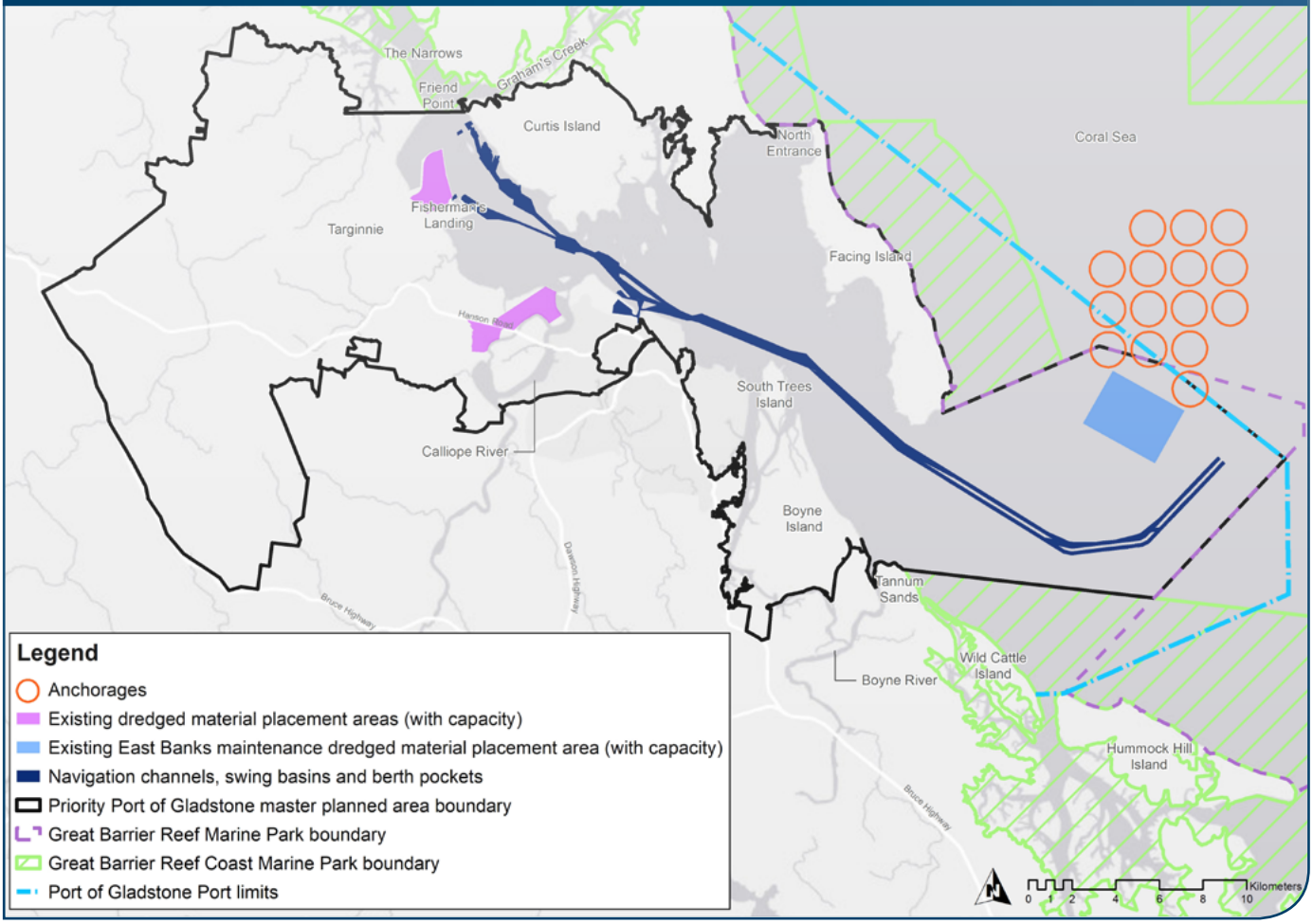
Development within this precinct provides for works required to widen and deepen the existing shipping channels, consistent with relevant state and Commonwealth approvals, to facilitate the future growth of the port.

Development within this precinct must not compromise or adversely impact on the port and shipping access, marine-based port infrastructure, material placement areas or the potential future expansion of port operations.

Development within this precinct includes marine-based activities associated with ship navigation, berthing of vessels, emergency anchorages, and dredging (capital and maintenance) required to enhance and maintain the safe navigation and operation within the port. This may include navigation channels, port berths and wharves, jetties, floating pontoon facilities, conveyors, pipelines, material placement area and emergency anchorages.

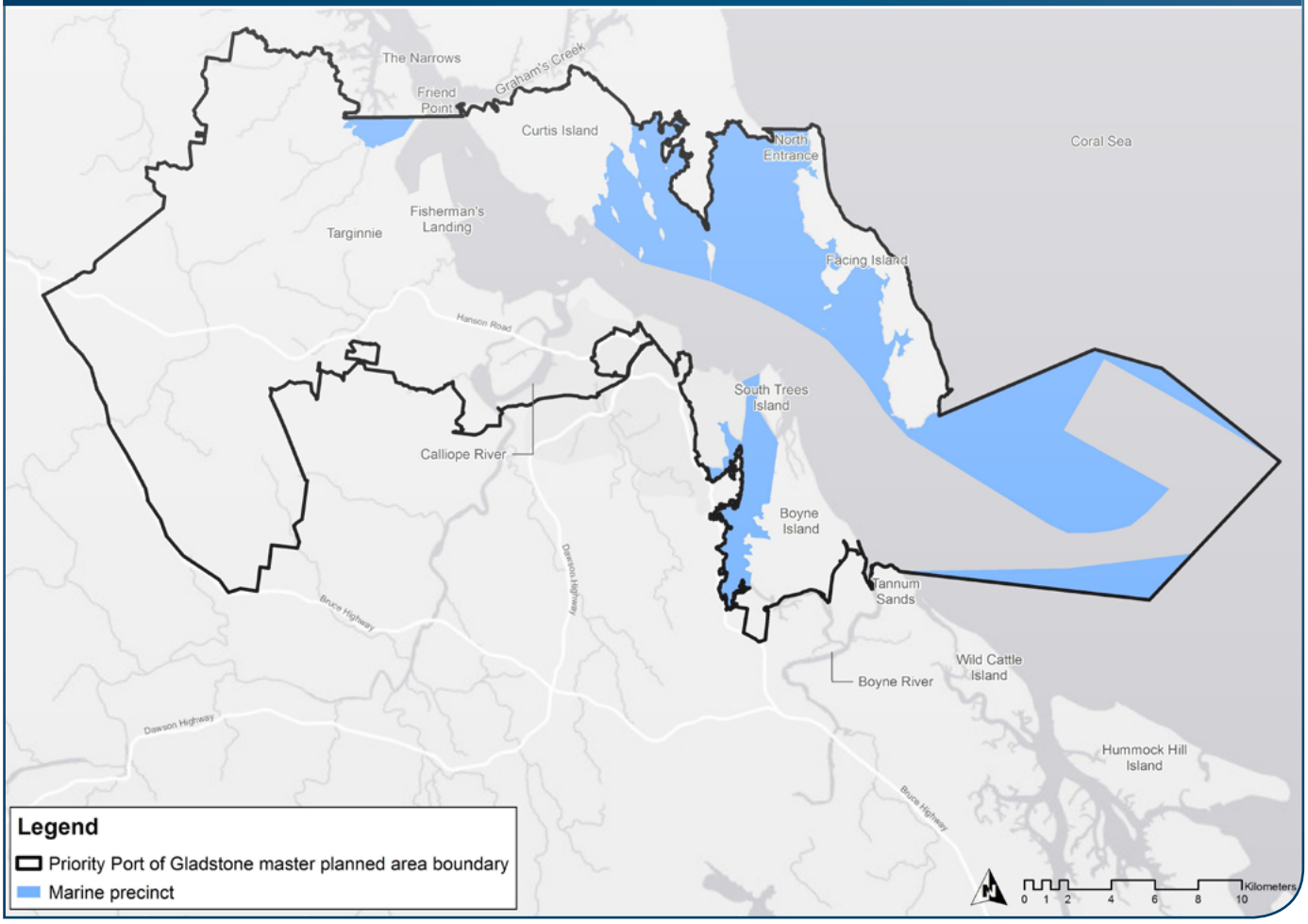
Development involving dredged material placement for beneficial reuse within this precinct must not compromise or adversely impact on existing adjacent uses.

Figure 13 – Existing navigation channels, swing basins, berth pockets, dredged material placement areas and anchorages



Marine precinct

Figure 14 – Marine precinct



Purpose

The purpose of the **Marine precinct** is to avoid, mitigate and/or offset impacts on environmental value while providing for limited port and non-port related marine activities.

Description

This precinct generally extends to the HAT and includes intertidal and marine areas adjoining the marine infrastructure precinct not critical to the operation or growth of the port. The precinct includes:

- intertidal and marine areas
- South Trees Inlet.

Outcomes

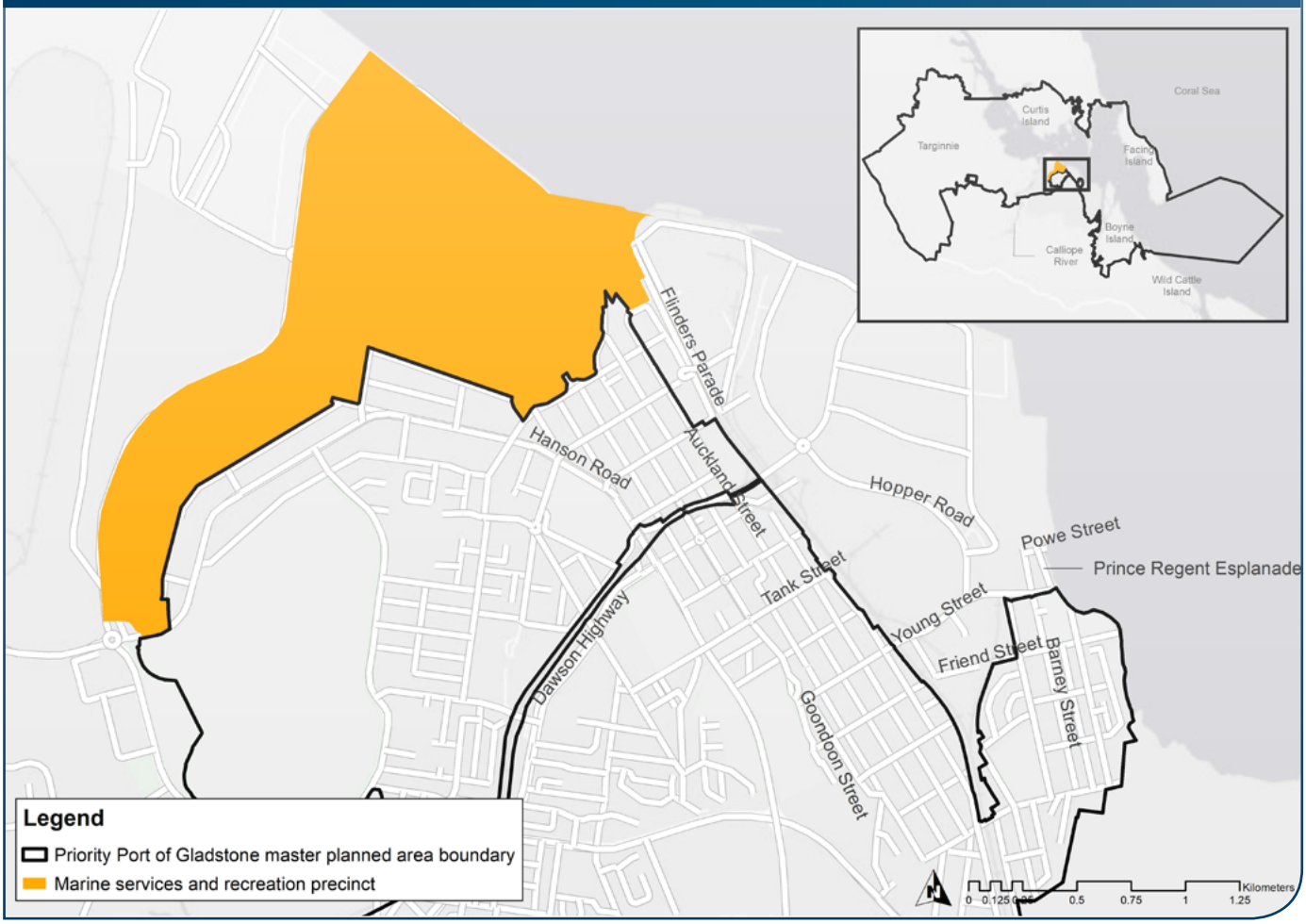
Development must avoid and mitigate impacts on environmental values within and surrounding the master planned area. Where this cannot be reasonably achieved, significant residual impacts are offset.

Development and uses that do not compromise the environmental values of the marine area may be acceptable, including small scale maritime infrastructure, boat ramps, pontoons and coastal protection structures, coastal rescue services, commercial, tourism and recreational uses. This may also include the development of renewable energy sources such as tidal turbines.

Beneficial reuse of dredged material for environmental restoration purposes, such as creating or restoring wetlands or nesting islands, could be undertaken within this precinct subject to all relevant approvals.

Marine services and recreation precinct

Figure 15 – Marine services and recreation precinct



Purpose

The purpose of the **Marine services and recreation precinct** is to provide for a range of maritime activities, associated marine industries and recreational areas. The precinct will provide direct access to the harbour for tourism and recreational activities, including commercial fishing and facilities to support cruise ship passengers.

Within this precinct, public access to the waterfront and the harbour (including boat ramps, marina, open space and community facilities) will be provided and maintained where it does not compromise public safety or the security of port operations, or result in adverse impacts on environmental values.

Description

This precinct includes:

- Gladstone marina facility and surrounding parklands
- part of Auckland Inlet
- Auckland Inlet marine facilities
- Central Queensland University campus
- East Shores recreational hub.

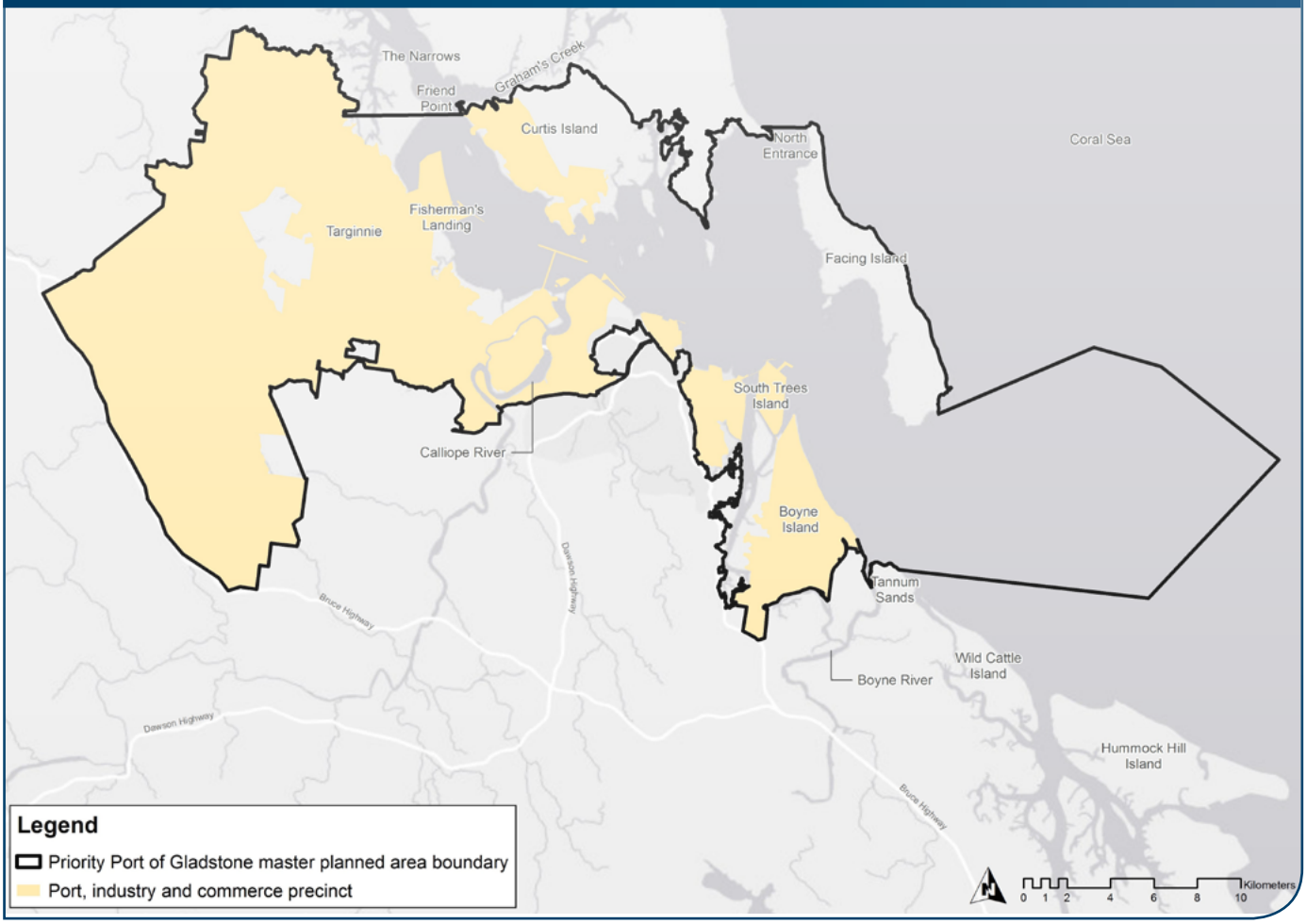
Outcomes

Development within this precinct includes marina activities and associated marine industries, small boat harbour, coastal rescue services, commercial, light industry, educational facilities, public open space and public access to the waterfront and harbour.

Development must not compromise public safety, or the security and potential future expansion of port operations.

Port, industry and commerce precinct

Figure 16 – Port, industry and commerce precinct



Purpose

The purpose of the **Port, industry and commerce precinct** is to provide for port operations, industry, port-related commercial activities and other supporting or related development.

Description

A significant portion of this precinct incorporates the GSDA, which contains defined development precincts to manage and regulate industrial, port-related, and supporting land uses (refer GSDA development scheme). The GSDA contains important infrastructure corridors to connect industry to the Port of Gladstone via the GSDA.

This precinct includes:

- land within the GSDA
- land within the GRC local government area
- some existing SPL
- some future SPL.

Outcomes

Development within this precinct provides for a range of industries which are of regional, state, national and global economic significance, and supply chain infrastructure that supports the operation of the port and industry. For example, uses in this precinct may include manufacturing industries, refineries, warehouses, wholesale trade, transport services, distribution centres and associated residue storage and waste management facilities.

The precinct may include associated infrastructure required for daily operations of the port such as security, customs and quarantine requirements, parking facilities, utility installations, and materials transportation infrastructure to support industry.

This precinct may also include other development that does not compromise the existing and future expansion of port operations, port-related industry and supply chain infrastructure, including:

- commercial operations, including storage of goods, and rural and agricultural uses that may act as a buffer to external sensitive receptors
- extraction of extractive resources and minerals, and forestry
- areas that may be suitable for the beneficial reuse of dredged material (which are likely to be required within the timeframe of the master plan), subject to all relevant approvals
- locations that accommodate safe, direct public access to the waterfront and harbour (such as boat ramps).

Part D: Environmental management framework

Overview

The Ports Act establishes a legislative framework for the development of an EMF for a priority port. The EMF describes the interaction of the port and port-related development with environmental values[11]. The EMF identifies environmental values that relate to the natural, cultural and social environments with a focus on matters of national environmental significance (MNES), matters of state environmental significance (MSES) and the environmental values that contribute to the local expression of the OUV of the GBRWHA.

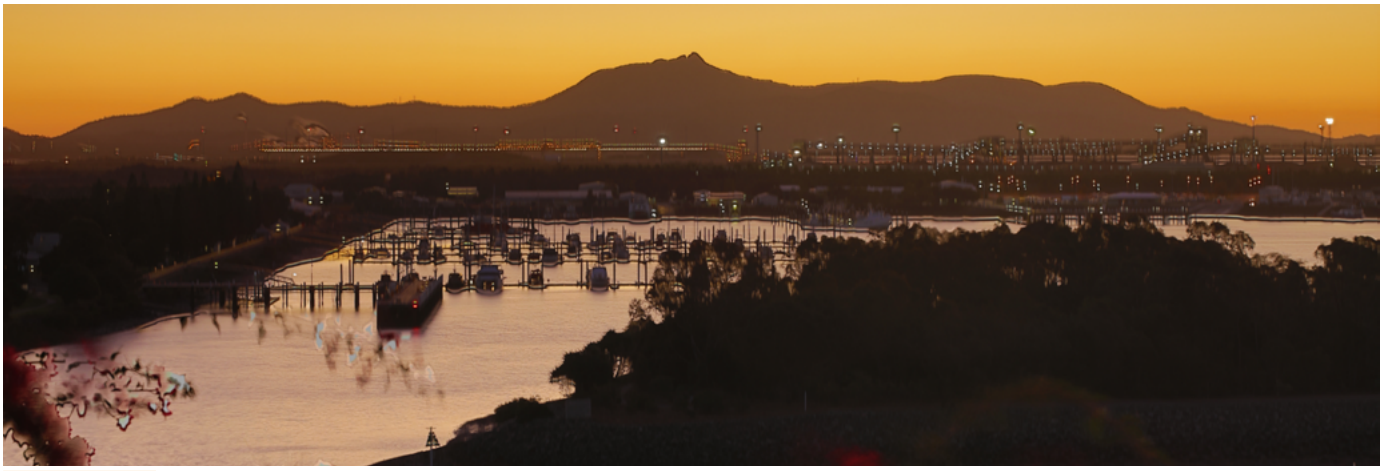
The role of the EMF, as defined in the Ports Act, includes:

- **identifying environmental values**, including defining and mapping environmental values in the master planned area and surrounding areas, including those that contribute to the OUV of the GBRWHA
- **identifying any potential impacts** that development in the master planned area may have on environmental values
- **managing potential impacts** by stating objectives and measures (the PMMs) for managing the impacts that have been identified.

The EMF adopts the environmental management hierarchy of avoid, mitigate and/or offset. In the first instance, development should avoid any potential impacts on environmental values. Where avoidance is not practicable (within the context of the principles of ESD), mitigation measures are implemented to reduce the extent, severity and/or duration of potential impacts on environmental values as a result of the development. If a development, after applying all practicable avoidance and mitigation measures, results in a significant residual impact on an environmental value, an offset may be required in accordance with Commonwealth and state legislation and policies.

An environmental risk assessment of potential development activities was undertaken to identify potential impacts on the environmental values within and surrounding the master planned area. This assessment considered the existing Commonwealth and state legislation, state and local planning instruments, operational environmental management measures and approval processes, and their effectiveness in managing potential impacts on environmental values from development.

Environmental values within and surrounding the master planned area were identified through a review of all relevant documents, publicly available databases, statutory mapping and EIS technical reports prepared in accordance with state and Commonwealth legislation. Information from new validated data sources (such as recent field surveys) was added as part of the process. Consultation with stakeholders and data custodians occurred to confirm the accuracy of information.



[11] Environmental values are defined under the *Environmental Protection Act 1994*.

Environmental values within and surrounding the master planned area

Land and marine areas within and surrounding the master planned area include environmental values of national and state importance, and are recognised and protected through Commonwealth and state legislation.

The master planned area contains important seagrass meadows (coastal and deep water meadows), coral reef habitats and extensive intertidal habitats (including mangroves, coastal saltmarshes and tidal estuaries). These marine and intertidal habitats support a range of fauna species, including dugong, inshore dolphins, marine turtles, migratory and resident shorebirds, and a diverse range of fish species.

A diverse range of terrestrial habitats are present within the master planned area and surrounds, including inshore continental islands such as Curtis and Facing islands, rivers and wetlands, remnant terrestrial vegetation communities, and Mount Larcom which is a prominent landform in the master planned area.

A large portion of the master planned area is situated within the Great Barrier Reef World Heritage Area.

Mapping of the environmental values that contribute to the OUV of the GBRWHA, as well as other environmental values within the master planned area and surrounding areas is provided in **Appendix B**. It is recognised there may be other environmental values within and surrounding the master planned area including those that cannot be mapped (for example air and water quality) and sites of cultural significance not yet identified.

The evidence base process identified which of these values contribute to the local expression of OUV and which are other environmental values important to the master planned area.

Environmental values that contribute to the local expression of Outstanding Universal Value

A large portion of the master planned area is situated within the GBRWHA. These areas contain habitat for a diverse range of flora and fauna species that contribute to the local expression of the OUV of the GBRWHA. To ensure OUV is an intrinsic consideration in priority port planning, management and governance, an evidence-based assessment was undertaken to identify the local expression of OUV, relative to the whole GBRWHA[12]. This assessment builds on the OUV attributes identified in the Independent Review and seeks to provide further clarification on how these attributes are expressed at the Port of Gladstone.

Table 6 summarises the local attributes and the associated environmental values for the priority Port of Gladstone—within and surrounding the master planned area.

Contribution classifications in **Table 6** vary for each world heritage criterion and specific environmental values. The classifications relate to the attributes' significance relative to the whole GBRWHA and do not change any conservation listings under legislation or conventions, condition/trends in outlook reports, status in the retrospective statement of OUV or otherwise. It is recognised all attributes contribute to the structure and diversity of the local ecosystem.

The classifications used in **Table 6** are generally defined as:

- **Minor contribution:** The attribute is present however it occurs in low abundance or singularly and is:
  - not essential to the sustainability of the attribute (for example substantial breeding population)
  - not recognised as a key feature of the GBRWHA
  - not included in the retrospective statement of OUV
  - not iconic, unique or a high quality example of the attribute.
- **Moderate contribution:** The attribute occurs in moderate abundance or across a moderately large area but is not the prime occurrence or representation of the attribute within the GBRWHA. The attribute does however represent a feature for which the Great Barrier Reef was listed as World Heritage.
- **Significant contribution:** The attribute represents locally important examples of the attribute relative to the nature of the attribute across the GBRWHA. Such an attribute may be specifically referred to within the retrospective statement of OUV for the GBRWHA or defined by other legislation, planning instrument or values assessment (for example in Great Barrier Reef Outlook Report). The occurrence of the attribute locally is a prime example of the features mentioned in the retrospective statement of OUV.

Further detail on the classifications and the evidence-based approach to the OUV assessment is outlined in **Appendix C.**

[12] The master planned area contributes approximately 0.1% of the total area of the GBRWHA.

Table 6 – Local attributes and environmental values that contribute to the OUV of the GBRWHA

Local attribute	Contribution classification[13] and key environmental values
Coral reefs	**Minor contribution to the OUV of the GBRWHA** Fringing and inshore turbid reefs are present within and surrounding the master planned area, including on the seaward side of Curtis Island and Facing Island, coral reefs associated with Seal Rocks, Turtle Island Reef, Bushy Reef and Manning Reef. Several reef communities within the Port of Gladstone exist within naturally (and anthropogenically affected) high ambient turbidity conditions and light-limited environments. Coral species diversity in and surrounding the master planned area are generally limited to those coral taxa tolerant or semi-tolerant to turbid conditions such as faviids, turbinaria, poritids, acropora and soft corals. These species are typical of fringing and turbid coral reefs of the southern inshore Great Barrier Reef.
Marine water quality	**Moderate contribution to the OUV of the GBRWHA** The marine and estuarine waters of the master planned area and surrounds are predominantly described as 'moderately disturbed' (in terms of management intent/level of protection), with the exception of the coastal waters which are described as 'slightly to moderately disturbed', and The Narrows which are of 'high ecological value'. Although the marine water quality is slightly to moderately disturbed, it is critical to support and sustain the local expression of several attributes contributing to the OUV of the GBRWHA, including reef communities, seagrass meadows, fish species diversity and habitat, marine mammals, marine turtles, migratory shorebird habitat, and the total diversity of marine life.
Fish	**Minor contribution to the OUV of the GBRWHA** The master planned area and surrounding areas provide a diversity of important fish habitat (for example reefs, mangroves, seagrass meadows). There are two declared fish habitat areas adjacent to the master planned area: Dē-răl-lĭ (Calliope River) and Colosseum Inlet. Estuarine and coastal fish species are known within the master planned area, including potential habitat for conservation significant fish species. However, the master planned area is not currently recognised as critical habitat for any threatened fish species.
Marine megafauna	**Minor to significant contribution to the OUV of the GBRWHA** Dugong, Australian humpback dolphin, and humpback whales have all been recorded within and/or surrounding the master planned area in varying numbers and often on a seasonal basis. The master planned area supports a resident population of dugong (estimated in the low hundreds). Seagrass meadows within the master planned area and surrounds provide important connectivity habitat between larger dugong habitat areas at Shoalwater Bay to the north and Hervey Bay to the south. The area between Rodds Bay and The Narrows is a declared dugong protection area, in recognition of the importance of the seagrass meadows to dugong populations. The Australian humpback dolphin is known to frequent the port and is considered to be one of the important locations for this species within the context of the GBRWHA. The Australian snubfin dolphin is considered unlikely to inhabit the master planned area but has been recorded around Port Alma, approximately 35 kilometres north of the master planned area. Humpback whales and calves are known to utilise the port and surrounding offshore waters during seasonal migrations. The master planned area is not recognised as critical or protected habitat for this species.
Marine turtles	**Minor to moderate contribution to the OUV of the GBRWHA** Several marine turtle species have been recorded within the master planned area. Of these, flatback and green turtles are the most commonly recorded. Nesting beaches are present on Facing, Curtis and Wild Cattle islands, Boyne Island Beach, Hummock Hill Island and Tannum Sands, with South End identified as an index nesting beach. Curtis Island provides an important nesting beach for the flatback turtle, which is endemic to the east Australian continental shelf. South End beach is listed as one of four key rookeries for this species.

[13] The local attributes contribution classifications vary for each world heritage criterion. For further information, refer to Appendix C.

Local attribute	Contribution classification[13] and key environmental values
Seagrass and macroalgae	**Minor to moderate contribution to the OUV of the GBRWHA** Coastal and deep water seagrass meadows are present within the master planned area, representing seven different species of seagrass. Seagrass meadows in the region are ephemeral and changes in seagrass abundance, species composition and biomass will occur over different seasons. Key seagrass meadows are located at Pelican Banks North, Pelican Banks South, Facing Island and Quoin Island. Seagrass and macroalgae, including beds of *Halimeda* algae, provide important habitat for a range of marine fauna in the master planned area, including dugong, inshore dolphins, marine turtles and fish species.
Shorebirds and migratory birds	**Minor to significant contribution to the OUV of the GBRWHA** The master planned area contains large areas of potential habitat for both resident and migratory shorebirds, including foraging and roosting habitat in intertidal and subtidal areas along the coastline. There are several important roost sites within the master planned area (which vary from year to year), including the Kangaroo Island wetland and important shorebird roosting habitat at Friend Point, North Passage and South Passage islands, Boyne Island Beach, shorebird habitat associated with Curtis Island, Facing Island and the other inshore islands. Several threatened migratory shorebirds are known to frequent the area. Marine waters within the master planned area provide potential foraging habitat for a range of migratory seabirds, however the area is not recognised as critical habitat for seabirds. No breeding habitat for migratory shorebirds or seabirds is present within the master planned area or surrounds.
Flora, fauna and ecological communities	**Minor to moderate contribution to the OUV of the GBRWHA** Several conservation significant flora and fauna species are known or highly likely to occur within the master planned area. These species are known from terrestrial, intertidal and marine habitats. Key conservation significant species occurring or potentially occurring in the master planned area and surrounds include: water mouse (*Xeromys myoides*), yellow chat (*Epthianura crocea macgregori*), cassowary (*Casuarius johnsonii*), and quassia (*Samadera bidwillii*). All of these species are listed under the provisions of the EPBC Act and/or the *Nature Conservation Act 1992* (NC Act). Three threatened ecologically communities (TECs) are present within and surrounding the master planned area and are associated with intertidal areas, coastal dunes and watercourses. The Subtropical and Temperate Coastal Saltmarsh TEC covers the largest area (approximately 2282 hectares within the master planned area), and is associated with intertidal areas, often in areas adjacent to mangrove communities. This community is listed as vulnerable under the provisions of the EPBC Act. Intact, remnant mangrove forests are important habitats and ecosystems within the master planned area, with key forests located in The Narrows, along the coastline between Fisherman's Landing and Wiggins Island, South Trees Inlet, Boyne Island Beach, and along the coastline of the continental islands. The master planned area supports a diverse range of mangrove species, with 13 species recorded within the Port of Gladstone.
Continental islands	**Moderate to significant contribution to the OUV of the GBRWHA** There are a number of continental islands within the master planned area, including Curtis and Facing islands, and several smaller inshore islands such as Quoin, Compigne, Turtle, Diamantina, Witt, Tide, Picnic, She Oak, Rat and Garden islands, and Bushy Islet. Curtis Island is the largest continental island in the GBRWHA (by land area) and is recognised as having high terrestrial flora species diversity with more than 500 species. Curtis Island is important as it contains a high level of flora species diversity, and represents a key example of the unique island vegetation communities on islands in the GBRWHA. Other islands in the master planned area and surrounds are likely to support the similar floristically diverse communities, however there is limited available and relevant information for these islands. The continental islands also provide unique habitats within the master planned area, such as beaches, cliff and shoreline platforms, beach ridges, swale systems, parabolic dunes and coral reef platforms.

Local attribute	Contribution classification[13] and key environmental values
Geomorphology	**Minor contribution to the OUV of the GBRWHA** Features such as beaches, dune systems, and river deltas are important geological features within the master planned area and surrounds. The Narrows is a key example of cross-shelf connectivity. It is one of only four tidal passages in Australia and separates Curtis Island from the mainland. The only other tidal passage in the GBRWHA is the Hinchinbrook Channel (approximately 800 kilometres north of Gladstone). The parabolic dunes near Cape Capricorn on Curtis Island are viewed as regionally significant examples of landscape formation and evolution and include a natural sand blow at Yellow Patch (north eastern Curtis Island). Marine tidal sand deltas at the mouth of the Boyne River and Colosseum Inlet are local examples of the fine sediments transported along the coast by longshore drift, and deposited at the mouth of estuaries.
Cultural heritage	**Moderate contribution to the OUV of the GBRWHA** The master planned area and surrounds contain a number of culturally significant sites, and provide access to areas enabling traditional Aboriginal use of land and sea. There may also be other sites not yet recorded. The Bailai, Gurang, Gooreng Gooreng and Taribelang Bunda Peoples have native title of lands and islands in the master planned area. Additionally, they have formalised their aspirations for sea and country through entering into a Traditional Use of Marine Resource Agreement (TUMRA) which encompasses the master planned area, as well as the Capricorn-Bunker Group of reefs, cays and islands.
Marine fauna	**Minor to moderate contribution to the OUV of the GBRWHA** A diverse range of marine fauna species occur in the master planned area and surrounds, including marine mammals, marine turtles, and estuarine and reef fish communities. A range of habitats support the diversity of marine species present, including seagrass meadows, reefs, soft sediment habitats, mangrove communities, estuaries, deep water habitats and intertidal areas.
Total species diversity	**Moderate contribution to the OUV of the GBRWHA** Diversity of available habitat types contribute to the diversity of marine species within the master planned area and surrounds. Marine habitat areas include coral reefs, seagrass meadows, mangrove communities, hard and soft benthic substrates and beach habitats. Although the marine habitats within the master planned area are not considered to be individually unique in the context of the whole GBRWHA, they do collectively represent a unique inshore system, supporting fauna species considered to significantly contribute to the OUV of the GBRWHA (that is, dolphins and migratory shorebird species).

Other environmental values

Separate to the OUV of the GBRWHA, there are a number of other important environmental values within the master planned area.

Table 7 summarises the other environmental values within and surrounding the master planned area that are environmentally significant but do not contribute to the OUV of the GBRWHA, as determined during the evidence base assessments. Refer to **Appendix B** for environmental values mapping.

Table 7 – Other environmental values within and surrounding the master planned area

Environmental value	Description
Water quality	Sources of fresh water and groundwater, their quality and the ecosystem services they support (for example watercourses providing habitat for flora and fauna species).
Terrestrial flora and fauna **Intertidal flora and fauna** **Marine flora and fauna**	Flora and fauna species and ecological communities not contained within the GBRWHA or not considered to contribute to the OUV of the GBRWHA (for example vegetation communities or fauna habitat located outside of the Great Barrier Reef coastal zone, such as flora and fauna habitat within the Aldoga area).
Protected areas	A range of protected areas (for example National Parks, Conservation Parks and State Forests) are present within the master planned area and surrounds as listed under the provisions of Commonwealth and state legislation.
Heritage properties	World, Commonwealth and National Heritage Places and state and local heritage places.
Social	Community infrastructure and facilities, local workforce, housing and accommodation.
Recreational opportunities and natural scenic amenity	Areas utilised for conservation, environmental management, tourism, open space, and sport and recreational uses. This also includes areas that provide natural scenic amenity.
Cultural heritage	Culturally important areas, interactions or sites considered not to contribute to the OUV of the GBRWHA (for example Aboriginal and Torres Strait Islander cultural heritage sites located outside of the GBRWHA and associated Great Barrier Reef coastal zone, Indigenous Land Use Agreements, Native Title determination areas and other areas where native title rights and interests continue).

Potential impacts from development on environmental values

Development within the master planned area has the potential to impact (direct, indirect and cumulative) on environmental values (natural, cultural and social) in the master planned area and surrounding areas.

Potential impacts have been identified based on potential development activities that may be needed to support infrastructure and supply chains within the master planned area to the year 2050. These activities[14] were identified based on the historical operation of the port, current land uses, potential growth, environmental values, and precinct/zone purposes within existing planning instruments.

The following development activities were identified as having the potential to impact on environmental values within and surrounding the master planned area:

- capital dredging
- establishment of reclamation areas for the beneficial reuse of dredged material
- construction of new industries and/or expansion of existing industries
- construction of supply chain infrastructure to support port-related development
- increased vessel movements.

These activities were subject to a risk assessment to determine the likelihood and consequence of potential impacts from development on the environmental values. Where a development activity location was unknown, the potential impacts assumed the highest conservation significance of the value. Potential impacts identified during the risk assessment for environmental values within and surrounding the master planned area are included in **Appendix D**.

The potential impacts from development have been identified at a high level for the purpose of the master planning process due to the:

- large spatial extent of the master planned area
- wide range of activities that could potentially occur within the precincts
- long-term planning horizon to 2050
- varying sensitivities and biological traits of environmental values.

Appendix D does not identify impacts to individual environmental values but refers to six broad categories. This is because the specific locations of development that may occur prior to the year 2050 are unknown. Detailed project-level impact assessments in particular locations on specific environmental values, including assessment of cumulative impacts, will still need to be undertaken through the appropriate development assessment pathways.

[14] Potential development activities were considered as assumptions only and all project proposals will still require detailed assessment

Managing impacts

The approach for managing impacts through master planning involves regulating development by exception only, where requirements for port-related development are necessary. This recognises that existing planning and regulatory frameworks across all levels of government provide a comprehensive system for the management of environmental impacts.

Potential impacts are currently managed through:

- local, state and Commonwealth, government regulatory approval processes (project and site specific), including statutory land use planning instruments
- existing operational management measures (for example, environmental monitoring, environmental management plans implemented by landholders, regulators and proponents).

The environmental risk assessment considered the existing Commonwealth and state legislation, state and local planning instruments, operational environmental management measures and approval processes in managing potential impacts on environmental values from development.

This assessment sought to identify:

- gaps in the existing processes that would address potential impacts associated with development within the master planned area
- inconsistencies in the implementation of existing processes over the master plan timeframe
- existing measures implemented on a voluntary basis.

This assessment determined that the existing statutory requirements and other operational environmental management measures are sufficient and will continue to manage environmental impacts within the master planned area. However, a number of additional objectives and measures were identified to supplement the existing system. As described in the EMF objectives and priority management measures (PMMs) sections below, these objectives and measures are required to promote the continuation of non-statutory measures and to enable consistent management of OUV across the master planned area.

This recognises the outcomes sought by the Environmental Management Framework are in many cases already achieved through existing provisions and reduces duplication.

The master plan adopts an approach that follows the management hierarchy of avoiding and mitigating impacts on environmental values. Where this cannot be reasonably achieved then significant residual impacts should be offset in accordance with relevant state and Commonwealth policies. This considers direct, indirect and cumulative impacts. This is achieved through implementation of existing legislation, the EMF objectives and PMMs, and the port overlay.

EMF objectives

EMF objectives have been identified for each of the master planned area precincts to avoid, mitigate and/or offset potential impacts from development within the master planned area on environmental values, including the OUV of the GBRWHA, MNES and MSES. The EMF objectives for each of the master planned area precincts are provided in **Appendix E**.

The EMF objectives contribute to achieving the master plan's strategic vision, objectives, desired outcomes and state interests.

The port overlay gives regulatory effect to the EMF objectives to ensure they are considered by assessment managers.

Priority management measures

As described above, a comprehensive assessment of the existing statutory requirements and operational environmental management measures that apply to the master planned area was undertaken as part of master planning.

Due to the comprehensive nature of statutory requirements implemented within the master planned area, limited PMMs are required for the master planned area. The PMMs are stated below in **Table 8**[15]. This recognises the outcomes sought by the EMF are in many cases already achieved through existing provisions and reduces duplication.

The following PMMs have been identified to promote the continuation of non-statutory measures and to enable consistent management of OUV across the master planned area. All existing statutory requirements will continue to apply to development within the master planned area and the master plan does not change the role of regulators.

[15] Section 21 of the Ports Act requires that the port overlay state how the PMMs are to be achieved, including the responsible entity.

Table 8 – Priority management measures

Priority management measures	Master planned area precinct						
	Environmental management	Infrastructure and supply chain corridors	Interface	Marine	Marine infrastructure	Marine services and recreation	Port, industry and commerce
1. Aboriginal cultural heritage notification Prior to undertaking any ground disturbance activities within the master planned area, proponents who are not already required to undertake notification under the provisions of the *Aboriginal Cultural Heritage Act 2003*, an Indigenous Land Use Agreement registered under the *Native Title Act 1993*, an agreement made under section 31 of the *Native Title Act 1993* and other agreements with an Aboriginal Party under the *Aboriginal Cultural Heritage Act 2003*, will notify the relevant Aboriginal party prior to the works being undertaken.	Yes	Yes	No	Yes	Yes	Yes	Yes
2. Environmental values monitoring and reporting program Prepare an environmental values monitoring and reporting program for the environmental values within and surrounding the master planned area that will be impacted by development within the master planned area.	Yes	Yes	Yes[16]	Yes	Yes	Yes	Yes
3. Environmental assessment guideline Prepare an environmental assessment guideline for development likely to have a significant adverse impact on the environmental values that contribute to the OUV of the GBRWHA. This guideline will seek to ensure environmental assessment processes are appropriately and consistently applied across the master planned area for matters relating to the OUV of the GBRWHA and other environmental values.	Yes	Yes	Yes[16]	Yes	Yes	Yes	Yes
4. Land management plan guideline Prepare and implement a land management plan guideline to ensure the OUV of the GBRWHA and other environmental values are consistently identified and managed within the environmental management precinct of the master planned area.	Yes	No	No	No	No	No	No
5. Facing Island land management plan Prepare and implement a land management plan for the Facing Island land management plan area in accordance with the land management plan guideline.	Yes	No	No	No	No	No	No
6. Inshore islands land management plan Prepare and implement a land management plan for the Inshore islands land management plan area in accordance with the land management plan guideline.	Yes	No	No	No	No	No	No
7. Mount Larcom landform land management plan Prepare and implement a land management plan for the Mount Larcom landform land management plan area in accordance with the land management plan guideline.	Yes	No	No	No	No	No	No
8. Aldoga reserve land management plan Prepare and implement a land management plan for the Aldoga reserve land management plan area in accordance with the land management plan guideline.	Yes	No	No	No	No	No	No
9. Curtis Island land management plan Prepare and implement a land management plan for the Curtis Island land management plan area in accordance with the land management plan guideline.	Yes	No	No	No	No	No	No

[16] This applies only to SPL within the interface precinct, not residential properties.

Part E: Master plan implementation

The master plan is a strategic document implemented through a separate port overlay. The port overlay provides regulatory effect for the master plan by regulating development within the master planned area through existing planning instruments.

The following planning instruments currently regulate development within the master planned area:

- GPC LUP (under the *Transport Infrastructure Act 1994*)
- the GRC planning scheme (under the *Planning Act 2016*)
- the GSDA development scheme (under the S*tate Development and Public Works Organisation Act 1971*).

The assessment triggers and benchmarks in the *Planning Regulation 2017* may also apply within the master planned area.

The port overlay only regulates development by exception and operates in addition to existing planning instruments, where further requirements are necessary to implement the master plan.

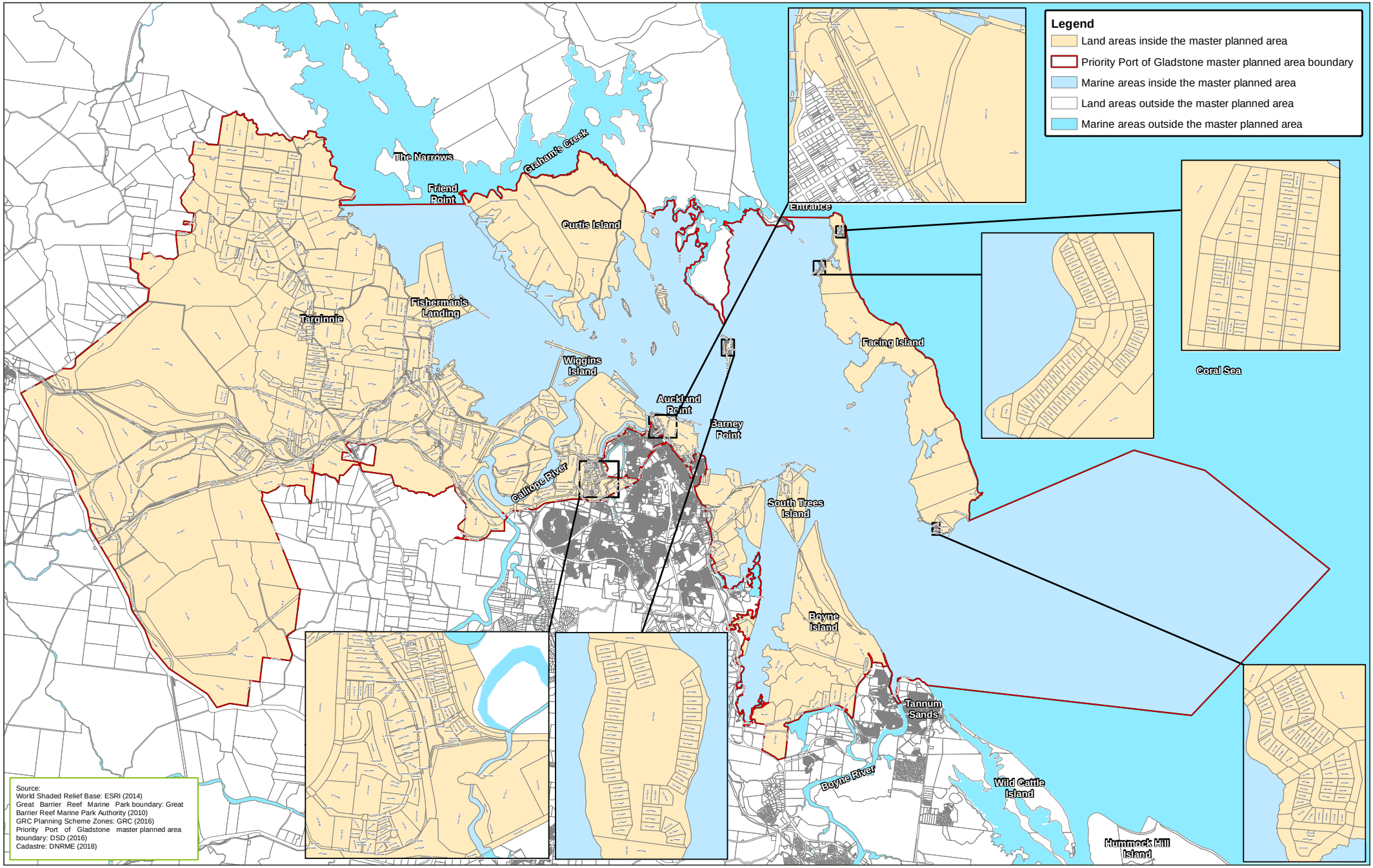
This recognises outcomes sought by the master plan are in many cases already achieved through existing provisions, reduces duplication of provisions and minimises the potential for conflict between provisions that operate under different legislative heads of power.

The master plan and port overlay do not replicate, replace or remove any existing processes. These instruments also do not modify decision making for existing planning and other regulatory entities in relation to the respective planning instruments and environmental legislation that applies to areas within the master planned area.

The port overlay cannot regulate development that is regulated by the GSDA development scheme.

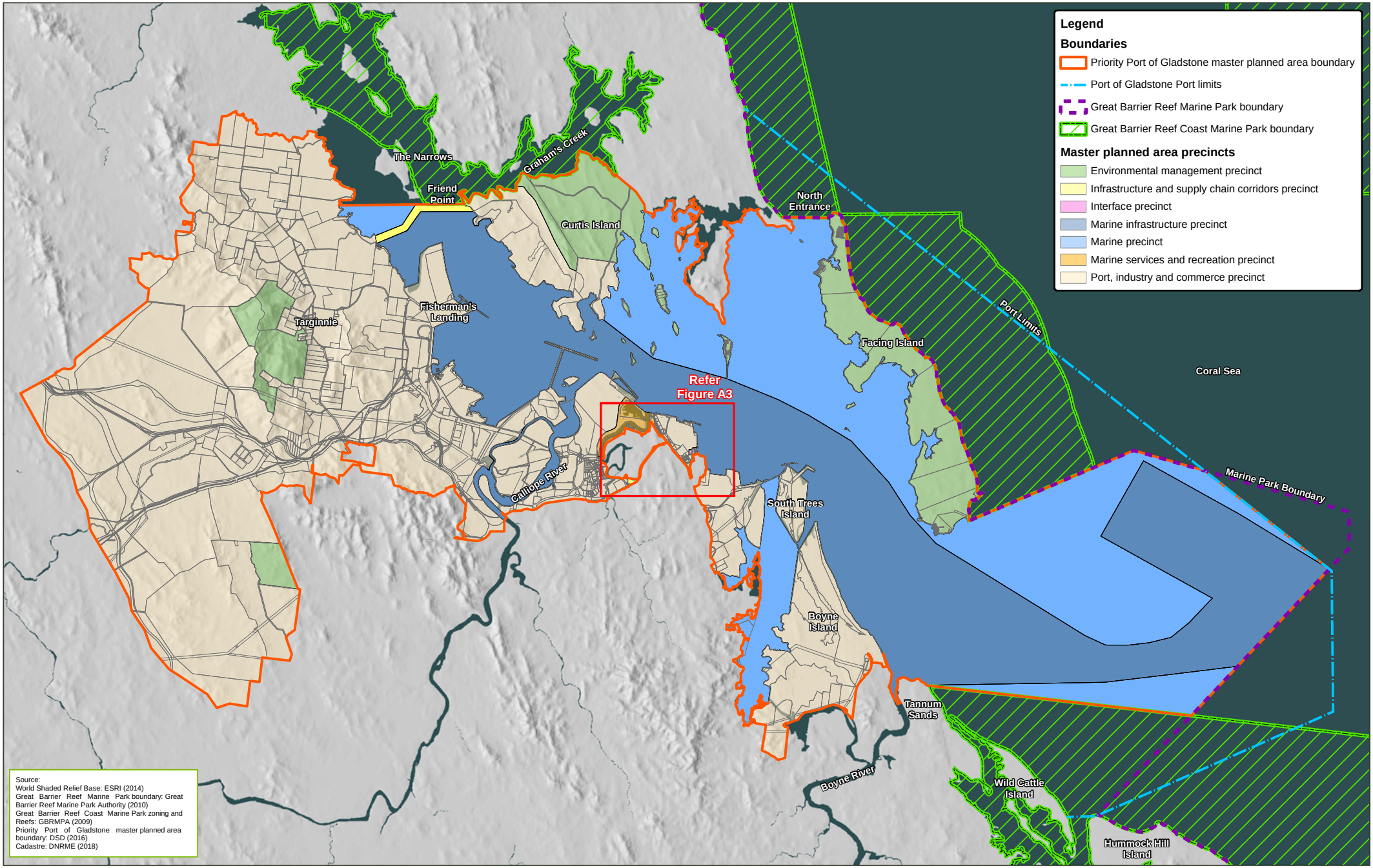
Appendices

Appendix A
Priority Port of Gladstone master planned area



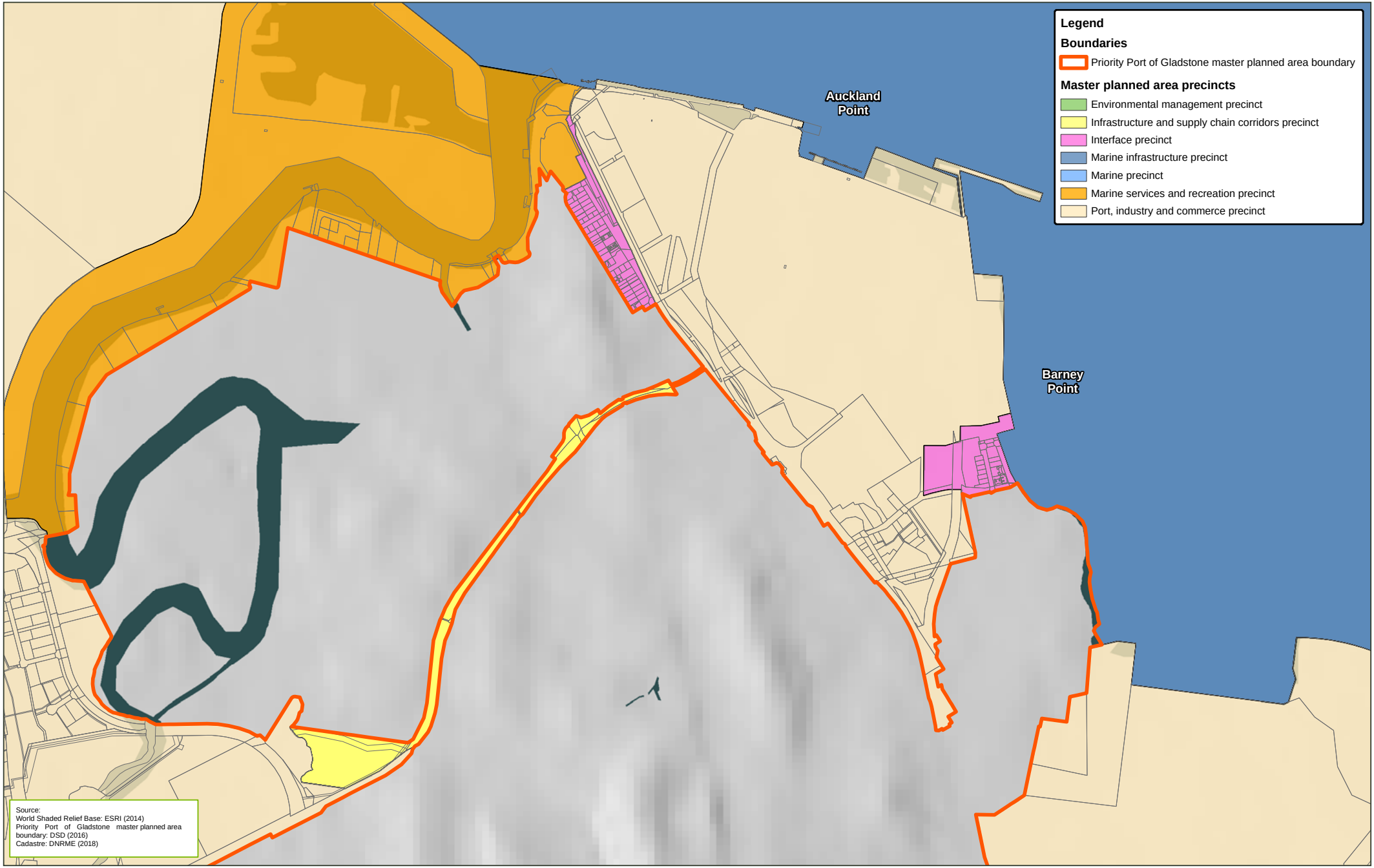
Coordinate system: GDA 1994 MGA Zone 56

Figure A1: Priority Port of Gladstone master planned area – regulation map



Coordinate system: GDA 1994 MGA Zone 56

Figure A2: Priority Port of Gladstone master planned area precincts



Master plan for the priority Port of Gladstone

Figure A3: Priority Port of Gladstone master planned area precincts (inset)

Appendix B
Mapping of the OUV of the GBRWHA and other environmental values

The mapping in this appendix has been prepared using existing datasets available at the time. While some of these datasets have been synthesised using field collected data, it is acknowledged some of the datasets are the result of desktop studies. Not all mapping has been confirmed through field surveys.

Data sources are referenced on each map and detailed in **Table B1**[18] below. Mapping has been prepared on the best data available.

Some mapping has been prepared over a period of time to account for seasonal variability of environmental values (for example, seagrass meadows or shorebird roosts). Similarly, some mapping has been prepared based on data from varying periods of time and for varying numbers of environmental values. As such mapping should be considered indicative only.

The mapping presented in this appendix is not exhaustive, and there may be other areas of environmental or cultural value not specifically identified.

It is acknowledged datasets will be updated over time. Following release of the master plan the mapping in this appendix may not be current. Project proponents and government regulators should not use this as a single assessment source and should refer to mapping as guidance only.

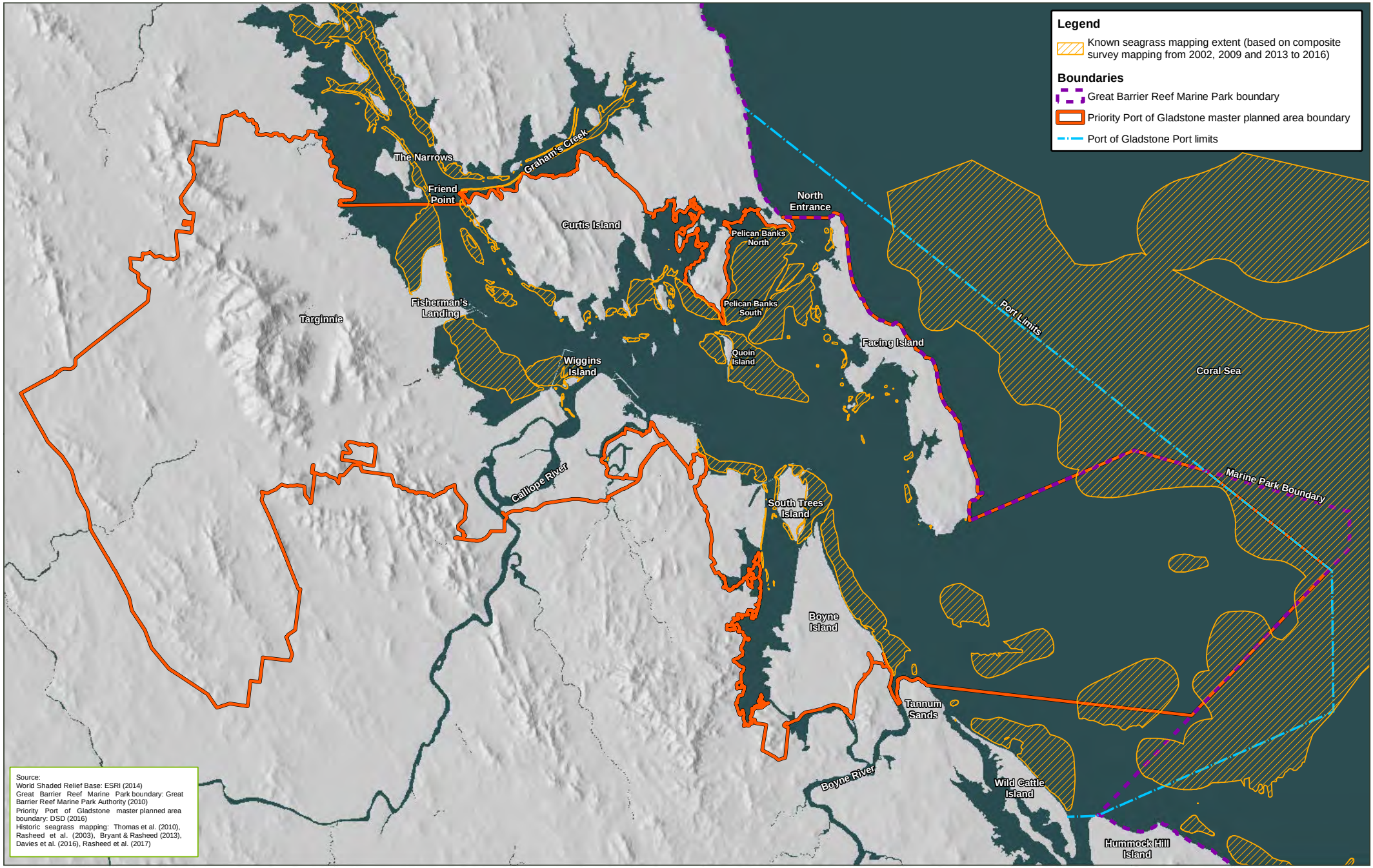
Table B1 – Mapping datasets and sources

Figure title	Key dataset/s	Source/s
Figure B1: Seagrass	Historical seagrass mapping	Thomas et al. (2010); Rasheed et al. (2003); Bryant and Rasheed (2013); Davies et al. (2016); Rasheed et al. (2017)
Figure B2: Coral	Indicative reef boundary	GBRMPA (2009a)
	Port Curtis Reef extent	Vision Environment (2015); BMT WBM (2014)
Figure B3a: Turtle nesting beaches	Turtle nesting areas	Coffey Environments (2013); Gladstone Regional Council (2016); Hodge et al. 2006; Jodi Jones pers. comms. (2017); Limpus et al. (2013)
	Turtle nesting data	Clifton & Bell (2000); Limpus & Gilmore (1999); Limpus et al. (2000); Limpus et al (2005); Limpus et al. (2006); Limpus et al. (2014); Limpus et al. (2016); Limpus et al. (2017); Reinhold et al. (1997)
Figure B3b: Green turtle tracking data during 2014, 2015, 2016 and 2017	Green turtle tracking data	Hamann et al. (2015a); Hamann et al. (2016); Hamann et al. (2017a)
Figure B3c: Green turtle tracking data (health and population data) during 2010 and 2017	Green turtle tracking data	Opportunistic data taken from ERMP study on turtle health during 2010 and 2017
Figure B3d: Core use areas of flatback turtles tracked during internesting period in 2013	Flatback turtle tagging data	Hamann et al. (2015b)
Figure B3e: Core use areas of flatback turtles tracked during internesting period in 2014	Flatback turtle tagging data	Hamann et al. (2015c)

[18] There are some datasets which are common across multiple maps including the Great Barrier Reef Marine Park Boundary (GBRMPA 2010) and cadastral boundaries (DNRME 2018c)

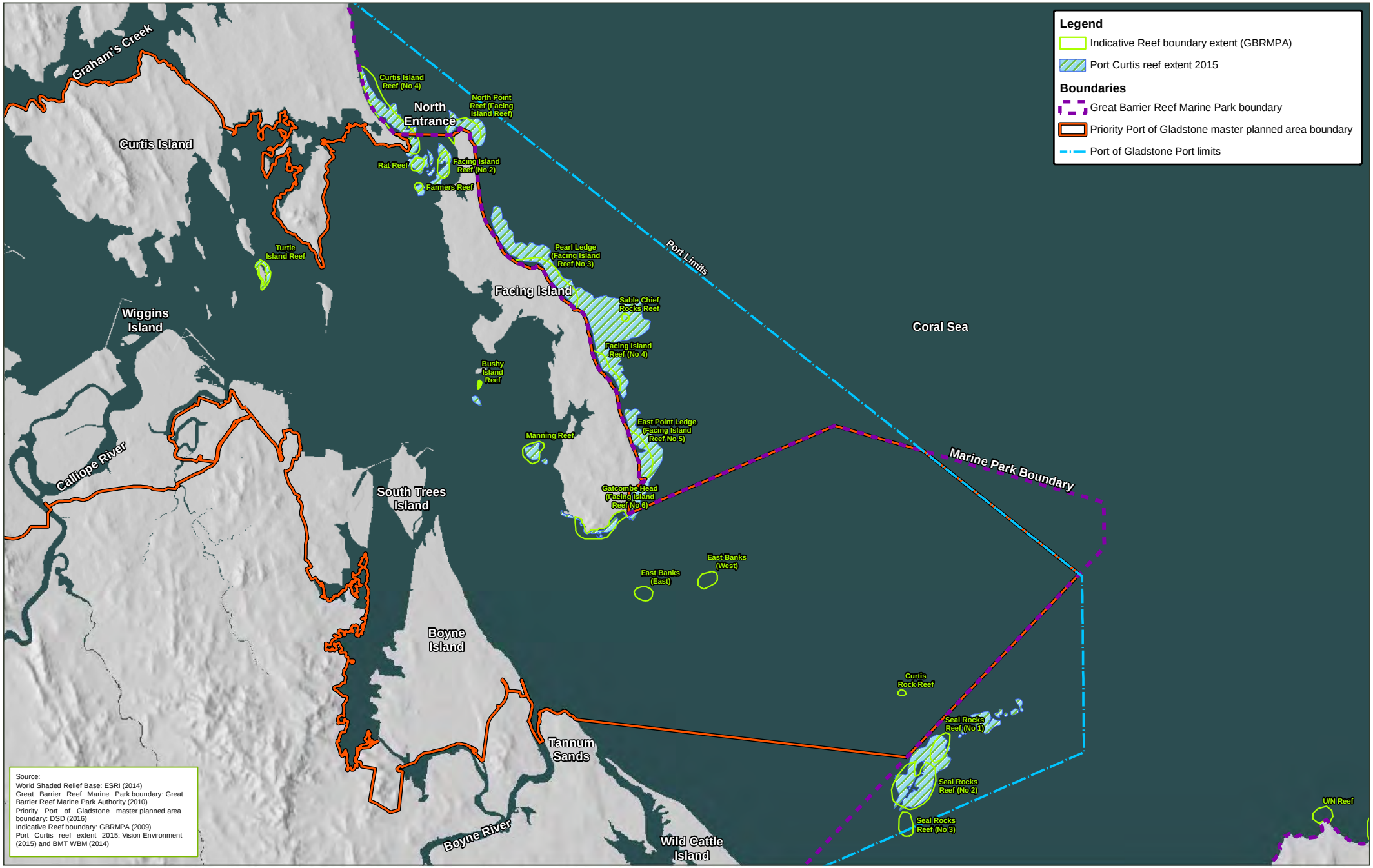
Figure title	Key dataset/s	Source/s
Figure B3f: Core use areas of flatback turtles tracked during internesting period in 2015	Flatback turtle tagging data	Hamann et al. (2017b)
Figure B4: Migratory shorebird habitat	Important roosts on the Curtis Coast (Wildlife Unlimited Annual Summer Survey)	Wildlife Unlimited (2013); Wildlife Unlimited (2015); Wildlife Unlimited (2016); Wildlife Unlimited (2017)
	Potential habitat for migratory shorebirds	Birdlife Australia (2015)
Figure B5: Marine and estuarine water types	Marine and estuarine waters (from the Environmental Protection Water Policy – Water Types Queensland)	DES (2017a)
Figure B6: Fish habitat areas and waterways providing for fish passage	Risk of impact on fish movement and communities regulated under the *Fisheries Act 1994*	DAF (2016)
	Fish habitat areas regulated under the *Fisheries Act 1994*	DES (2017b)
Figure B7: Rodds Bay Dugong Protection Area and relative dugong density based on aerial surveys (1986 to 2005)	Rodds Bay Dugong Protection Area	DAF (2015)
	Relative dugong density	Grech et al. (2011) cited in Sobtzick et al. (2013)
Figure B8: Migrating whales	Whale observations (database record)	NCRIS (2015)
Figure B9: Presence of *Halimeda* algae	Presence of *Halimeda* algae	McKenna et al. (2014)
Figure B10: Regional Ecosystems containing mangrove communities	Regional Ecosystems containing mangroves	DNRME (2018)
Figure B11: Known Indigenous cultural heritage sites regulated under the *Aboriginal Cultural Heritage Act 2003*	Known Indigenous cultural heritage locations	DATSIMA (2013)
Figure B12: *Nature Conservation Act 1992* listed threatened flora species records from the Queensland Herbarium Herbrecs database and protected plant survey 'high risk' trigger areas	Herbrecs data for threatened flora species	Queensland Herbarium (2016)
	NC Act protected plant survey high risk trigger areas	DES (2018g)
Figure B13: Threatened ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999*	Threatened ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999*	Based on DNRME (2018a)
Figure B14: Endangered and Of concern Regional Ecosystems as listed under the *Vegetation Management Act 1999*	Regional Ecosystem status under the *Vegetation Management Act 1999* – Endangered and Of concern communities	DNRME (2018a)
Figure B15: Least concern Regional Ecosystems as listed under the *Vegetation Management Act 1999*	Regional Ecosystem status under the *Vegetation Management Act 1999* – Least concern communities	DNRME (2018a)
Figure B16a: Benthic macroinvertebrate distribution and density cover	Benthic macroinvertebrate habitat regions and density cover	McKenna et al. (2014)
Figure B16b: Benthic macroalgae distribution and density cover	Benthic macroalgae habitat regions and density cover	McKenna et al. (2014)

Figure title	Key dataset/s	Source/s
Figure B17: Essential Habitat for threatened terrestrial flora and fauna species regulated under the *Vegetation Management Act 1999*	Essential habitat regulated under the *Vegetation Management Act 1999*	DNRME (2018b)
Figure B18: Matters of state environmental significance defined under the *Environmental Offsets Act 2014*	Matters of State Environmental Significance as defined by the *Environmental Offsets Act 2014*	DES (2017b); DES (2017c); DES (2017d); DES (2017e); DES (2017f); DES (2017g); DES (2017h); DES (2017i); DES (2018c); DES (2018d); DES (2018e); DES (2018f)
Figure B19: Wetlands as mapped in the Master Planning Evidence Base Assessment	Wetlands	AECOM (2016)
Figure B20: Directory of important wetlands	Directory of important wetlands	DEHP (2005)
Figure B21: Protected areas regulated under the *Nature Conservation Act 1992* and State Forests regulated under the *Forestry Act 1959*	Protected areas of Queensland	DES (2018a)
Figure B22: Biodiversity Planning Assessment areas mapped using the Biodiversity Assessment and Mapping Methodology	Biodiversity significance from BPA Assessments	DES (2016); DES (2018b)
Figure B23: Great Barrier Reef Marine Park Zones (Commonwealth)	Great Barrier Reef Marine Park Zones	GBRMPA (2009b)
Figure B24: Great Barrier Reef Coast Marine Park Zones (State)	Great Barrier Reef Marine Park Zones	GBRMPA (2009b)
Figure B25: Native title determination under the *Native Title Act 1993*	Native title determination under the *Native Title Act 1993*	NNTT (2018)
Figure B26: Coverage of Indigenous land use agreements notified or registered under the *Native Title Act 1993*	Indigenous land use agreements coverage area	NNTT (2018)
Figure B27: World, Commonwealth and National Heritage Places protected under the *Environment Protection and Biodiversity Conservation Act 1999* and Shipwrecks protected under the *Historic Shipwrecks Act 1976*	Protected Shipwreck (›75 years old)	DEHP (2016)
Figure B28: State heritage places protected under the *Queensland Heritage Act 1992* and local heritage places	State and Local Heritage Places	DEHP (2016); GRC (2015a)
Figure B29: Social and community infrastructure identified in the Gladstone Regional Council Planning Scheme	Community infrastructure and GRC Planning Scheme – Community facilities	GRC (2016)
Figure B30: Recreational opportunities and natural amenity as identified by the Gladstone Regional Council Planning Scheme	GRC Planning Scheme Zones	GRC (2016)



Coordinate system: GDA 1994 MGA Zone 56

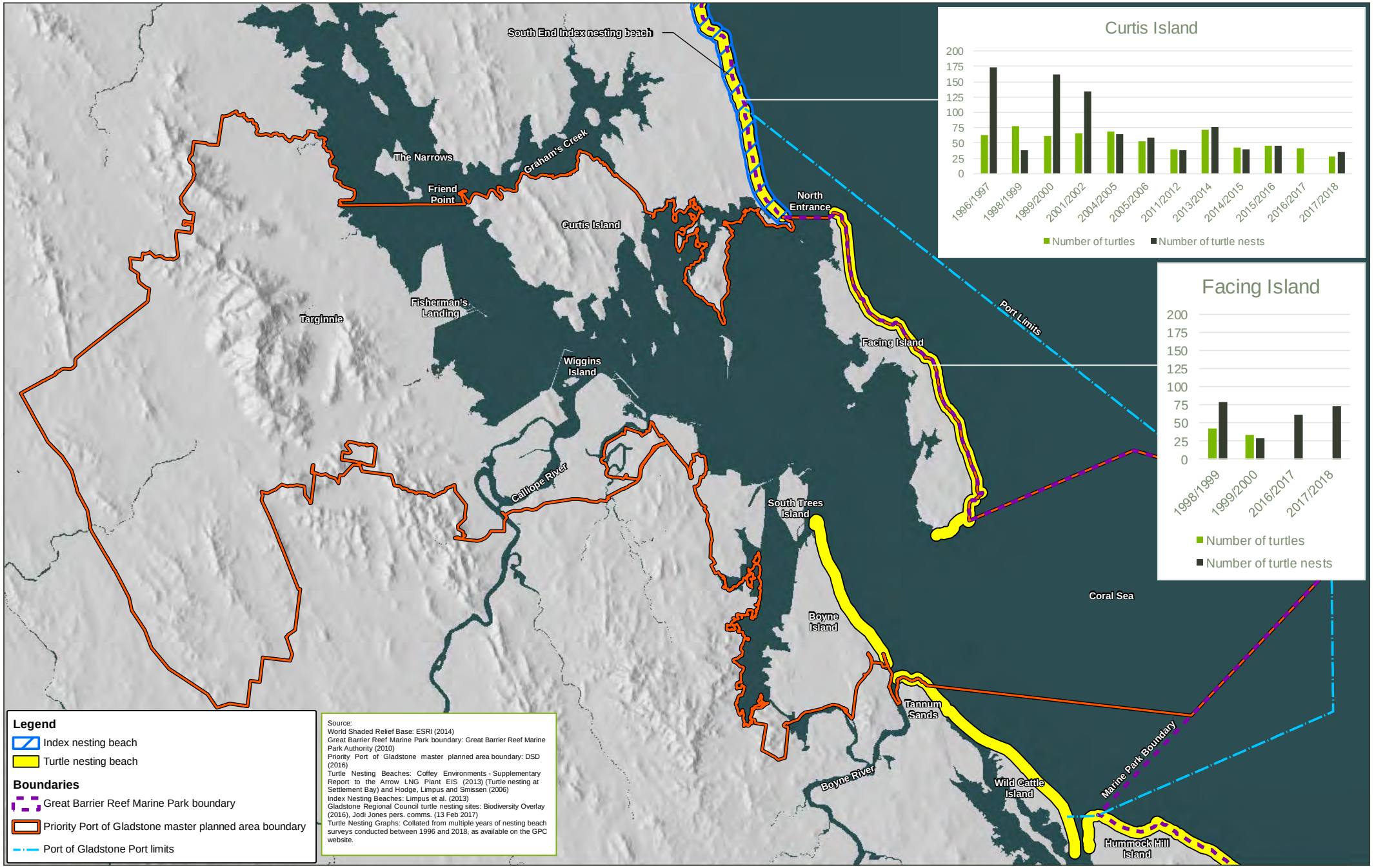
Figure B1: Seagrass



Coordinate system: GDA 1994 MGA Zone 56

Master plan for the priority Port of Gladstone

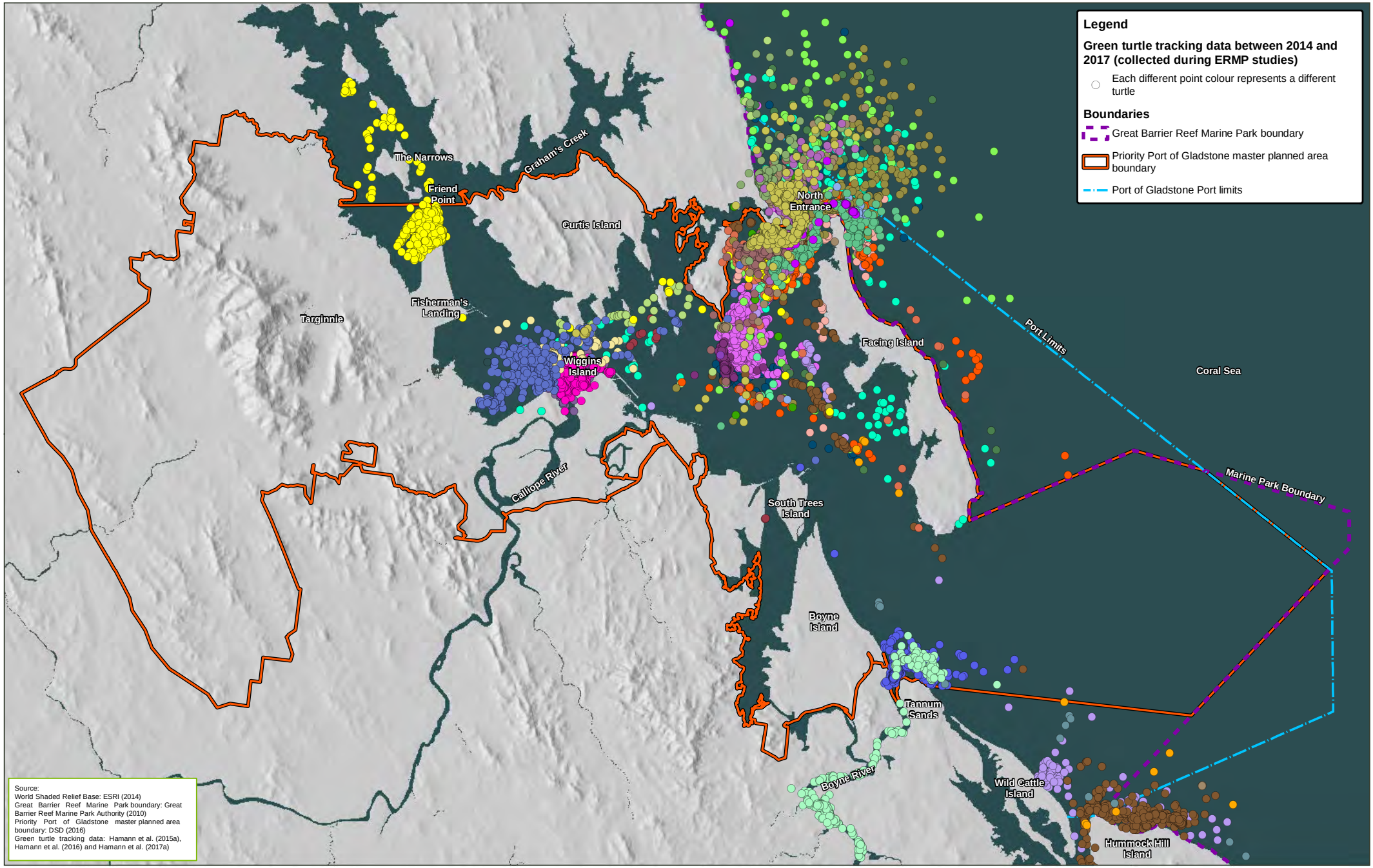
Figure B2: Coral



Coordinate system: GDA 1994 MGA Zone 56

Master plan for the priority Port of Gladstone

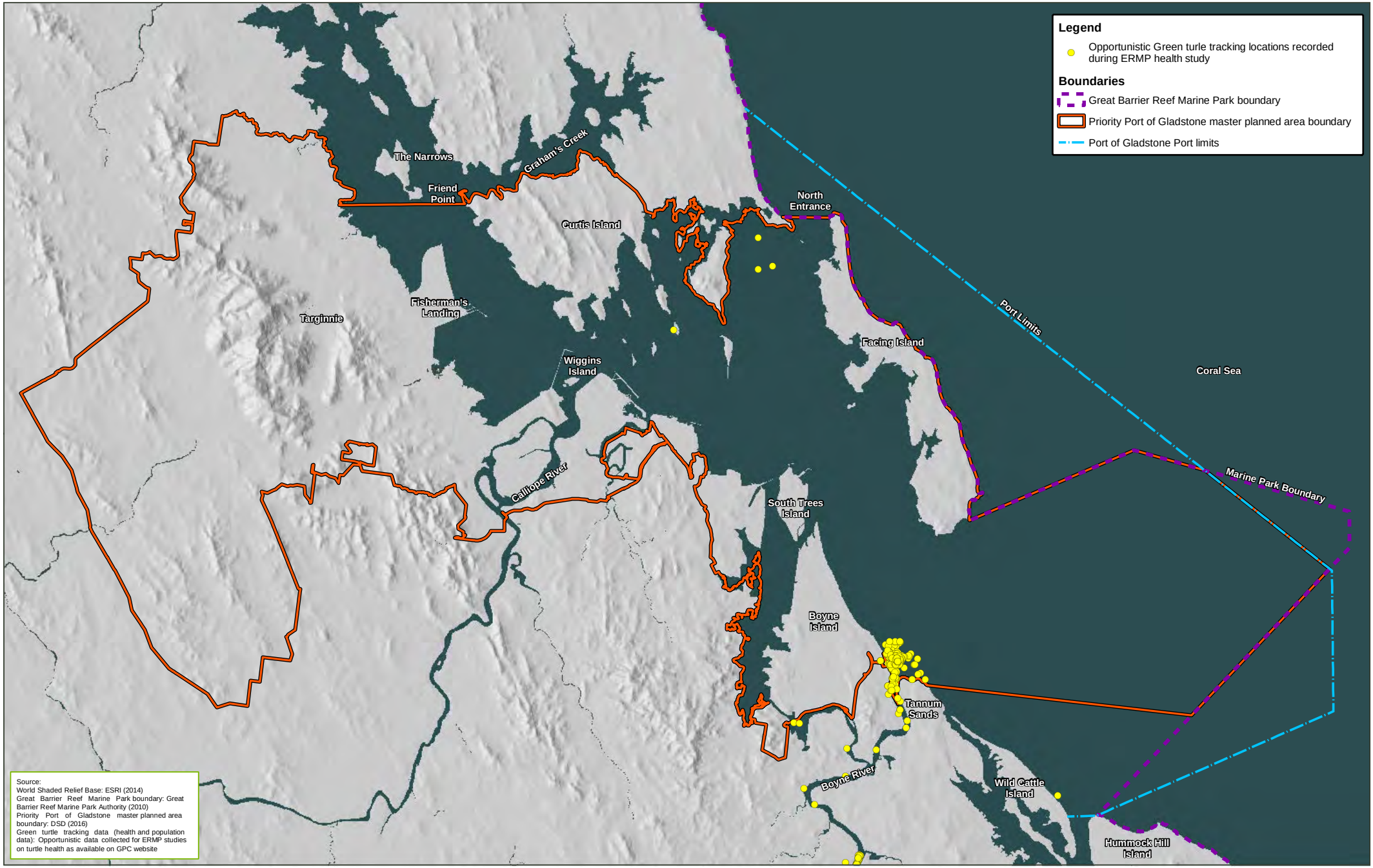
Figure B3a: Turtle nesting beaches



Coordinate system: GDA 1994 MGA Zone 56

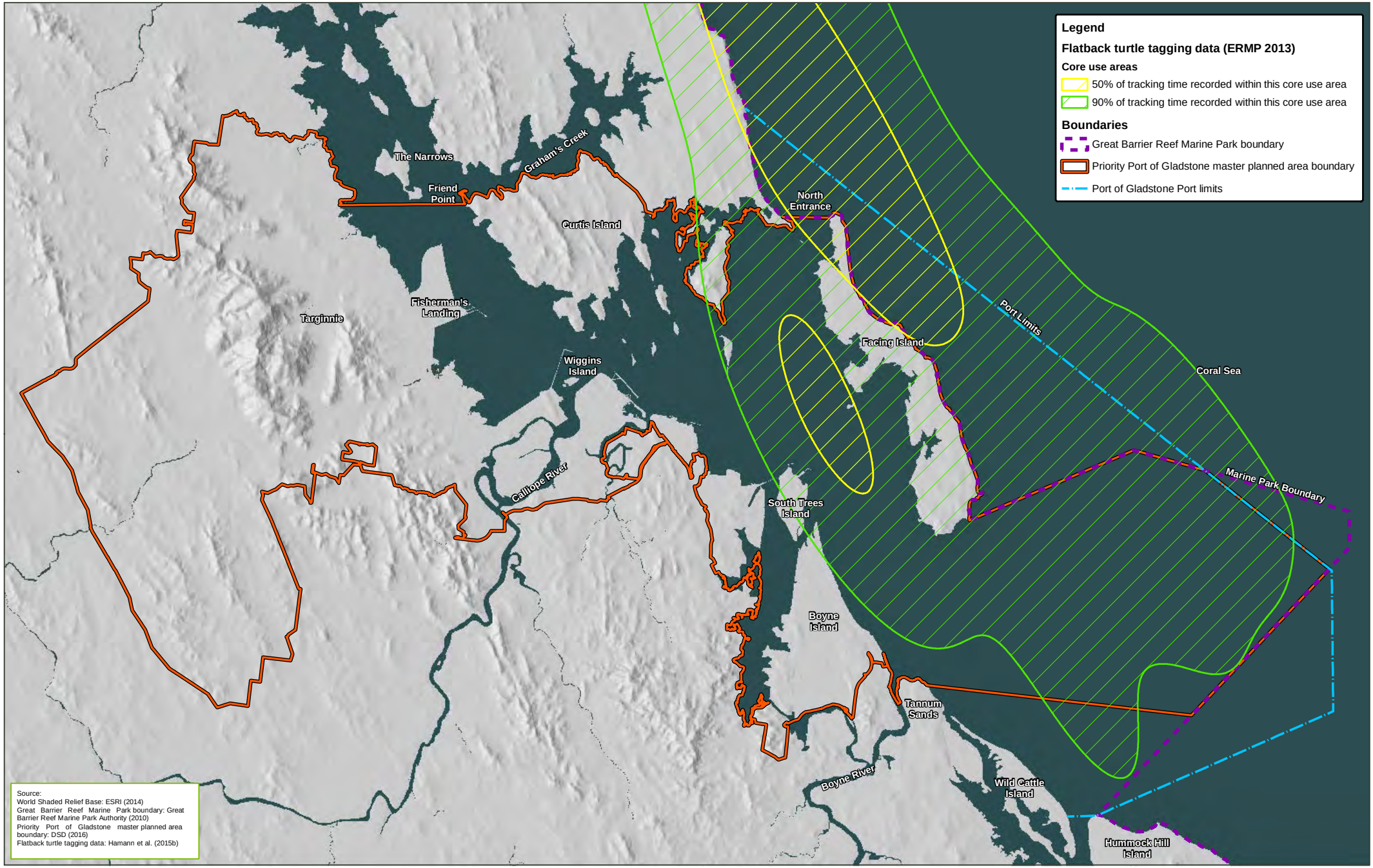
Master plan for the priority Port of Gladstone

Figure B3b: Green turtle tracking data during 2014, 2015, 2016 and 2017



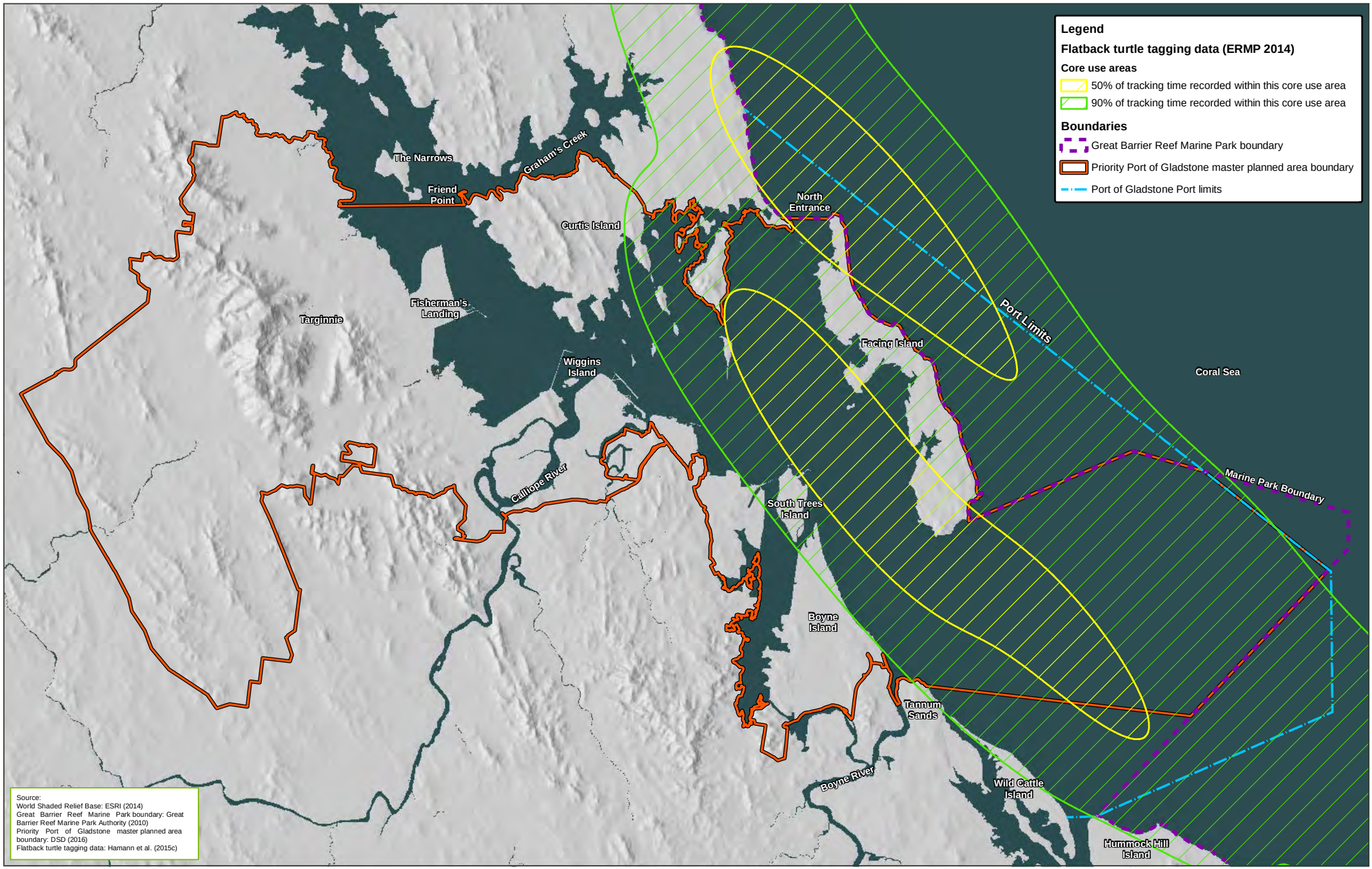
Coordinate system: GDA 1994 MGA Zone 56

Figure B3c: Green turtle tracking data (health and population data) during 2010 and 2017



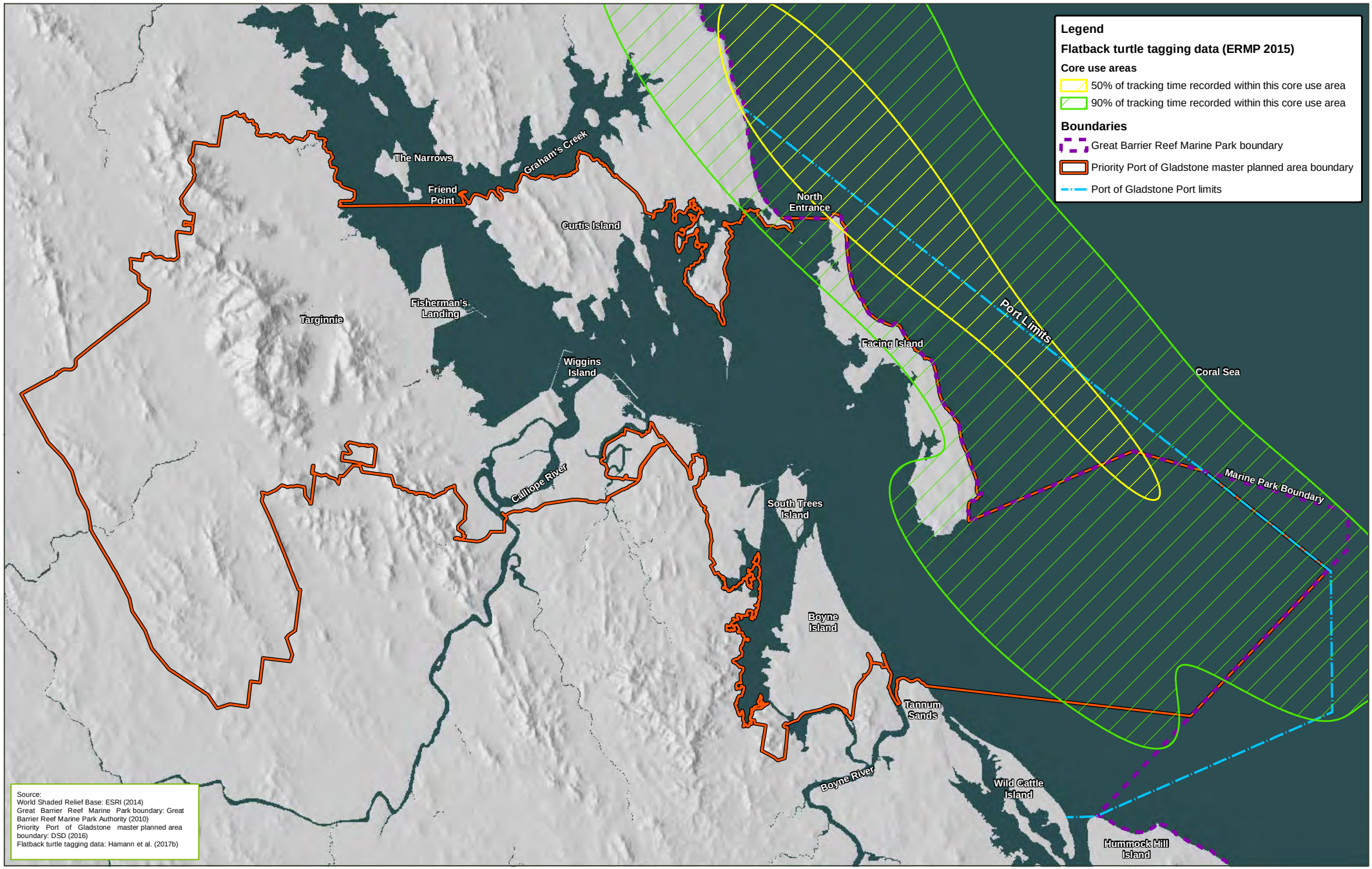
Coordinate system: GDA 1994 MGA Zone 56

Figure B3d: Core use areas of Flatback turtles tracked during internesting period in 2013



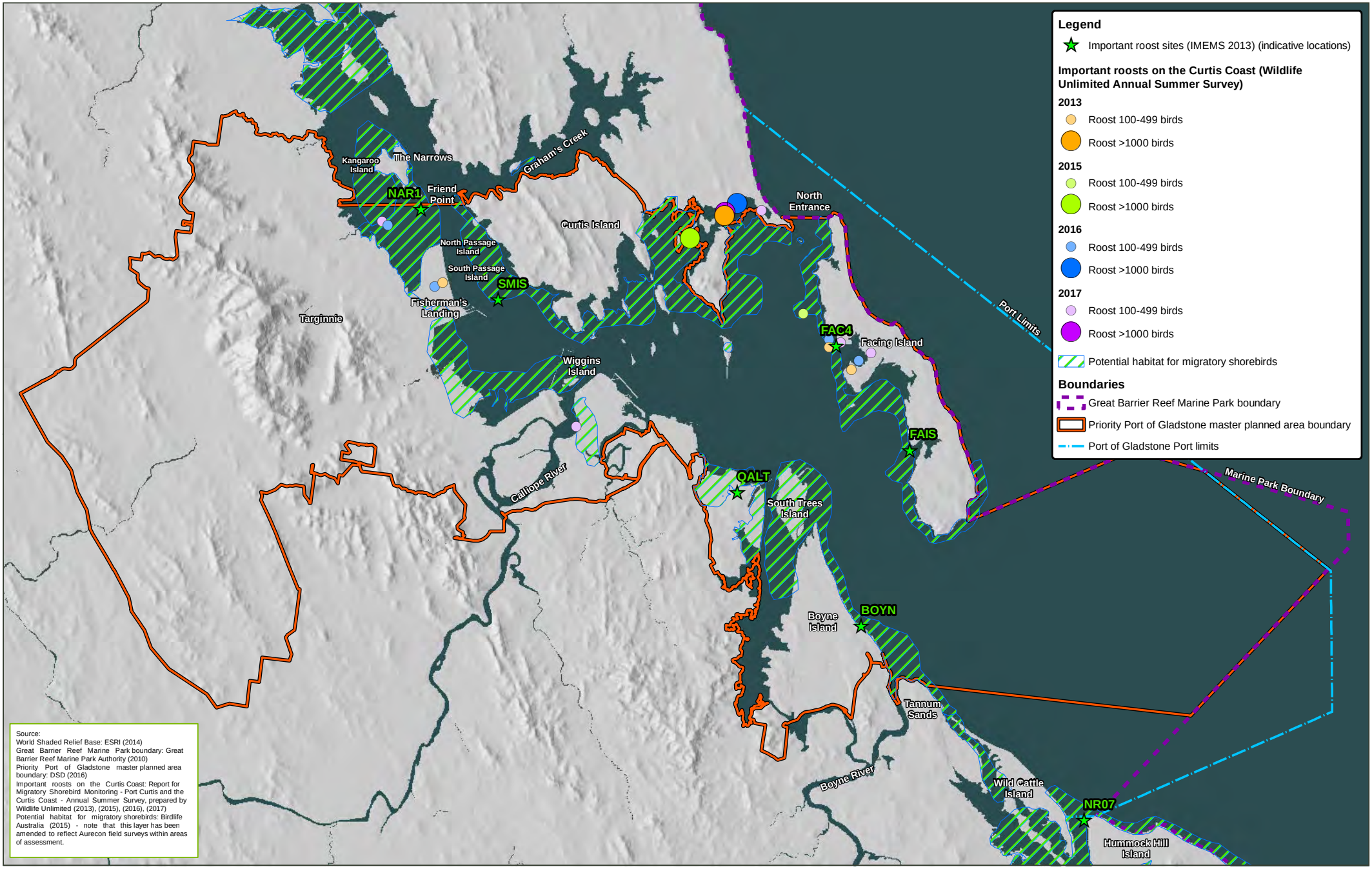
Coordinate system: GDA 1994 MGA Zone 56

Figure B3e: Core use areas of Flatback turtles tracked during internesting period in 2014



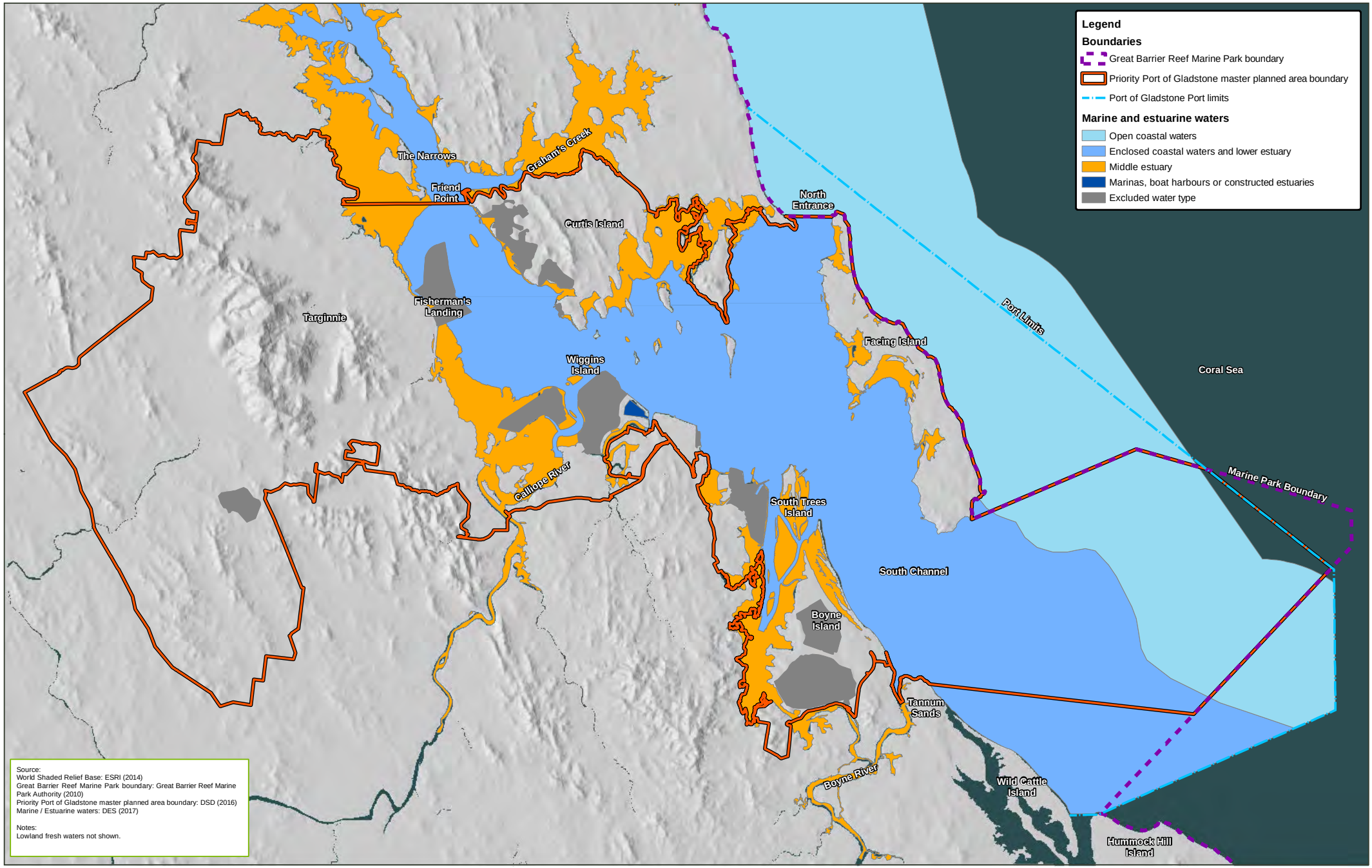
Coordinate system: GDA 1994 MGA Zone 56

Figure B3f: Core use areas of Flatback turtles tracked during internesting period in 2015



Coordinate system: GDA 1994 MGA Zone 56

Figure B4: Migratory shorebird habitat



Coordinate system: GDA 1994 MGA Zone 56

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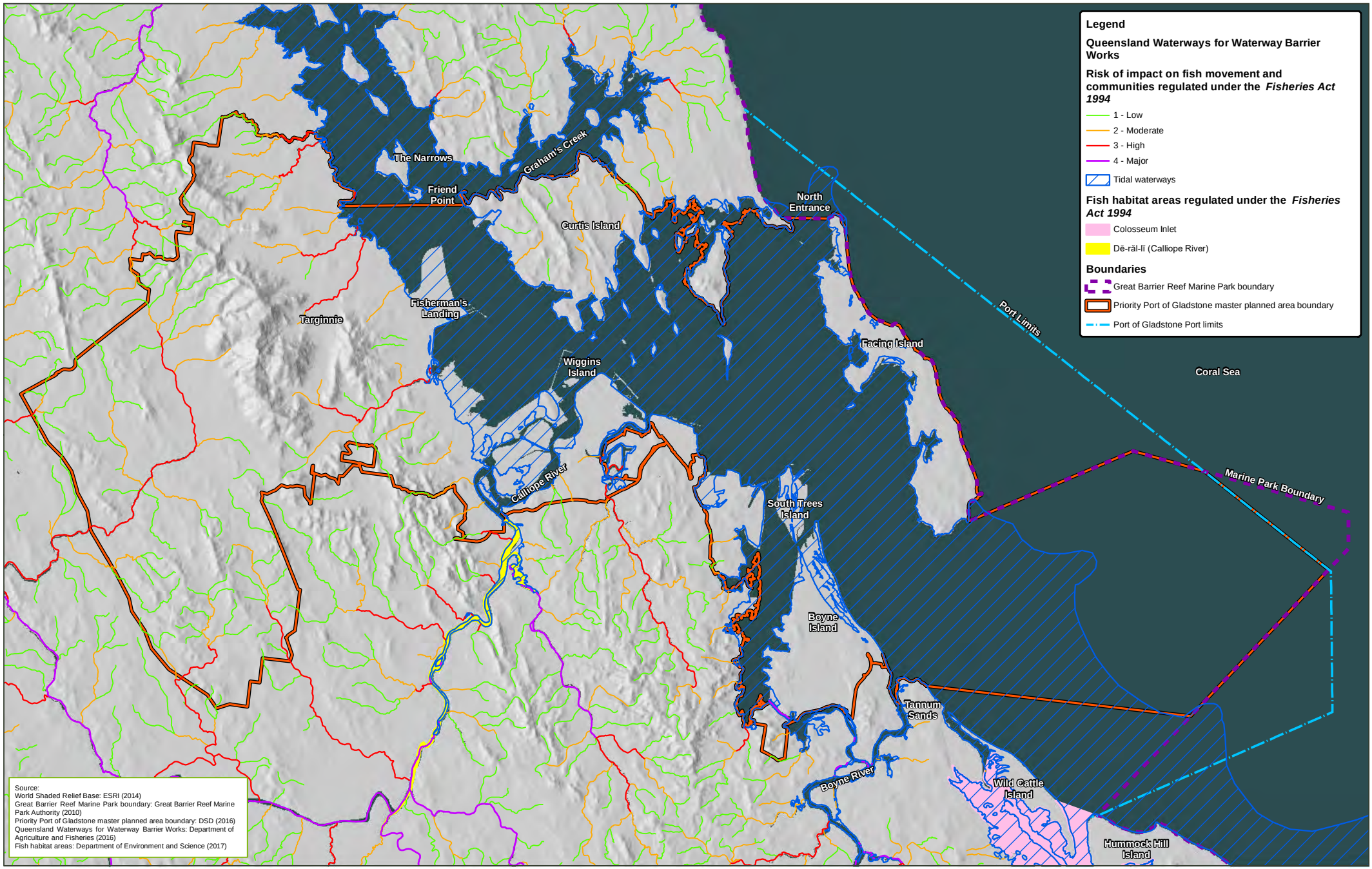
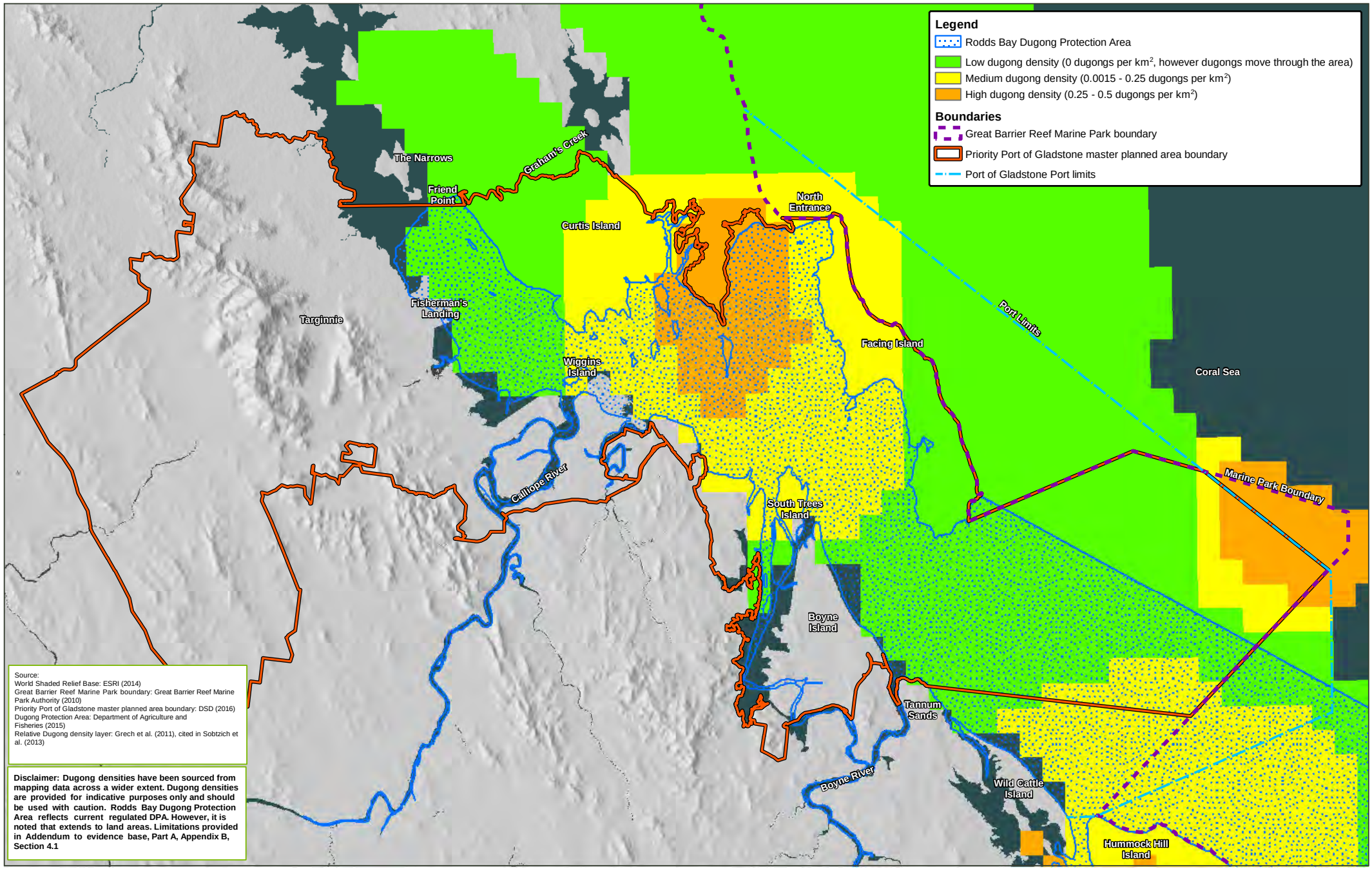
Figure B5: Marine and estuarine water types



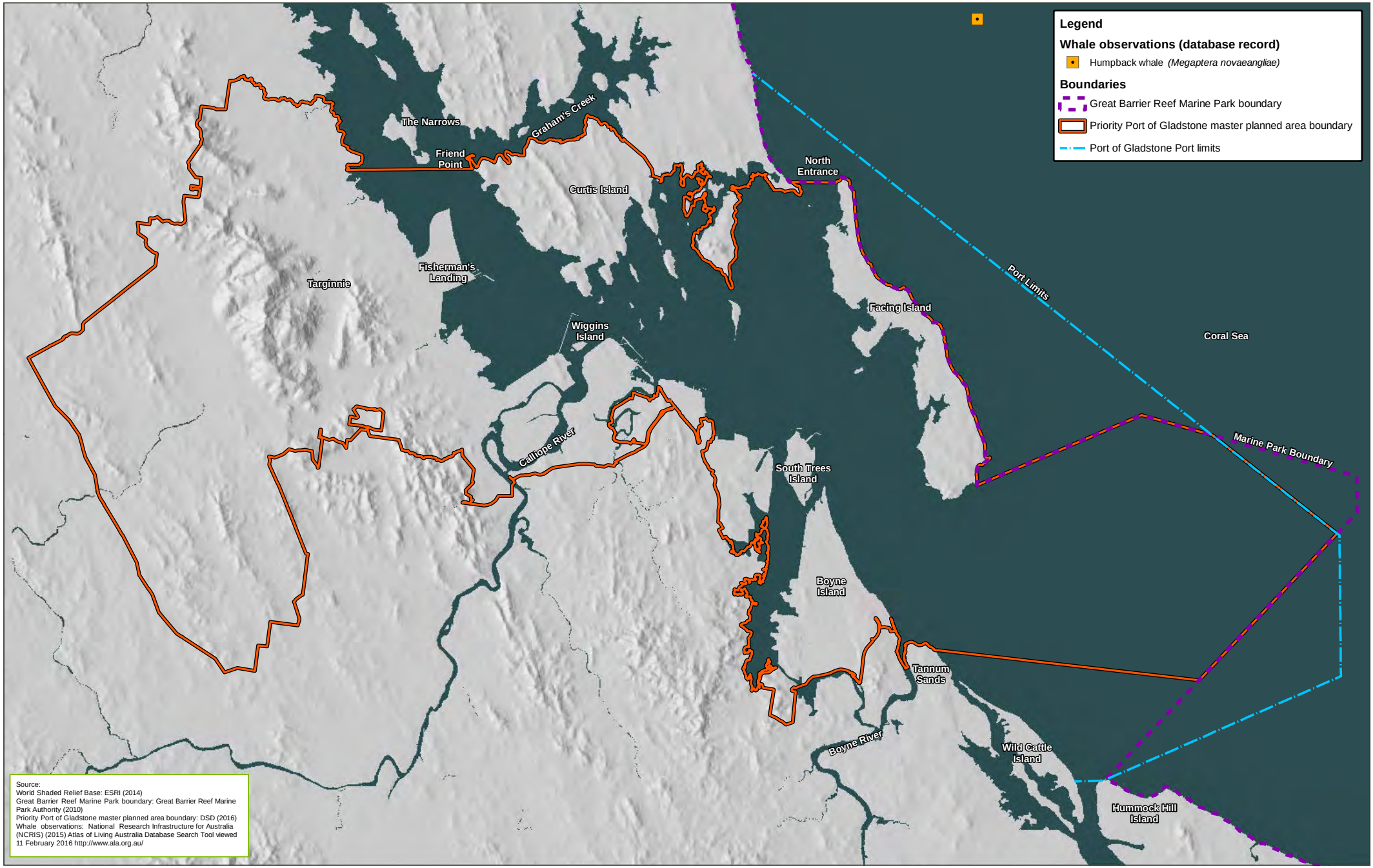
Coordinate system: GDA 1994 MGA Zone 56

Figure B6: Fish habitat areas and waterways providing for fish passage



Coordinate system: GDA 1994 MGA Zone 56

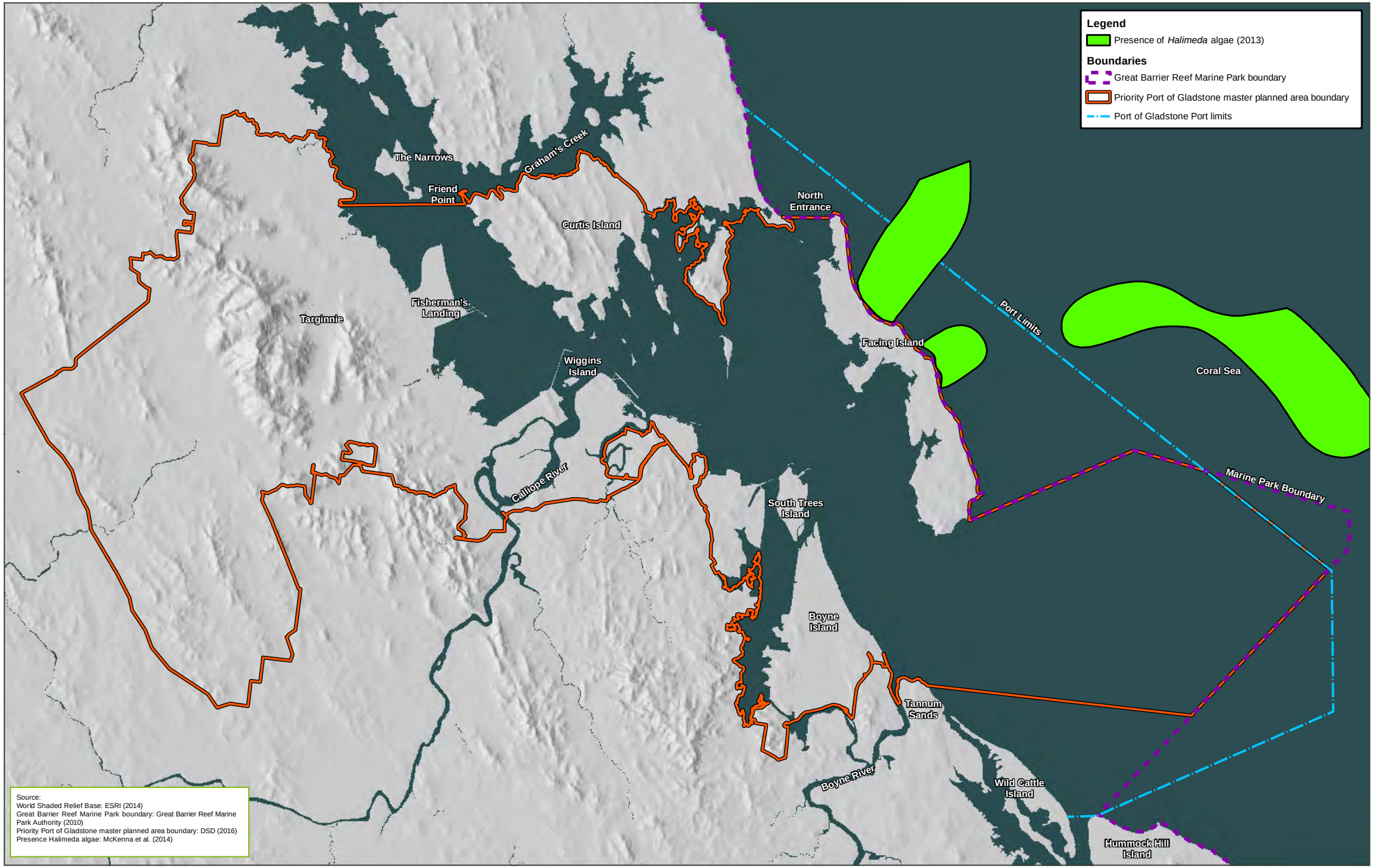
Figure B7: Rodds Bay Dugong Protection Area and relative Dugong density based on aerial surveys (1986 to 2005)



0 2,500 5,000 Meters

Coordinate system: GDA 1994 MGA Zone 56

Figure B8: Migrating whales



Coordinate system: GDA 1994 MGA Zone 56

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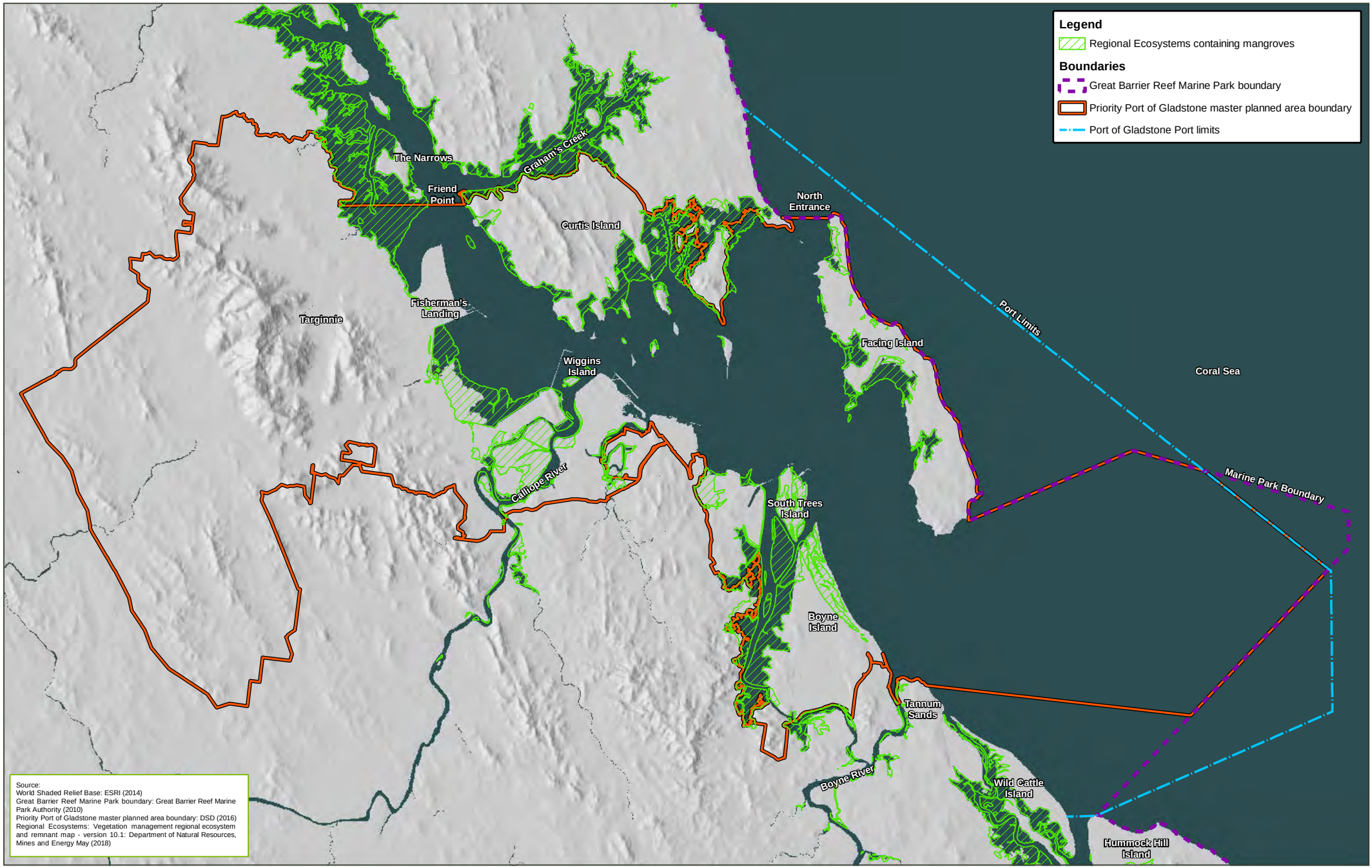
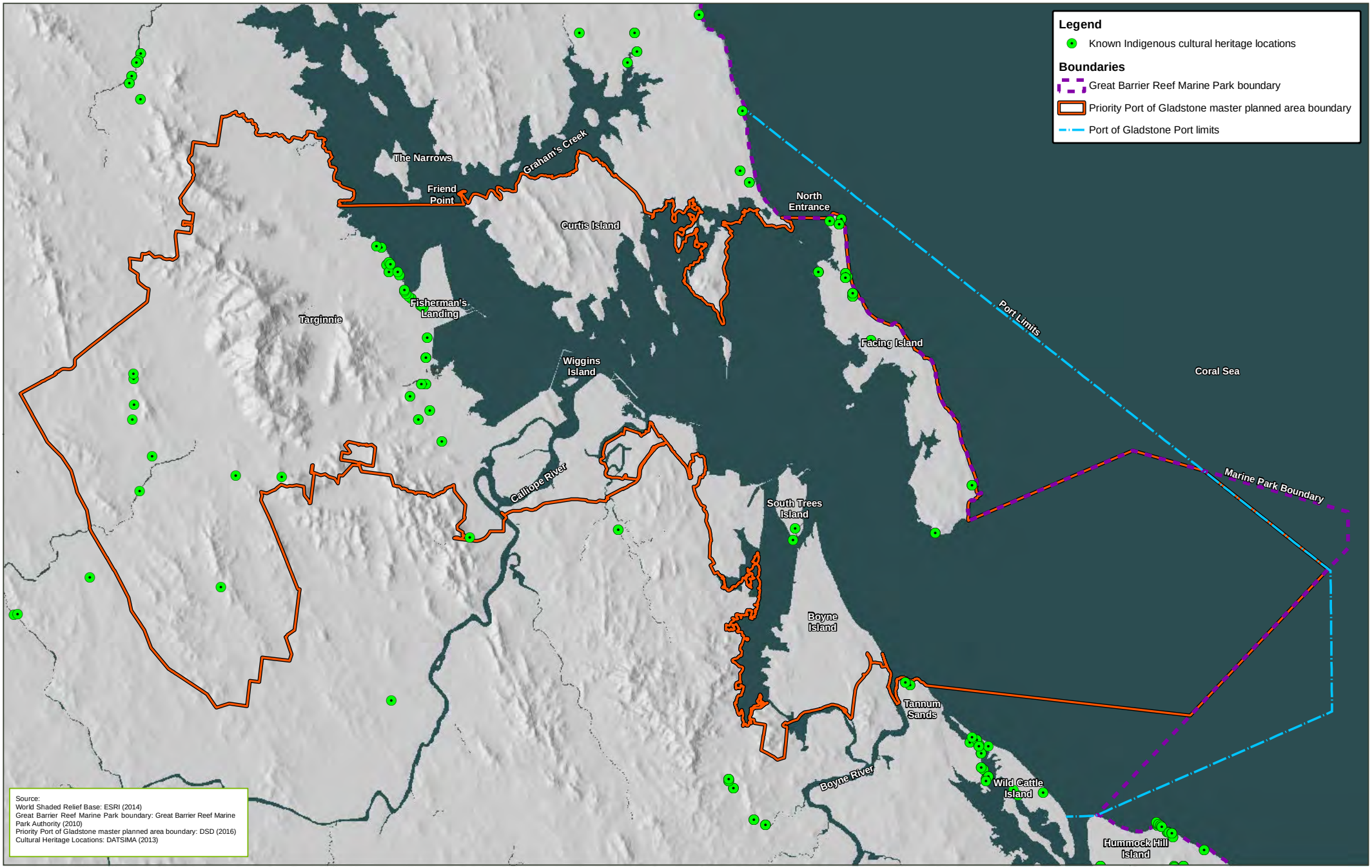
Figure B9: Presence of *Halimeda* algae



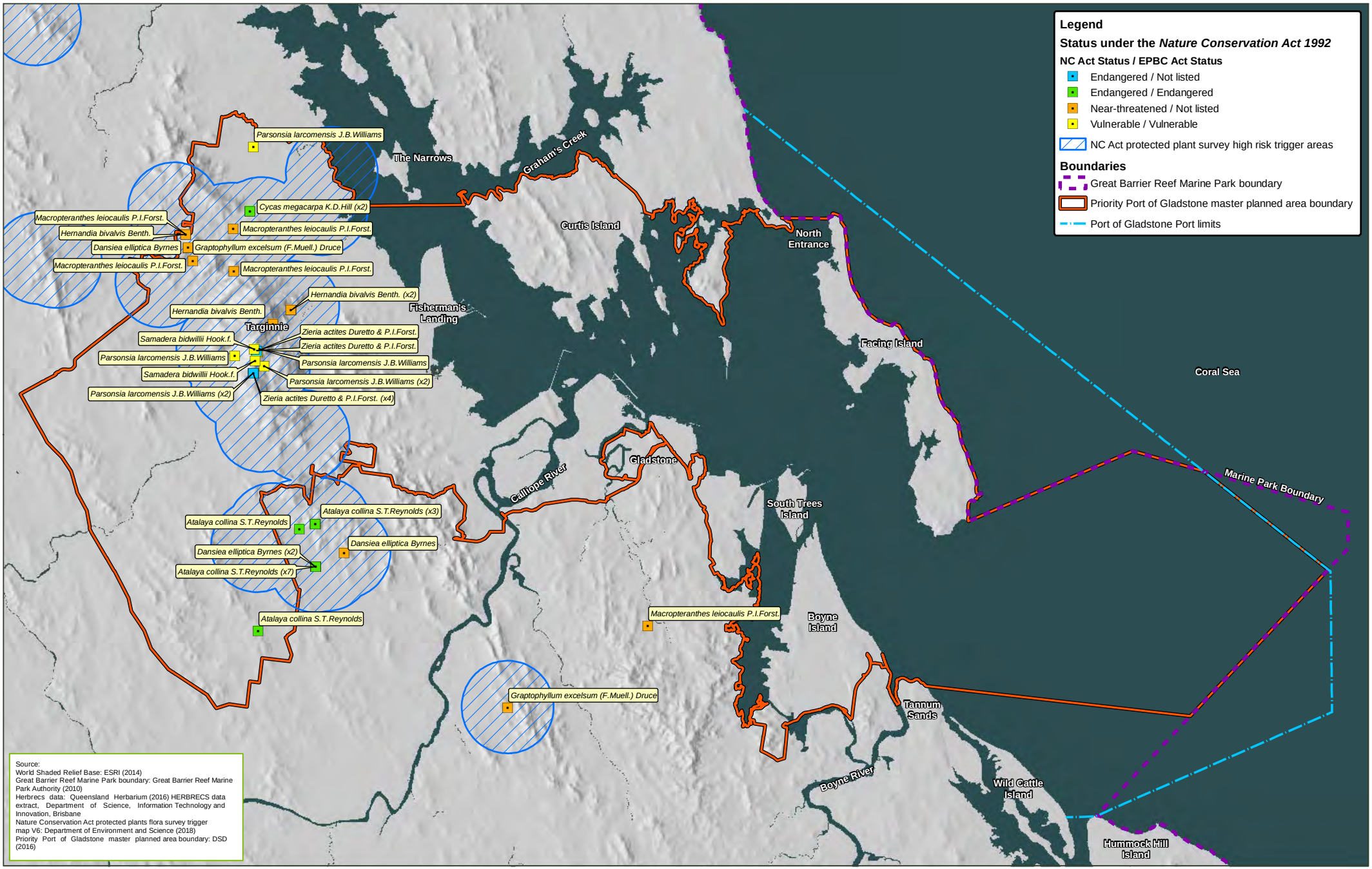
Coordinate system: GDA 1994 MGA Zone 56

Figure B10: Regional Ecosystems containing mangrove communities



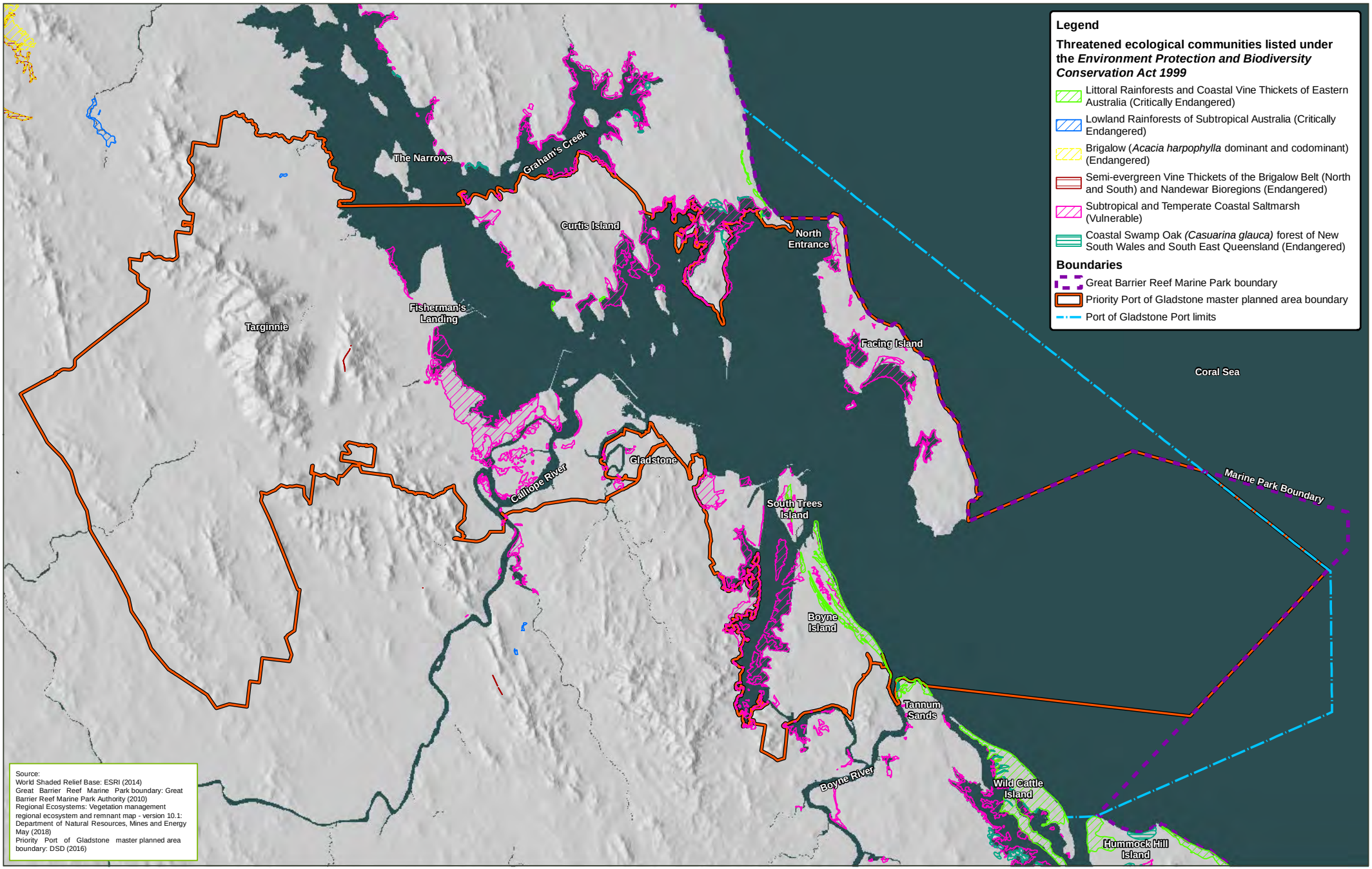
Coordinate system: GDA 1994 MGA Zone 56

Figure B11: Known Indigenous cultural heritage sites regulated under the *Aboriginal Cultural Heritage Act 2003*



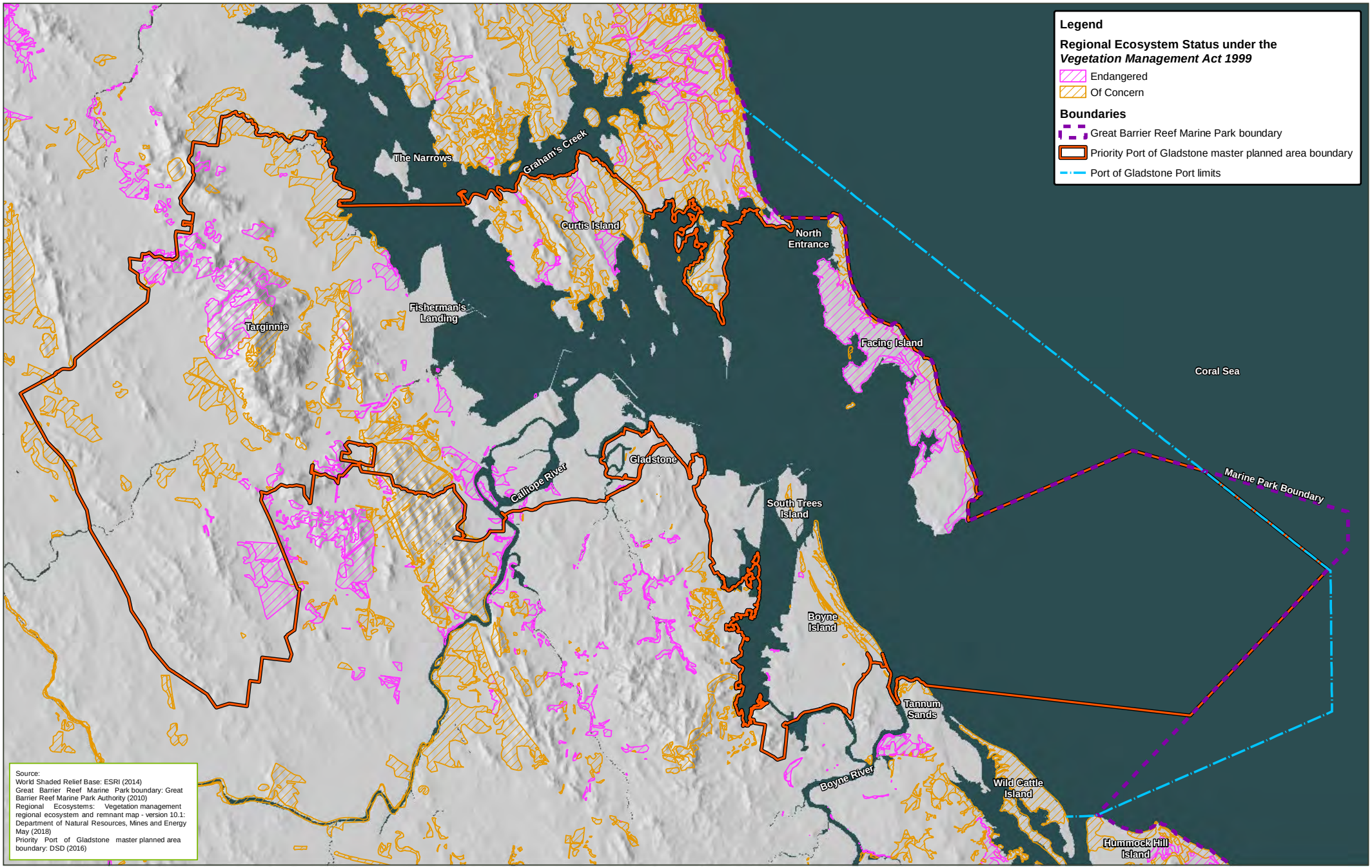
Coordinate system: GDA 1994 MGA Zone 56

Figure B12: *Nature Conservation Act 1992* listed threatened flora species records from Herbrecs database and protected plant survey 'high risk' trigger areas



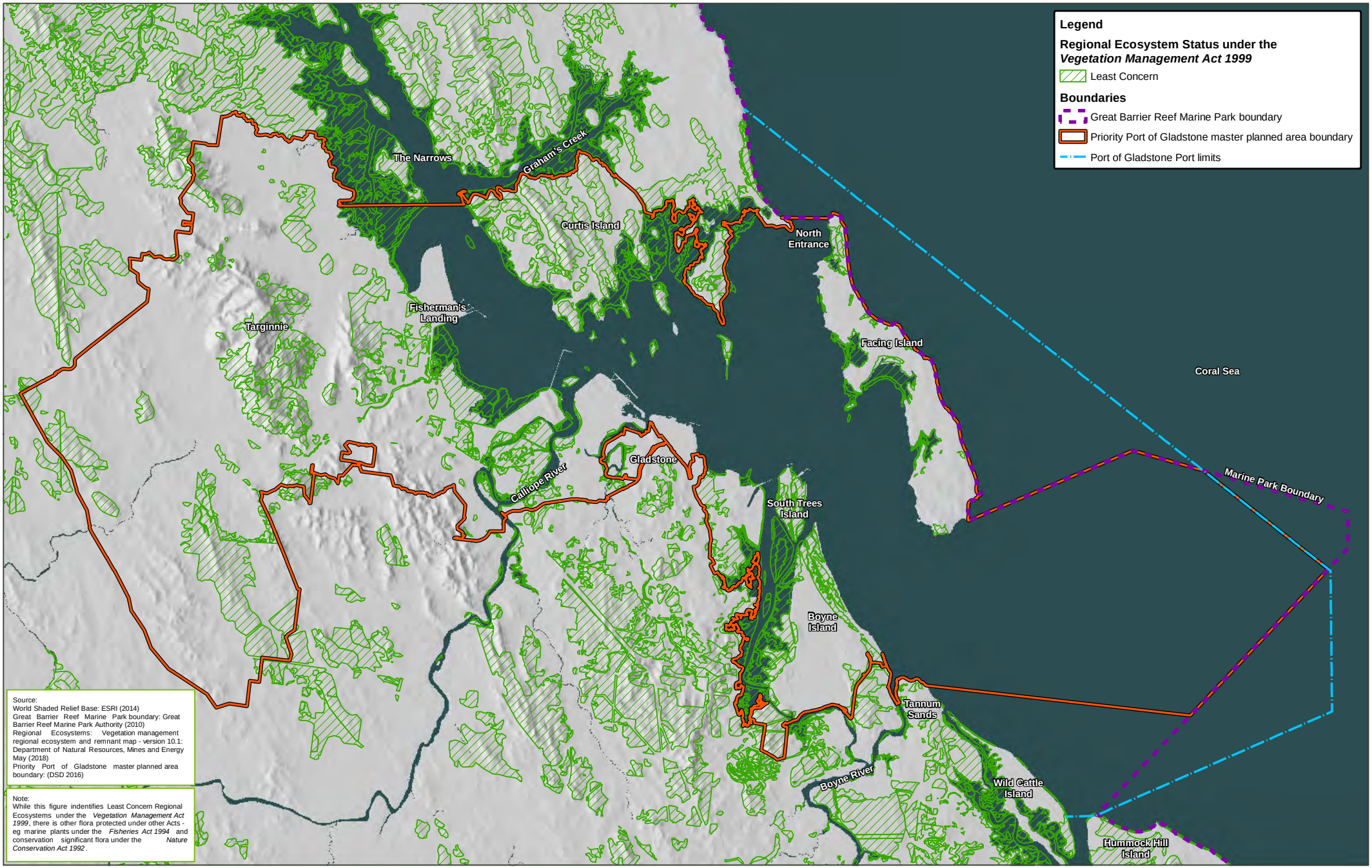
Coordinate system: GDA 1994 MGA Zone 56

Figure B13: Threatened ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999*



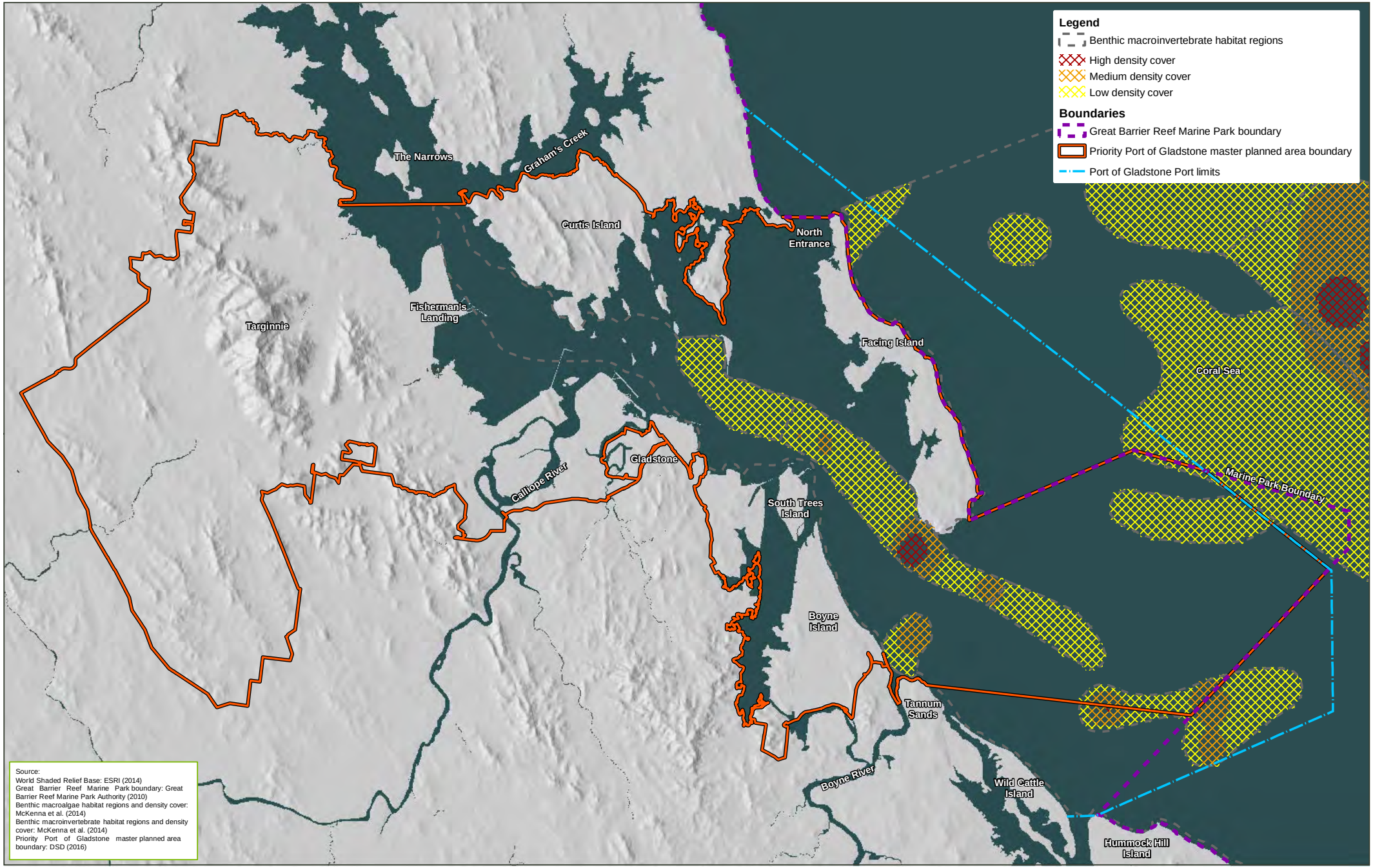
Coordinate system: GDA 1994 MGA Zone 56

Figure B14: Endangered and Of concern Regional Ecosystems as listed under the *Vegetation Management Act 1999*



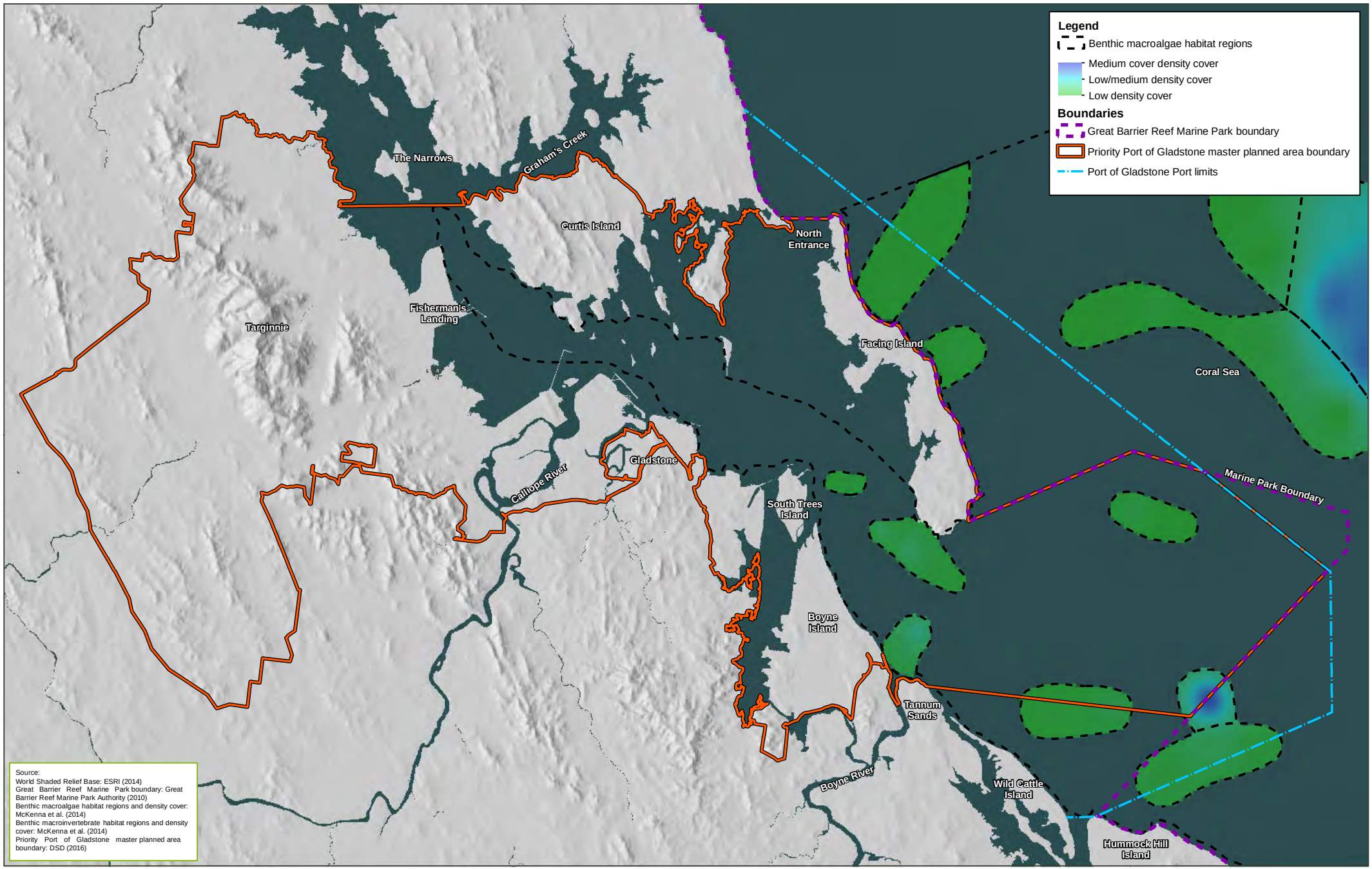
Coordinate system: GDA 1994 MGA Zone 56

Figure B15: Least concern Regional Ecosystems as listed under the *Vegetation Management Act 1999*



Coordinate system: GDA 1994 MGA Zone 56

Figure B16a: Benthic macroinvertebrate distribution and density cover



Coordinate system: GDA 1994 MGA Zone 56

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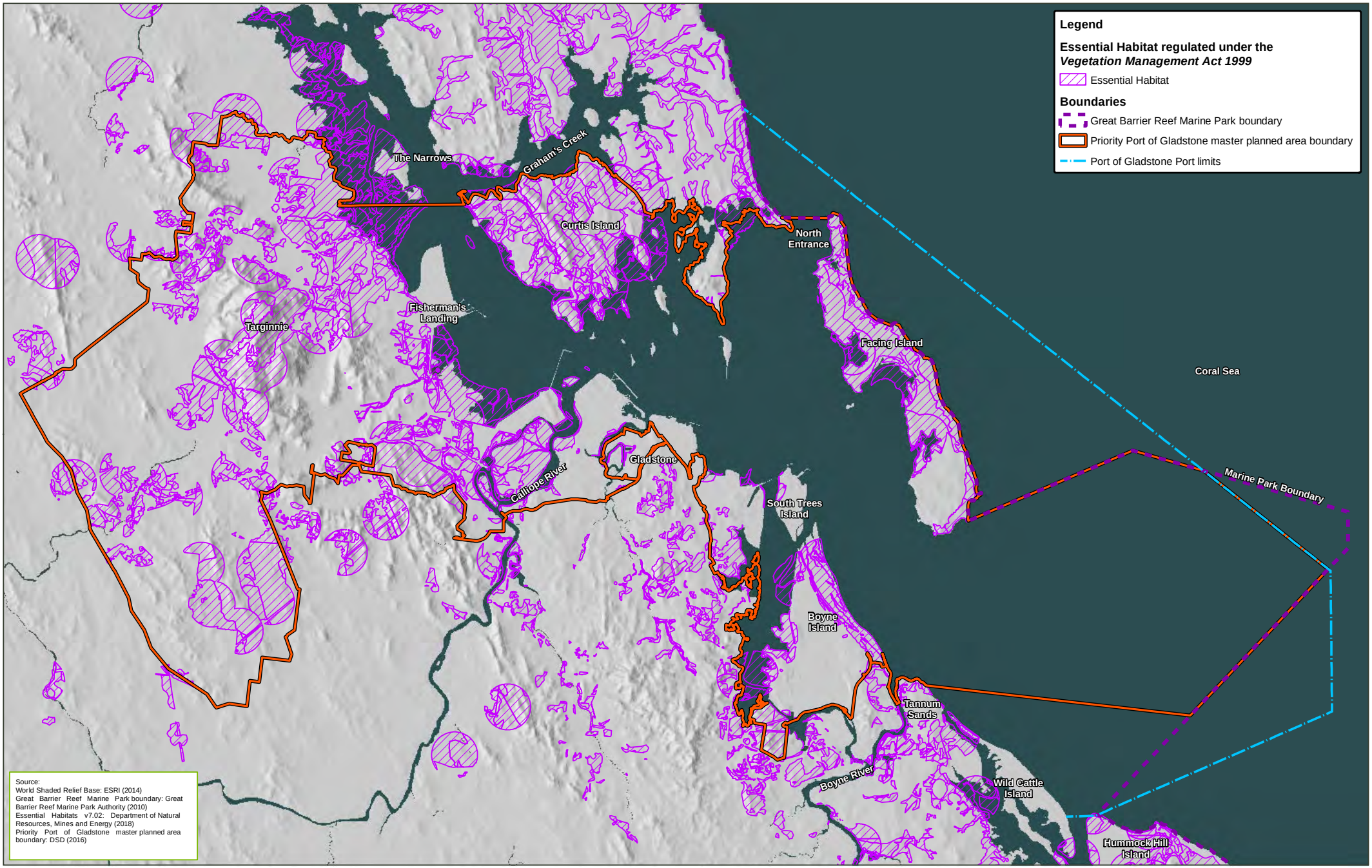
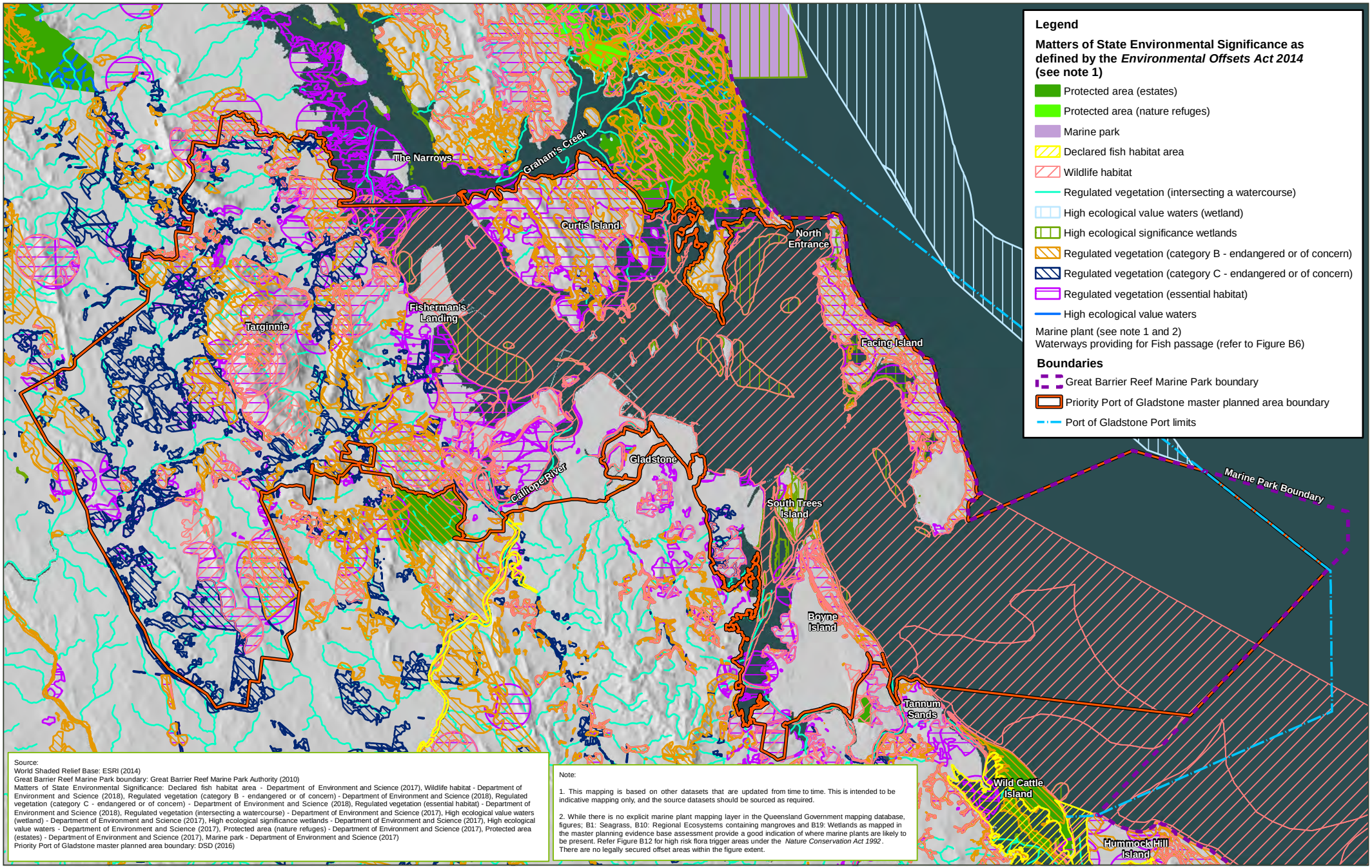
Figure B16b: Benthic macroalgae distribution and density cover



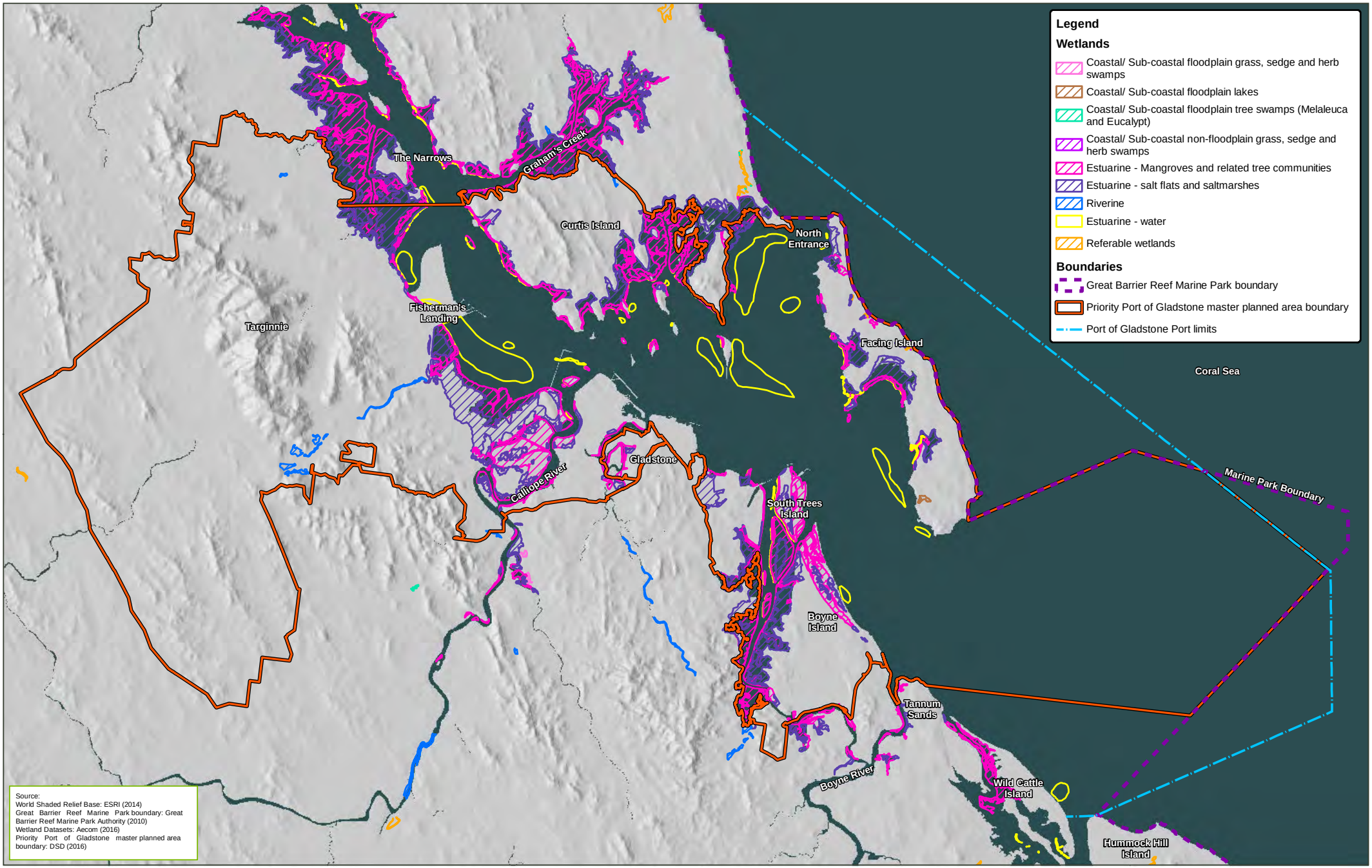
Coordinate system: GDA 1994 MGA Zone 56

Figure B17: Essential Habitat for threatened terrestrial flora and fauna species regulated under the *Vegetation Management Act 1999*



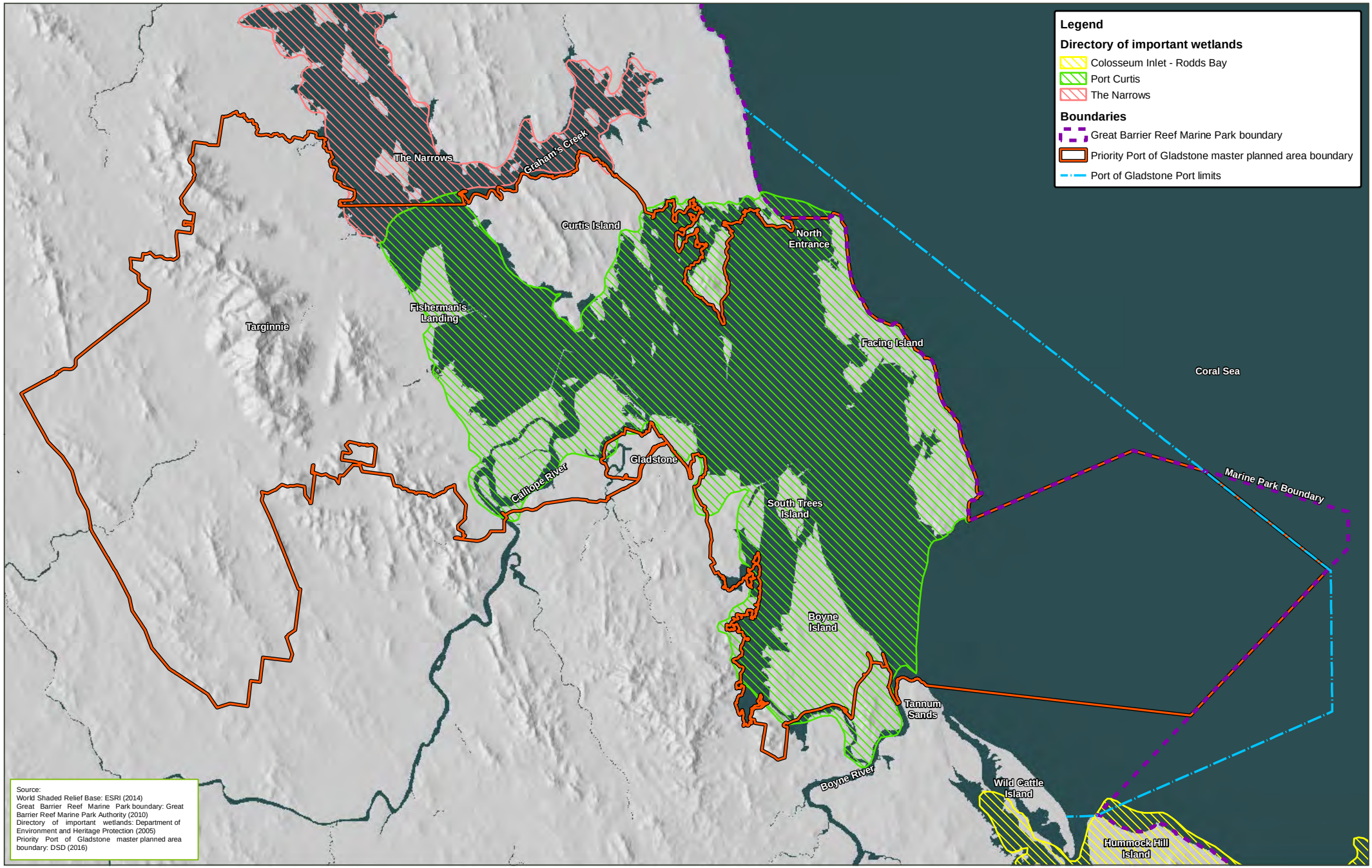
Coordinate system: GDA 1994 MGA Zone 56

Figure B18: Matters of state environmental significance defined under the *Environmental Offsets Act 2014*



Coordinate system: GDA 1994 MGA Zone 56

Figure B19: Wetlands as mapped in the Master Planning Evidence Base Assessment



Coordinate system: GDA 1994 MGA Zone 56

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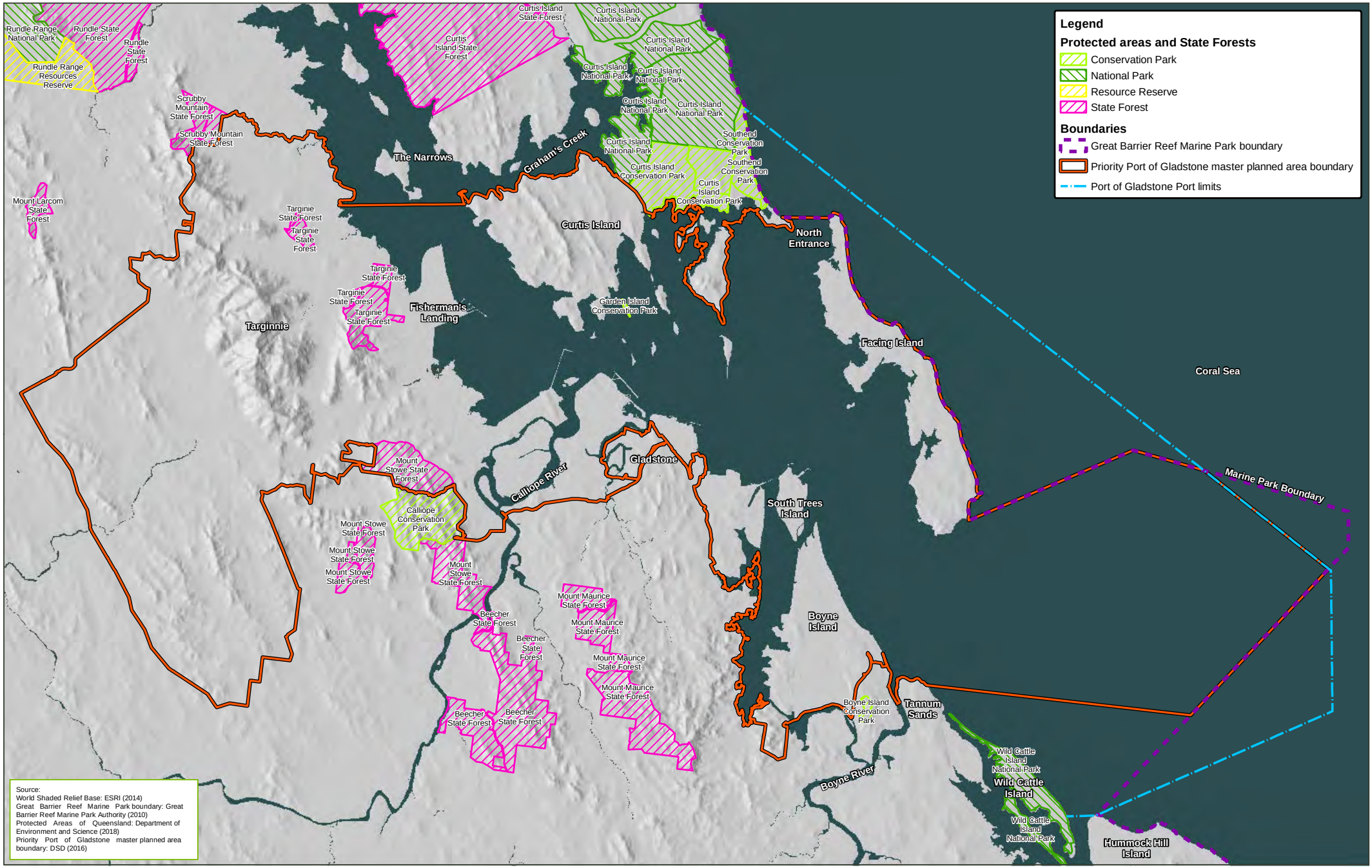
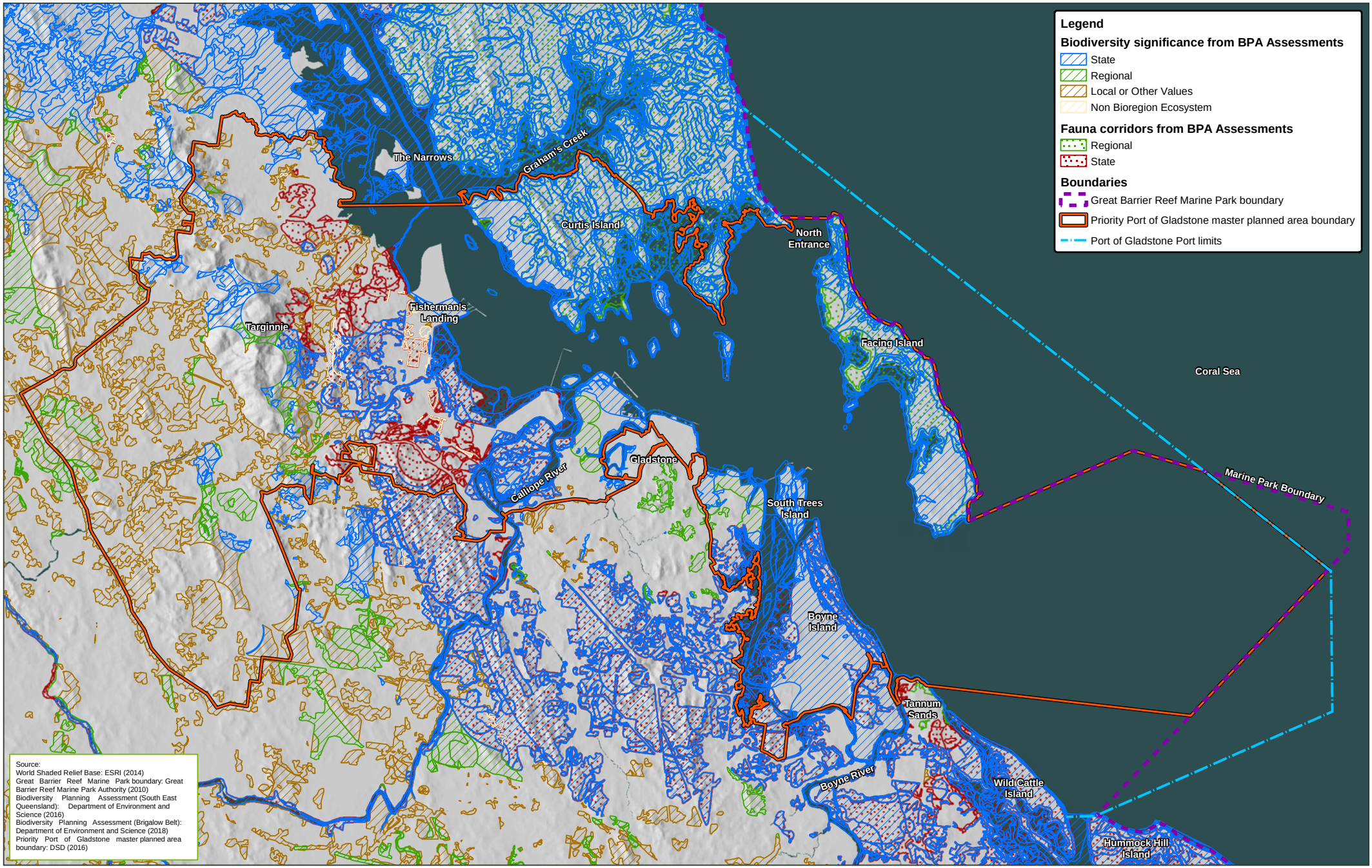
Figure B20: Directory of important wetlands



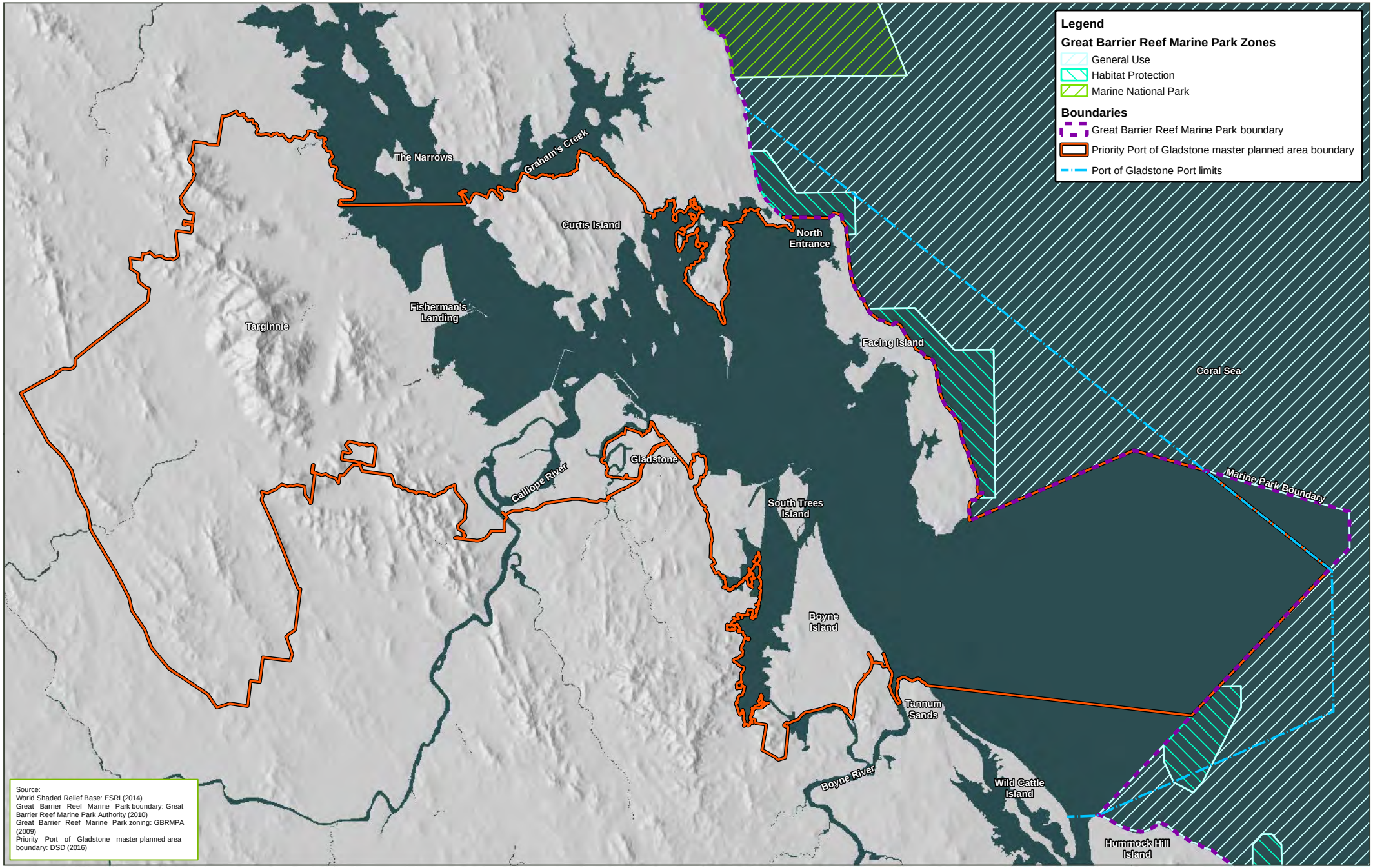
Coordinate system: GDA 1994 MGA Zone 56

Figure B21: Protected areas regulated under the *Nature Conservation Act 1992* and State Forests regulated under the *Forestry Act 1959*



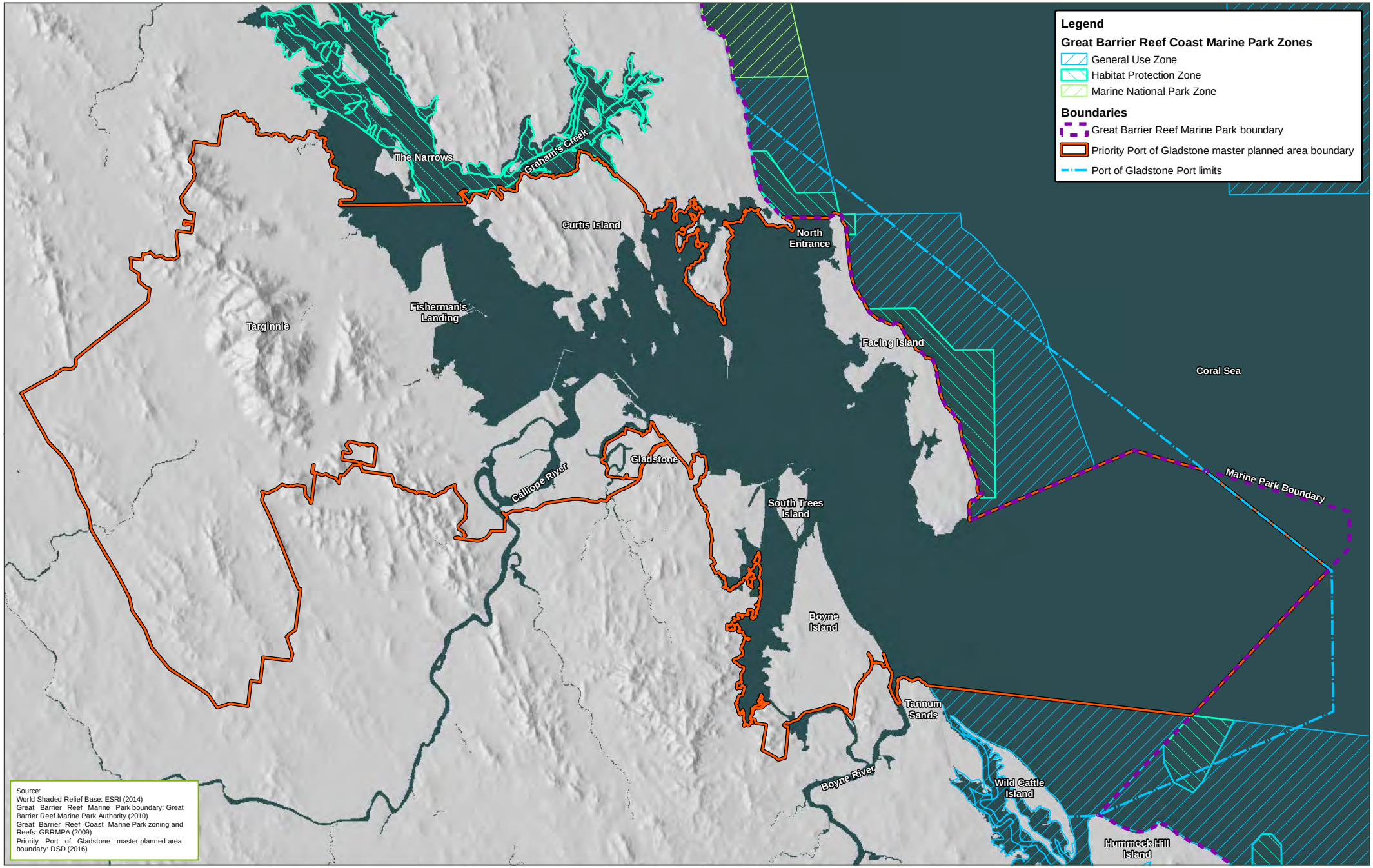
Coordinate system: GDA 1994 MGA Zone 56

Figure B22: Biodiversity Planning Assessment areas mapped using the Biodiversity Assessment and Mapping Methodology



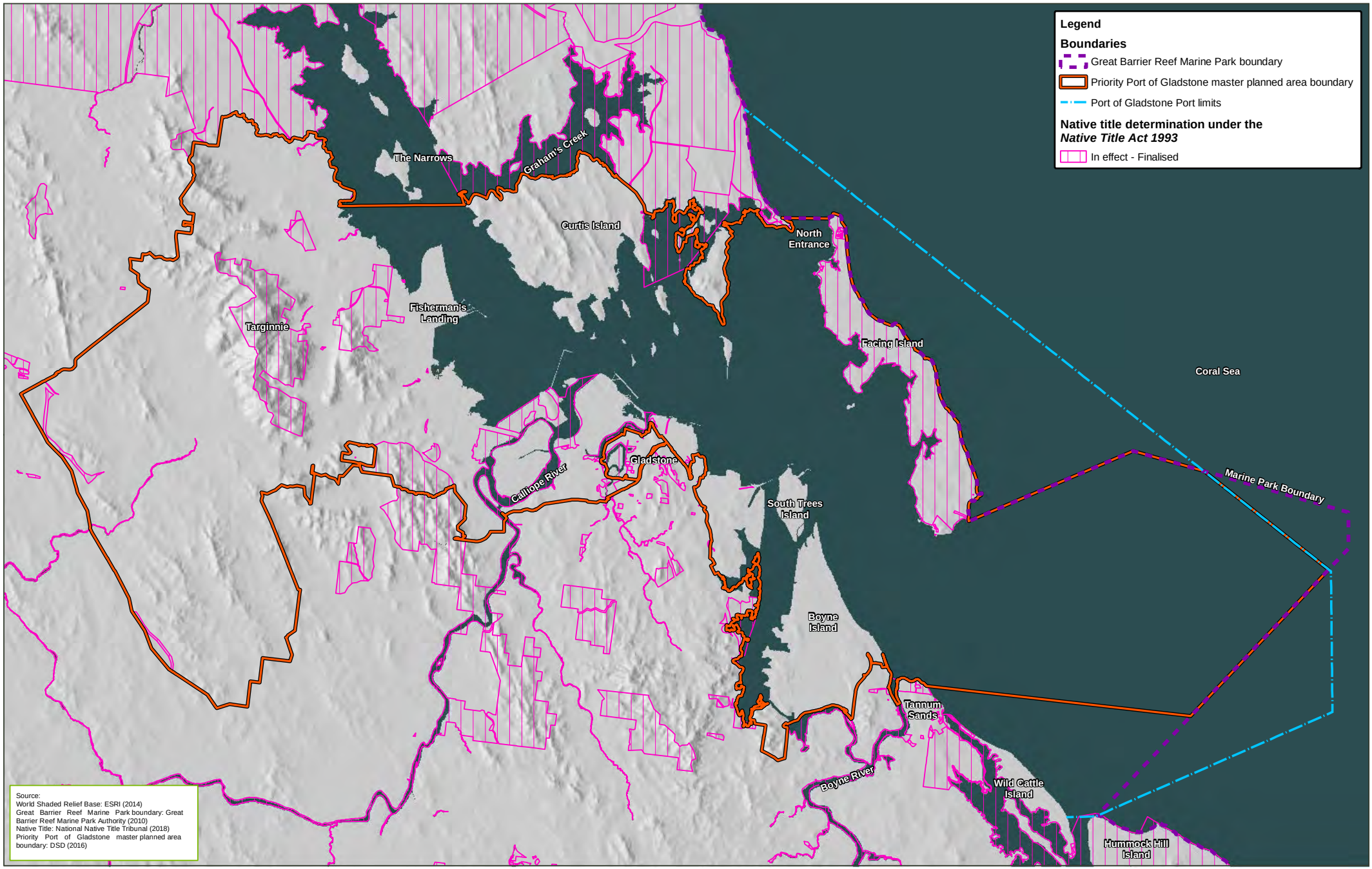
Coordinate system: GDA 1994 MGA Zone 56

Figure B23: Great Barrier Reef Marine Park Zones (Commonwealth)



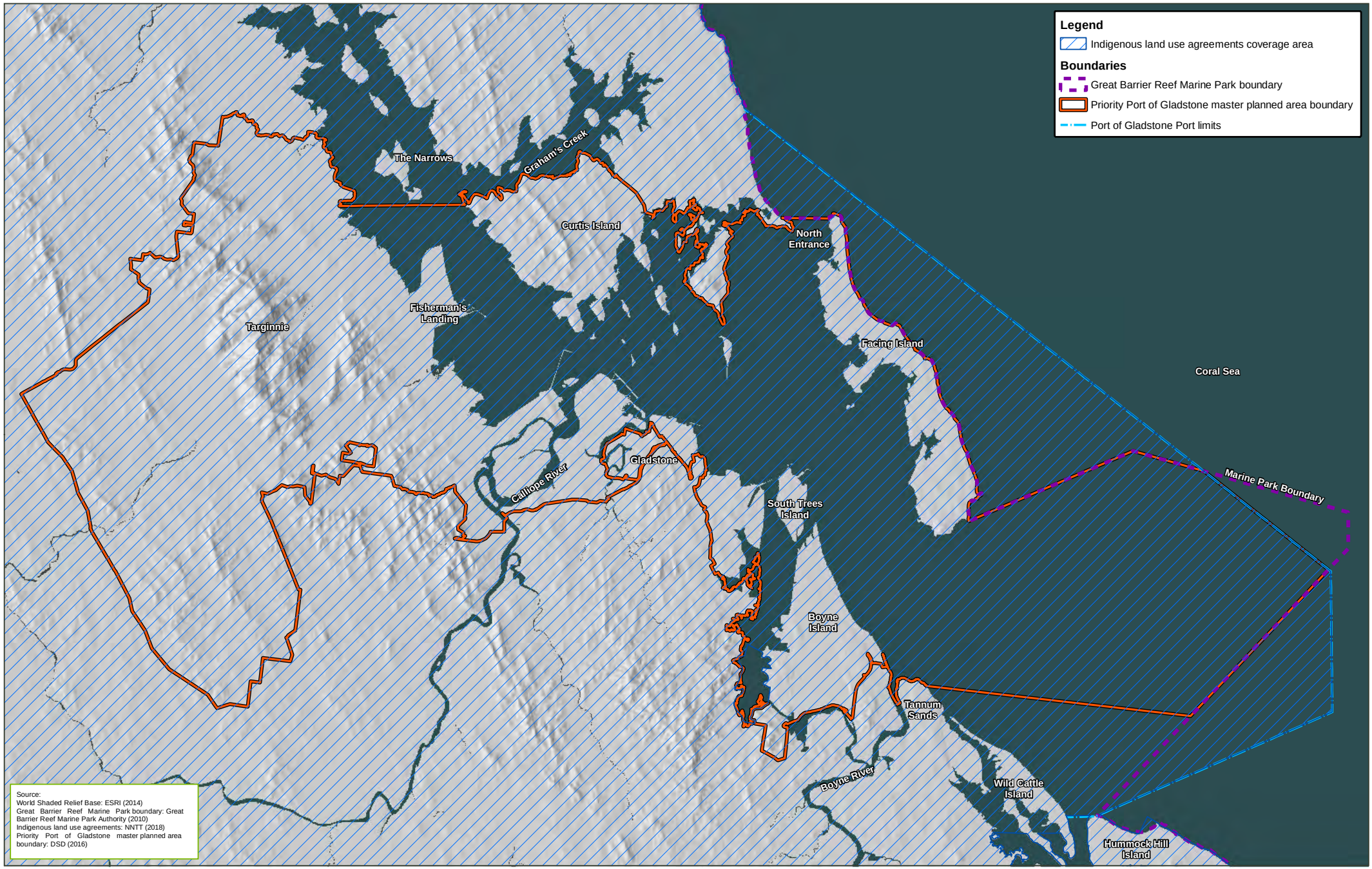
Coordinate system: GDA 1994 MGA Zone 56

Figure B24: Great Barrier Reef Coast Marine Park Zones (State)



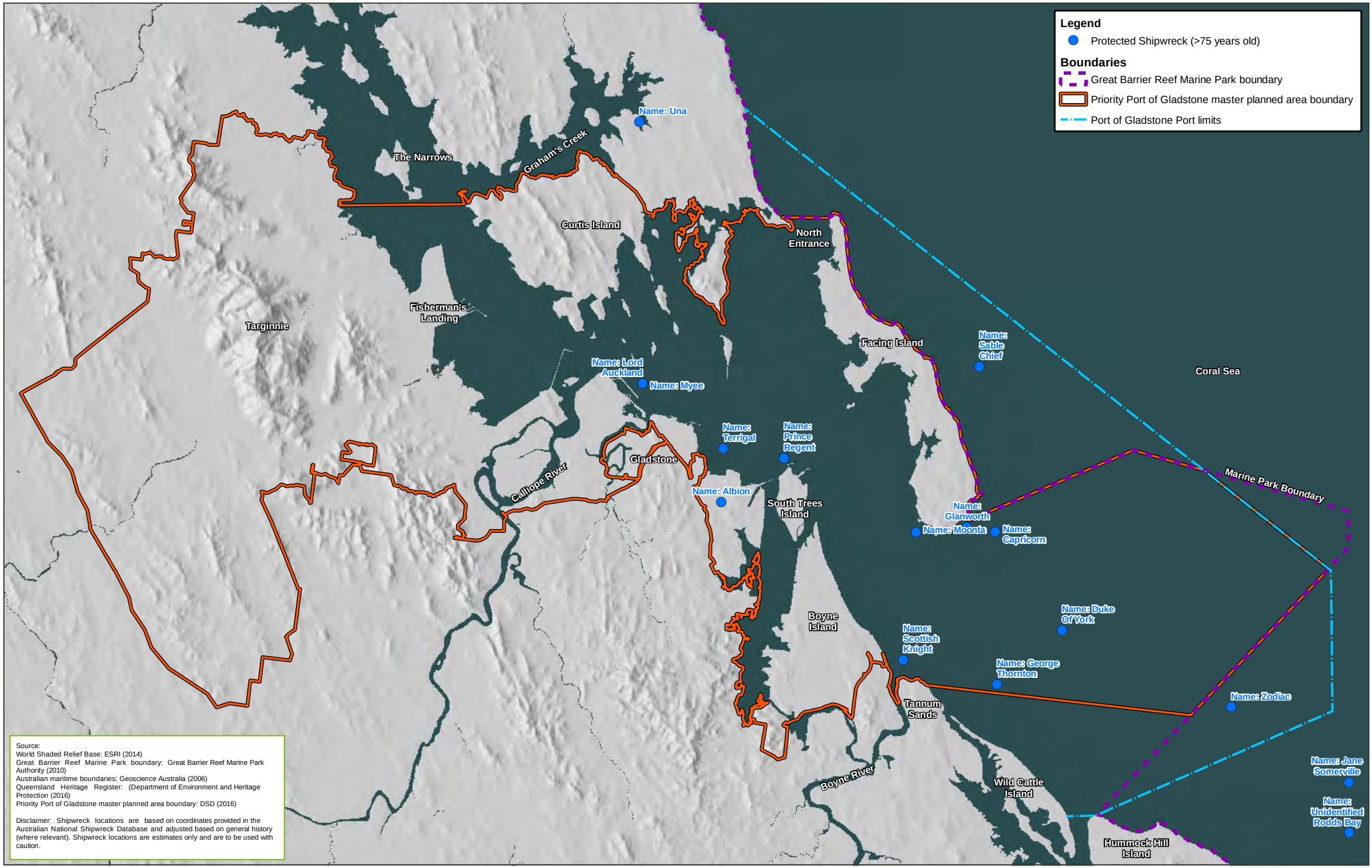
Coordinate system: GDA 1994 MGA Zone 56

Figure B25: Native title determination under the *Native Title Act 1993*



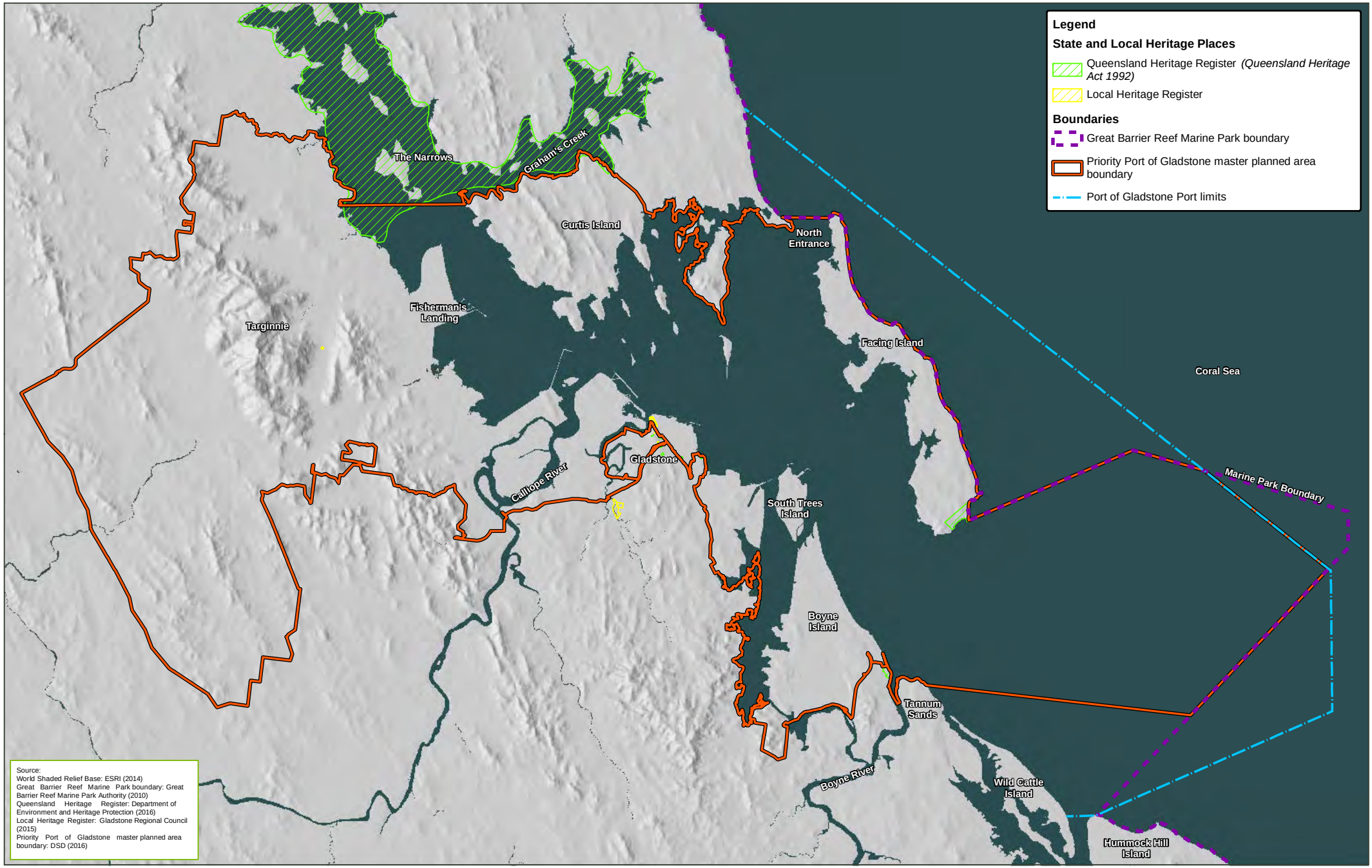
Coordinate system: GDA 1994 MGA Zone 56

Figure B26: Coverage of Indigenous land use agreements notified or registered under the *Native Title Act 1993*



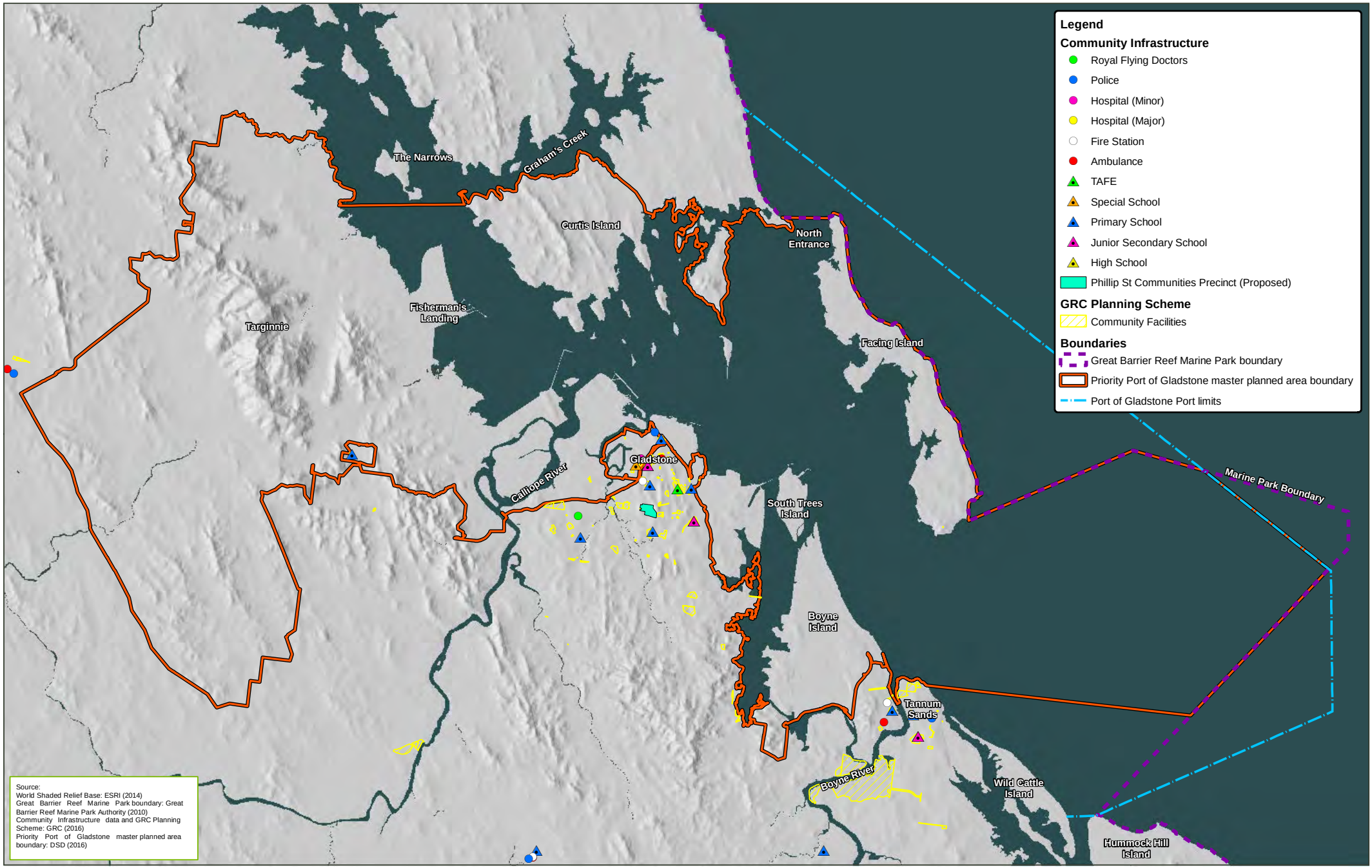
Coordinate system: GDA 1994 MGA Zone 56

Figure B27: World, Commonwealth and National Heritage Places protected under the *Environment Protection and Biodiversity Conservation Act 1999* and Shipwrecks protected under the *Historic Shipwrecks Act 1976*



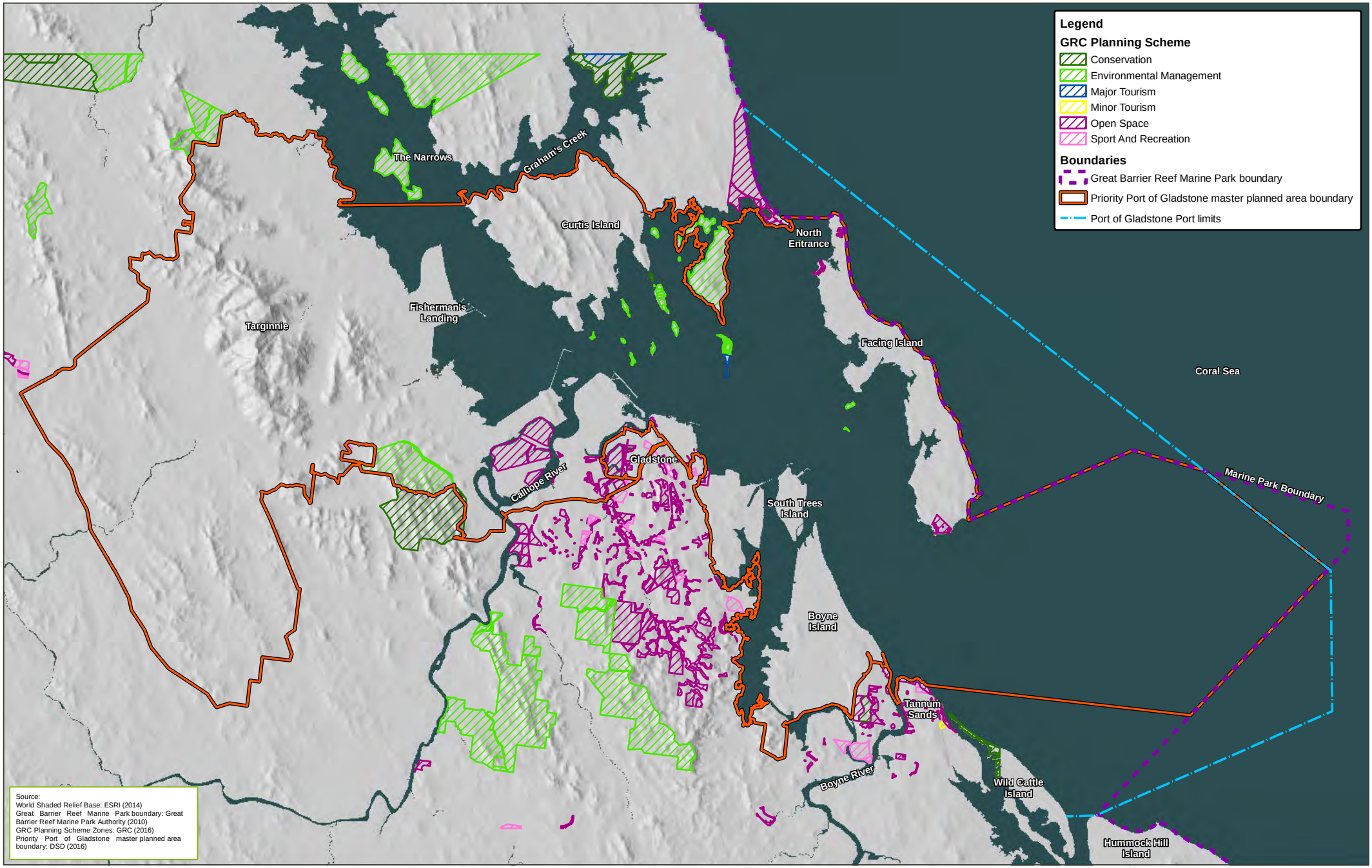
Coordinate system: GDA 1994 MGA Zone 56

Figure B28: State heritage places protected under the *Queensland Heritage Act 1992* and local heritage places



Coordinate system: GDA 1994 MGA Zone 56

Figure B29: Social and community infrastructure identified in the Gladstone Regional Council Planning Scheme



Coordinate system: GDA 1994 MGA Zone 56

Figure B30: Recreational opportunities and natural amenity as identified by the Gladstone Regional Council Planning Scheme

Appendix C
Local attributes that contribute to the OUV of the GBRWHA

The contribution classifications for each OUV local attribute and associated environmental values have been determined as part of a comprehensive, evidence-based assessment. That assessment took account of factors including, but not limited to:

- the history, current function and land uses of the port
- regulatory context of port operations
- environmental, social and cultural heritage values represented within and surrounding the master planned area as well as more broadly across the GBRWHA
- other factors that could affect determination of the master planned area
- potential for future development.

Information used was the most up to date available at the time. Detailed findings are reported within the evidence base (Aurecon 2017) with key information extracted and presented herein to inform the local expression of values that contribute to the OUV of the GBRWHA. The classifications used for that assessment are generally defined as:

- **Minor contribution (Min)**: The attribute is present however it occurs in low abundance or singularly and is:
  - » not essential to the sustainability of the attribute (for example substantial breeding population)
  - » not recognised as a key feature of the GBRWHA
  - » not included in the retrospective statement of OUV
  - » not iconic, unique or a high quality example of the attribute.
- **Moderate contribution (Mod)**: The attribute occurs in moderate abundance or across a moderately large area but is not the prime occurrence or representation of the attribute within the GBRWHA. The attribute does however represent a feature for which the Great Barrier Reef was listed as World Heritage.
- **Significant contribution (Sig)**: The attribute represents locally important examples of the attribute relative to the nature of the attribute across the GBRWHA. Such an attribute may be specifically referred to within the retrospective statement of OUV for the GBRWHA or defined by other legislation, planning instrument or values assessment (for example in Great Barrier Reef Outlook Report). The occurrence of the attribute locally is a prime example of the features mentioned in the retrospective statement of OUV (Adaptive Strategies et al. 2017).

Table C1 summarises the locally expressed OUV attributes within the master planned area and surrounding areas, and their contribution classifications relative to the OUV of the GBRWHA. **Table C1** also includes a summary of the environmental values determined to be key contributors to the local expression of OUV (that is, key environmental values). Other environmental values are recognised as locally contributing to the overall OUV of the GBRWHA and are identified in the Addendum to evidence base (Aurecon 2017).

Table C1 – Local attributes of the OUV of the GBRWHA within and surrounding the master planned area

Category	Local attribute	Relevant OUV criteria and contribution classifications				Summary of the key environmental values
		vii	viii	ix	ix	
Coral reefs	Fringing reefs	Min	Min	Min	Min	Fringing coral reefs
	Inshore turbid reefs	-	Min	Min	Min	Inshore turbid coral reefs
	Coral species diversity and extent	Min	Min	Min	Min	Various coral species
Marine water quality	Marine water quality	-	-	Mod	Mod	Marine water quality
Fish	Fish species and diversity	Min	-	Min	Min	Colosseum Inlet Fish Habitat Area Dē-răl-lĭ Fish Habitat Area (Calliope River) Coral reefs, seagrass meadows, mangrove communities, hard and soft benthic substrates, beach habitats, estuaries, creeks and rivers
Marine megafauna	Dugong	-	-	-	Mod	Dugong species Seagrass meadows
	Species of whales	-	-	-	Min	Minke whales Sperm whales Humpback whales
	Migrating Whales	Min	-	-	-	Humpback whales and calving habitat
	Species of dolphins	Min	-	-	Sig	Australian humpback dolphins
Marine turtles	Breeding colonies of marine turtles	Mod	-	-	Mod	Flatback turtle rookery on Curtis Island Nesting beaches on Facing, Curtis and Wild Cattle Islands, Boyne Island Beach and Tannum Sands
	Green turtle breeding	Min	-	-	Min	
	Marine turtle rookeries	Mod	-	-	Mod	
	Nesting turtles	Min	-	-	-	
Seagrass and macroalgae	Seagrass	Min	Min	Mod	Mod	Seagrass meadows
	Beds of *Halimeda* algae	-	-	Min	-	Beds of *Halimeda* algae
Shorebirds and migratory seabirds	Seabirds	Min	-	Min	Min	Potential foraging habitat
	Shorebirds and migratory birds	-	-	-	Sig	Threatened migratory shorebird species Shorebird habitat and important roost sites (note these vary from year to year)

Table notes: **Min** - Minor; **Mod** - Moderate; **Sig** - Significant; **vii** - Aesthetic values and superlative natural phenomena; **viii** - Ongoing geological processes; **ix** - Ecological and biological processes; **x** - Biodiversity conservation

Category	Local attribute	Relevant OUV criteria and contribution classifications				Summary of the key environmental values
		vii	viii	ix	ix	
Flora, fauna and ecological communities	Threatened and endangered flora and fauna species (including TECs)	Min	-	-	Mod	Coastal Saltmarsh TEC
	Vegetated mountains	Min	-	-	-	Mount Larcom landform
	Mangroves	Min	Min	Min	Min	Various mangrove species
	Mangrove species diversity	-	-	-	Min	Various mangrove species
	Vast mangrove forests	Mod	-	-	-	Mangrove sequences at The Narrows
Continental islands	Continental islands and green vegetated islands	Mod	Mod	-	-	Curtis Island
	Plant species diversity and endemism (species being unique to a defined geographic location)	-	-	-	Sig	Curtis Island
	Vegetation of the continental islands	-	-	Sig	Sig	Curtis Island
Geomorphology	Beaches	Min	-	-	-	Curtis Island beaches Facing Island beaches Boyne Island Beach
	Dune systems	Min	Min	-	-	Parabolic dunes Curtis Island
	River deltas	Min	Min	Min	Min	Marine tidal sand deltas (Curtis Island, Boyne River, Colosseum Inlet)
	Connectivity: cross-shelf, longshore and vertical	-	Min	Min	Min	The Narrows tidal passage
Cultural heritage values	Traditional Owner interaction with the natural environment	-	-	Mod	-	Aboriginal and Torres Strait Islander cultural heritage sites and values
Marine fauna	Diversity supporting marine fauna species (global conservation significance)	Min	-	Min	Mod	A diverse range of marine fauna species
Total species diversity	Total species diversity	Mod	-	Mod	Mod	A diverse range of marine, intertidal and terrestrial flora and fauna species

Table notes: **Min** - Minor; **Mod** - Moderate; **Sig** - Significant; **vii** - Aesthetic values and superlative natural phenomena; **viii** - Ongoing geological processes; **ix** - Ecological and biological processes; **x** - Biodiversity conservation

Appendix D
Potential impacts on environmental values

As described in the EMF in Part D, potential impacts have been identified based on potential development activities that may be needed to support infrastructure and supply chains within the master planned area to the year 2050.

These activities[19] were identified based on the current land uses, potential growth, environmental values, and precinct/zone purposes within existing planning instruments.

These activities were subject to a risk assessment (Aurecon 2016; Aurecon 2017) to determine the likelihood and consequence of potential impacts from development on the environmental values. Where a development activity location was unknown, the potential impacts assumed the highest conservation significance of the value.

The potential impacts from development were identified at a high level for the purpose of the master planning due to the wide range of activities that may occur across the master planning timeframe.

Six broad categories of environmental values were identified as occurring within the master planned area that have the potential to be impacted as a result of development activities, these are:

- terrestrial flora and fauna—including flora and fauna species inhabiting land areas within the master planned area and surrounds, as well as on the continental and inshore islands
- intertidal flora and fauna—including flora and fauna species associated with intertidal habitats, such as shorebirds and migratory birds, mangroves and Coastal Saltmarsh TEC
- marine flora and fauna—including flora and fauna species inhabiting marine areas within the master planned area and surrounds, such as coral reefs, fish, marine megafauna, marine turtles, seagrass and macroalgae
- water quality—including fresh water, groundwater and marine water quality
- social—including heritage properties, socio-economic factors, social and community infrastructure, recreational opportunities and natural scenic amenity
- cultural heritage—including cultural heritage sites and traditional owner interaction with the natural environment.

Geomorphological features (for example beaches, dunes and river deltas), protected areas (for example National Parks and Regional Parks) and heritage properties (for example World, Commonwealth and National Heritage Places) have multiple component environmental values (for example habitat for flora and fauna species, natural scenic amenity and cultural heritage values). As a result, **Table D1** addresses potential impacts on the component environmental values rather than on the geomorphological features, protected areas or heritage properties.

[19] Potential development activities were considered as assumptions only and all project proposals will still require detailed assessment.

Table D1 – Potential impacts from development on environmental values for each master planned area precinct

Potential impacts	Environmental management precinct	Infrastructure and supply chain corridors precinct	Interface precinct	Marine precinct	Marine infrastructure precinct	Marine services and recreation precinct	Port, industry and commerce precinct
Terrestrial flora and fauna							
Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and/or fauna habitat	Yes	Yes	No	No	No	Yes	Yes
Direct mortality and/or injury to terrestrial fauna	Yes	Yes	No	No	No	No	Yes
Increase in noise, vibration, light and/or other disruption to behaviour/life-cycle of terrestrial fauna	Yes	Yes	No	Yes	Yes	Yes	Yes
Disruption to terrestrial fauna behaviour and/or life-cycle due to increased potential for human interaction	Yes	No	No	No	No	No	No
Increase in operational lighting impacting on terrestrial fauna	Yes	Yes	No	No	No	Yes	Yes
Increase in dust impacts on adjacent terrestrial vegetation communities and/or fauna habitat, reducing the condition and quality of adjacent habitats	Yes	Yes	No	Yes	Yes	Yes	Yes
Increased levels of waste materials resulting in reduced terrestrial fauna habitat condition and/or quality	Yes	No	No	No	No	No	Yes
Increased edge effects on adjacent terrestrial vegetation communities and/or fauna habitat, reducing the condition and/or quality of adjacent environments	Yes	Yes	No	No	No	Yes	Yes
Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or fauna habitat	Yes	Yes	No	Yes	Yes	Yes	Yes
Intertidal flora and fauna							
Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of intertidal flora species, vegetation communities and/or fauna habitat	Yes	Yes	No	Yes	Yes	Yes	Yes
Direct mortality and/or injury to intertidal fauna	Yes	Yes	No	Yes	Yes	Yes	Yes
Increase in noise, vibration, light and/or other disruption to behaviour/life-cycle of intertidal fauna	Yes	Yes	No	Yes	Yes	Yes	Yes
Disruption to intertidal fauna behaviour and/or life-cycle due to increased potential for human interaction	Yes	Yes	No	No	Yes	Yes	No
Increase in operational lighting impacting on intertidal fauna	Yes	Yes	No	Yes	Yes	Yes	Yes

Potential impacts	Environmental management precinct	Infrastructure and supply chain corridors precinct	Interface precinct	Marine precinct	Marine infrastructure precinct	Marine services and recreation precinct	Port, industry and commerce precinct
Increase in dust impacts on adjacent intertidal vegetation communities and/or fauna habitat, reducing the condition and quality of adjacent habitats	Yes	Yes	No	Yes	Yes	Yes	Yes
Increased levels of waste materials resulting in reduced intertidal fauna habitat condition and/or quality	Yes	Yes	No	No	Yes	Yes	No
Increased edge effects on adjacent intertidal vegetation communities and/or fauna habitat, reducing the condition and/or quality of adjacent environments	Yes	Yes	No	Yes	Yes	Yes	Yes
Introduction or spread of pest and weed species resulting in reduced condition and/or quality of intertidal vegetation communities and/or fauna habitat	Yes	Yes	No	Yes	Yes	Yes	Yes
Increased edge effects and/or direct loss of important foraging/roosting habitat for shorebirds	Yes	Yes	No	Yes	Yes	Yes	Yes
Marine flora and fauna							
Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of marine flora species, vegetation communities and/or fauna habitat (including benthic communities, coral reefs and seagrass meadows)	No	Yes	No	Yes	Yes	No	Yes
Direct mortality and/or injury to marine fauna	No	Yes	No	Yes	Yes	Yes	No
Increase in noise, vibration, light and/or other disruption to behaviour/life-cycle of marine fauna	No	Yes	No	Yes	Yes	Yes	Yes
Increase in operational lighting impacting on marine fauna	Yes	Yes	No	Yes	Yes	Yes	Yes
Increase in dust impacts on adjacent marine vegetation communities and/or fauna habitat, reducing the condition and quality of adjacent habitats	No	Yes	No	Yes	Yes	Yes	Yes
Increased edge effects on adjacent marine vegetation communities and/or fauna habitat, reducing the condition and/or quality of adjacent environments	Yes	Yes	No	Yes	Yes	No	Yes
Introduction or spread of pest and weed species resulting in reduced condition and/or quality of marine vegetation communities and/or fauna habitat	No	Yes	No	Yes	Yes	No	Yes
Increased edge effects on important nesting habitat for marine turtles	Yes	No	No	Yes	Yes	No	Yes
Beneficial impact that increases the opportunities for establishment of benthic communities and associated marine fauna	No	Yes	No	Yes	Yes	No	No

Potential impacts	Environmental management precinct	Infrastructure and supply chain corridors precinct	Interface precinct	Marine precinct	Marine infrastructure precinct	Marine services and recreation precinct	Port, industry and commerce precinct
Water quality							
Sedimentation and decreased water quality in terrestrial areas resulting in decreased condition and/or quality of environments and downstream areas	Yes	Yes	No	Yes	Yes	Yes	Yes
Sedimentation and decreased water quality in intertidal and/or marine areas resulting in decreased condition and/or quality of environmental values	Yes	Yes	No	Yes	Yes	Yes	Yes
Disturbance of acid sulfate soils decreasing water quality in intertidal and/or marine areas resulting in decreased condition and/or quality of environmental values	Yes	Yes	No	Yes	Yes	Yes	Yes
Alteration of groundwater levels and quality resulting in impacts to surrounding terrestrial environments	Yes	Yes	No	Yes	Yes	Yes	Yes
Alteration of groundwater levels and quality resulting in impacts to surrounding intertidal environments	Yes	Yes	No	Yes	Yes	Yes	Yes
Alteration of groundwater levels and quality resulting in impacts to surrounding marine environments	Yes	Yes	No	Yes	Yes	Yes	Yes
Changes to marine water velocities and potential erosion, sedimentation and decreased water quality impacts resulting in decreased condition and/or quality	No	Yes	No	Yes	Yes	No	Yes
Social							
Decrease in visual amenity for residents, recreational users and tourists	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Impacts on air quality resulting from dust, emissions and odour affecting surrounding areas	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restricting access to foreshore areas for residents and tourists	Yes	Yes	Yes	No	No	Yes	Yes
Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beneficial impact from an increase in public awareness of the OUV of the GBRWHA and other environmental values	Yes	No	No	Yes	No	No	No
Increase in the number of residents and/or tourists experiencing social amenity impacts as a result of construction and/or operation of industrial and port industries within the port, industry and commerce precinct	No	No	Yes	No	No	No	No
Increase in pressure on community infrastructure and services (for example airport; health and emergency services; food, water and electricity supply)	Yes	Yes	No	No	No	No	Yes

Potential impacts	Environmental management precinct	Infrastructure and supply chain corridors precinct	Interface precinct	Marine precinct	Marine infrastructure precinct	Marine services and recreation precinct	Port, industry and commerce precinct
Increase in demand for rental/sale properties which may result in decrease in housing affordability if the demand exceeds the supply of housing	No	Yes	No	No	No	No	Yes
Decrease in social/community cohesion due to influx of temporary workforce, potentially leading to increased social and health related issues	No	Yes	No	No	No	No	Yes
Cultural heritage							
Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	Yes	Yes	No	Yes	Yes	Yes	Yes
Loss of traditional owner access to land as a result of construction and/or operation of infrastructure	Yes	Yes	No	Yes	Yes	No	Yes

Appendix E
EMF objectives

EMF objectives have been identified for each of the master planned area precincts to avoid, mitigate and/or offset potential impacts from development within the master planned area on environmental values, including the OUV of the GBRWHA, MNES and MSES.

Table E1 outlines the EMF objectives for managing potential impacts from development within each of the precincts of the master planned area. These objectives may refer to environmental values surrounding the precinct or master planned area to ensure management is not restricted to a geographical boundary[20]. Due to the range of potential development activities within the master planned area, the different potential impact pathways, varying sensitivities of receptors, and different biological traits of receptors (for example behaviours and responses to stress), the surrounding areas may not be consistent for each precinct.

Table E1 – EMF Objectives

Precinct	EMF Objectives
Environmental management precinct	Avoid, mitigate and/or offset potential impacts (direct, indirect and cumulative) from development within the precinct on the Facing Island environmental values. Particular attention must be given to avoiding impact on: • marine turtle nesting beaches and habitat • TECs listed under the EPBC Act • Endangered and Of concern Regional Ecosystems listed under the *Vegetation Management Act 1999* (VM Act) • conservation significant fauna habitat listed under the EPBC Act and/or NC Act (including migratory species under the EPBC Act) • migratory shorebird habitat • coral reefs • island vegetation and fauna species diversity • natural scenic amenity values • dune systems and beaches.
	Avoid, mitigate and/or offset potential impacts (direct, indirect and cumulative) from development within the precinct on the Curtis Island environmental values. Particular attention must be given to avoiding impact on: • island vegetation and fauna species diversity • natural scenic amenity values • marine turtle nesting beaches and habitat • migratory shorebird habitat • TECs listed under the EPBC Act • Endangered and Of concern Regional Ecosystems listed under the VM Act • conservation significant fauna habitat listed under the EPBC Act and/or NC Act (including migratory species under the EPBC Act) • coral reefs.

[20] For example, the source of an impact may be within the environmental management precinct but the objective may relate to managing impacts on environmental values within the marine precinct.

Precinct	EMF Objectives
	Avoid, mitigate and/or offset potential impacts (direct, indirect and cumulative) from development within the precinct on the inshore islands [21], Mount Larcom landform and Aldoga reserve environmental values. Particular attention must be given to avoiding impact on: • TECs listed under the EPBC Act • Endangered and Of Concern Regional Ecosystems listed under the VM Act • conservation significant flora species and fauna species habitat listed under the EPBC Act and/or NC Act (including migratory species under the EPBC Act) • cultural heritage values • natural scenic amenity values.
	Increase the understanding of the presence and contribution of attributes that contribute to the local expression of the OUV of the GBRWHA, and habitat value for other EPBC Act and NC Act conservation significant fauna species and marine plants.
	Collect information that monitors changes to the environmental values and confirms the impact from development within the master planned area on the OUV of the GBRWHA and other environmental values.
	Limit future development within the precinct to low impact recreational and nature-based activities or necessary infrastructure (where no other alternative is available) that does not impact on the OUV of the GBRWHA and other environmental values.
	Maintain appropriate access to areas that provide Aboriginal and Torres Strait Islander cultural heritage values and natural scenic amenity values to residents, recreational users and tourists that contribute to the OUV of the GBRWHA.
Infrastructure and supply chain corridors	Support development within the precinct that operates efficiently and effectively, in a manner that appropriately balances industrial, commercial, recreational and cultural activities, and potential impacts from development on the OUV of the GBRWHA and other environmental values.
	Avoid, mitigate and/or offset potential impacts (direct, indirect and cumulative) from development within the precinct on the following environmental values: • seagrass meadows and deep water seagrass meadows • mangroves and other intertidal plants • marine plants • migratory shorebird habitat and populations • marine faunal groups diversity • marine water quality • cultural heritage values • natural scenic amenity values • turtle nesting beaches.
Interface	Ensure future residential development within the precinct, excluding dwelling houses, is appropriately designed to avoid and/or mitigate potential amenity impacts to residents. This may include, for example, design measures and other controls that avoid and/or mitigate noise, light, visual amenity and air quality impacts from adjoining port and industrial land uses.
	Ensure future port development within the precinct is appropriately designed and located to avoid and/or mitigate potential amenity impacts on sensitive land uses, including residential areas. This may include, for example, design measures and other controls that avoid and/or mitigate noise, light, visual amenity and air quality impacts on adjoining sensitive land uses.
Marine infrastructure	Maintain port access to and continued development of shipping channels and waterside areas in a manner that appropriately balances industrial, commercial, recreational and cultural activities and potential impacts on the OUV attributes of the GBRWHA and other environmental values.

[21] Inshore islands include Quoin, Compigne, Turtle, Diamantina, Witt, Picnic, She Oak, Rat and Garden islands, and Bushy Islet

Precinct	EMF Objectives
	Where practical, avoid, mitigate and/or offset direct disturbance from development within the precinct on the following environmental values: • Facing Island and Quoin Island seagrass meadows • inshore turbid reefs and fringing reefs, including coral reefs associated with East Banks (East and West) • important shorebird roosting habitat at North Passage and South Passage islands, Boyne Island Beach, shorebird habitat associated with Curtis Island, Facing Island and the other inshore islands.
	Avoid, mitigate and/or offset impacts (direct, indirect and cumulative) from development within the precinct on the following environmental values: • seagrass meadows and deep water seagrass meadows • mangroves and other intertidal plants • marine plants • migratory shorebird habitat and populations • turtle nesting beaches • marine faunal groups diversity • marine water quality • cultural heritage values • natural scenic amenity values • ongoing sustainable use of the marine waters by marine turtles and other marine reptiles, dugongs, dolphins, seabirds, whales, coral reefs, benthic communities, fish and other nekton • ongoing sustainable use of marine waters and near shore intertidal areas for recreational and commercial fishing.
	Increase the understanding of the presence and contribution of attributes that contribute to the local expression of the OUV of the GBRWHA, and habitat value for other EPBC Act and NC Act species and marine plants.
	Collect information to monitor changes to the environmental values and confirm the impact from development within the precinct on the OUV of the GBRWHA and other environmental values.
Marine	Avoid, mitigate and/or offset impacts (direct, indirect and cumulative) from development within the precinct on environmental values. Particular attention must be given to avoiding impact on: • Pelican Banks North, Pelican Banks South, Facing Island and Quoin Island seagrass meadows • inshore turbid reefs and fringing reefs, including coral reefs on the seaward side of Curtis Island and Facing Island, coral reefs associated with Seal Rocks, Turtle Island Reef, Bushy Reef and Manning Reef • turtle nesting beaches • Kangaroo Island wetland and important shorebird roosting habitat at North Passage and South Passage islands, South Trees Inlet, Boyne Island Beach, shorebird habitat associated with Curtis Island, Facing Island and other inshore islands.
	Avoid, mitigate and/or offset impacts (direct, indirect and cumulative) from development within the precinct on the following environmental values: • other seagrass meadows (that is, excluding Pelican Banks Norths, Pelican Banks South, Facing Island and Quoin Island seagrass meadows addressed in the objective above) • mangroves and other intertidal plants • marine plants • migratory shorebird habitat and populations • marine faunal groups diversity • marine water quality • cultural heritage values • natural scenic amenity values • ongoing sustainable use of the marine waters by marine turtles and other marine reptiles, dugongs, dolphins, seabirds, whales, coral reefs, benthic communities, fish and other nekton • ongoing sustainable use of marine waters and near shore intertidal areas for recreational and commercial fishing.

Precinct	EMF Objectives
	Increase the understanding of the presence and contribution of attributes that contribute to the local expression of the OUV of the GBRWHA, and habitat value for other EPBC Act and NC Act species and marine plants.
	Collect information to monitor changes to the environmental values and confirm the impact from development within the precinct on the OUV of the GBRWHA and other environmental values.
	Allow port development to occur where it is necessary to support development within the marine infrastructure precinct and/or the port, industry and commerce precinct in a manner that appropriately balances industrial, commercial, recreational and cultural activities, and potential impacts on the OUV of the GBRWHA and other environmental values.
Marine services and recreation	Avoid, mitigate and/or offset impacts (direct, indirect and cumulative) from development within the precinct on the following environmental values: • TECs listed under the EPBC Act • habitat for conservation significant fauna species listed under the NC Act and/or EPBC Act • migratory shorebird habitat and populations • mangroves and other marine plants • wetlands • marine species diversity (flora and fauna) • marine water quality • cultural heritage values • natural scenic amenity values.
	Maintain safe access to the waterfront and harbour for commercial operations, residents, recreational users and tourists.
Port, industry and commerce	Avoid, mitigate and/or offset impacts (direct, indirect and cumulative) from development within the precinct on the following environmental values: • TECs listed under the EPBC Act • Endangered and Of concern Regional Ecosystems listed under the VM Act • conservation significant flora species and fauna species habitat listed under the EPBC Act and NC Act • migratory shorebird habitat and populations • natural scenic amenity values and recreational opportunities of the coastal zone • cultural heritage values • turtle nesting beaches.
	Increase the understanding of the importance of habitat for the long-term conservation of species protected under the EPBC Act, NC Act, marine plants and fish.
	Maintain appropriate access to areas that provide Aboriginal and Torres Strait Islander cultural heritage values and natural scenic amenity values to residents, recreational users and tourists that contribute to the OUV of the GBRWHA.
	Avoid and/or mitigate impacts (direct, indirect and cumulative) from development within the precinct on cultural heritage and social values.

Appendix F
Definitions

Term	Definition
avoid, mitigate and/ or offset	see the State Development Assessment Provisions and the avoid-mitigate-offset framework within the Queensland Environmental Offset Policy.
beneficial reuse	dredged material that provides social, economic or environmental benefits (or a combination of these). That is, the dredged material is managed as a valuable resource rather than a product destined for disposal. Beneficial reuse can involve the placement of dredged material on-land and in the aquatic zone (i.e. underwater or in intertidal areas). Consideration of beneficial reuse in the Queensland context to date has been focused on applications that provide economic benefits such as on-land processing and industry reuse or land reclamation (Royal Haskoning DHV and AMA 2016).
capital dredging	see *Sustainable Ports Development Act 2015* (Ports Act), schedule 1.
coastal zone	see the *Coastal Protection and Management Act 1995*, section 15.
dredged material	capital and maintenance dredged material required for the ongoing operation and future expansion of the port.
dwelling house	see the Gladstone Regional Council planning scheme – a residential use of premises for one household that contains a single dwelling. The use includes domestic out buildings and works normally associated with a dwelling and may include a secondary dwelling.
ecologically sustainable development	see *Environment Protection and Biodiversity Conservation Act 1999*, section 3A.
environmental value	see the *Environmental Protection Act 1994*, section 9.
fringing reef	intertidal to subtidal reefs that grow along the mainland or around the margins of continental high islands (Smithers 2011).
Great Barrier Reef coastal zone	the areas adjacent to the Great Barrier Reef and includes Queensland waters, islands and adjacent inland areas, five kilometres (inland and 10 metres Australian Height Datum, whichever is further).
Great Barrier Reef World Heritage Area	The GBRWHA extends from the top of Cape York in north-east Australia to just north of Bundaberg, and from the low water mark on the Queensland coast to the outer boundary of the GBRMP, which is beyond the edge of the continental shelf. The area was declared a World Heritage Area in 1991 because of its OUV. About 99 per cent of the World Heritage Area is within the GBRMP but encompasses: • some 980 islands which are under Queensland jurisdiction • some internal waters of Queensland (for example, some deep bays, narrow inlets or channels between islands) • all waters seaward of the low water mark from north of Bundaberg to Cape York.
highest astronomical tide (HAT)	the highest level which can be predicted to occur under average meteorological conditions and any combination of astronomical conditions.
High Productivity Vehicles	road freight transport vehicles which have increased transport efficiency over contemporary heavy vehicles.

Term	Definition
inshore turbid reef	are generally located in turbid water which is shallower than 10 metres, and are usually located within 10 kilometres of the coast. Inshore turbid reefs include both shore attached (fringing reefs in locations close to the mainland) and non-shore attached shoals (Whiteway et al. 2014).
land management plan area	an area within the environmental management precinct of the master planned area shown on a land management plan area map required to be managed in accordance with a land management plan prepared for the area under the provisions of the port overlay.
local expression of the Outstanding Universal Value of the Great Barrier Reef World Heritage Area	environmental values present within and surrounding the priority Port of Gladstone master planned area that contribute to the OUV of the GBRWHA. The local expression of the OUV of the GBRWHA within and surrounding the priority Port of Gladstone master planned area has been identified as part of the evidence base and is specifically referred to in the master plan's EMF.
maintenance dredging	dredging carried out for the purposes of removing sediments accumulated in existing channels, berths, approaches and swing basins of a port to maintain an approved capital dredging profile.
marine megafauna	large marine species which may include cetaceans (whales and dolphins), reptiles (marine turtles), dugongs, chondrichthyes (sharks, rays, skates and chimaeras) and pinnipeds (seals or sea lions).
marine parks	see Ports Act, section 6(4).
marine plants	see the *Fisheries Act 1994*, section 8.
master planned area	see Ports Act, section 6 (1), however for this master plan means all of the area shown in Appendix A.
material placement area or areas	one (or more) existing and future potential material placement areas to be defined in the port overlay for the beneficial reuse and placement of dredged material, until such time as the material placement has been completed and the area is suitable for ground improvement works, or the area is no longer determined to be suitable for material placement.
matters of national environmental significance	see *Environment Protection and Biodiversity Conservation Act 1999*, section 34.
matters of state environmental significance	as defined under the *Environmental Offsets Regulation 2014* and a component of the biodiversity state interest that is defined under the *State Planning Policy*.
offsets (environmental offset)	see *Environmental Offsets Act 2014*, section 7(2), and the relevant Commonwealth and state policies.
Outstanding Universal Value (OUV)	as defined in the UNESCO Operational Guidelines for the Implementation of the World Heritage Convention means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole (UNESCO 2017).
planning instrument	for the purposes of the master plan, see *Planning Act 2016*, section 8 (1), land use plan under the *Transport Infrastructure Act 1994*, section 285, an approved development scheme under the *State Development and Public Works Organisation Act 1971*, Schedule 2, and development scheme under the *Economic Development Act 2012*, Schedule 1.
port-related development or port-related activities	development or activities carried out for or in association with core port, industrial or commercial activities necessary for the efficient functioning of the priority Port of Gladstone supply chain and future priority Port of Gladstone trade and economic growth for the region.

Term	Definition
port limits	see *Transport Infrastructure (Ports) Regulation 2016*, schedule 2, part 2, section 7.
port optimisation	the act of making a port system, design or decision as effective or functional as possible. This may include for example, making efficient use of strategic port land, berths and/or land-based facilities, ability to control berthing allocations and scheduling, minimising capital intensive marine-based infrastructure, minimising the distance between land-based facilities and berths and/or minimising capital or maintenance dredging. Port optimisation requires a balance to be achieved across a number of these issues. For port infrastructure, optimisation usually centres on the resources that are scarcest. However, different development may require different aspects of the infrastructure to be optimised, having regard to the economic, environmental and social context of the project.
port overlay	see Ports Act, section 19.
precincts	zones of development intent for specific areas within the master planned area.
priority management measures	see Ports Act, section 8 (1)(c)(iii).
priority ports	see Ports Act, section 5.
responsible entity	means the entity or entities responsible for implementation of a priority management measure.
sensitive land use or uses	see the *Planning Regulation 2017*.
strategic port land	see the *Transport Infrastructure Act 1994*, section 267.
subterranean infrastructure	infrastructure constructed and operated below the seafloor.
supply chain infrastructure	infrastructure, services and utilities identified as critical to supporting the future functioning of the priority Port of Gladstone, and its associated trade and economic growth for the region. This includes, for example road and rail infrastructure and links, above and below ground linear infrastructure (for example water, oil, or gas pipelines, conveyors), infrastructure nodes (for example power station, treatment plant, extractive resources), transmission lines that service and link the priority Port of Gladstone and industry development.

Appendix G
Abbreviations and acronyms

Acronym/ abbreviation	Definition
CQRP	*Central Queensland Regional Plan*
EIS	environmental impact statement
EMF	environmental management framework
EP Act	*Environmental Protection Act 1994*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERA	environmentally relevant activity
ESD	ecologically sustainable development
GBRWHA	Great Barrier Reef World Heritage Area
GPC	Gladstone Ports Corporation
GPC LUP	Gladstone Ports Corporation land use plan: *2012 Land Use Plan: Version 2 - February 2016*
GRC	Gladstone Regional Council
GRC planning scheme	Gladstone Regional Council planning scheme: *Our Place Our Plan Gladstone Regional Council Planning Scheme*
GSDA	Gladstone State Development Area
GSDA development scheme	*Gladstone State Development Area Development Scheme*
HAT	highest astronomical tide
Independent Review	*Independent Review of the Port of Gladstone*
LMDMP	Long-Term Maintenance Dredging Management Plan
LNG	liquefied natural gas
Maintenance Dredging Strategy	*Maintenance Dredging Strategy for Great Barrier Reef World Heritage Area Ports*
MNES	matters of national environmental significance
MSES	matters of state environmental significance

Acronym/ abbreviation	Definition
NC Act	*Nature Conservation Act 1992*
OUV	Outstanding Universal Value
PMM	priority management measure
Ports Act	*Sustainable Ports Development Act 2015*
QTRIP	Queensland Transport and Roads Investment Program
QTS	Queensland Transport Strategy (draft)
Reef 2050 Plan	*Reef 2050 Long-Term Sustainability Plan*
SDPWO Act	*State Development and Public Works Organisation Act 1971*
SPL	strategic port land
SPP	State Planning Policy
TCP	*Transport Coordination Plan 2017–2027*
TEC	threatened ecological community
TMR	Department of Transport and Main Roads
TUMRA	Traditional Use of Marine Resource Agreement
UNESCO	United Nations Educational, Scientific and Cultural Organization
VM Act	*Vegetation Management Act 1999*

Appendix H
References

Adaptive Strategies, GHD and RMC 2017, *Method for identifying the presence of Outstanding Universal Value within the Great Barrier Reef World Heritage Area*, Prepared for Queensland Department of State Development, Adaptive Strategies, Brisbane.

AECOM 2016, *Master planning evidence base assessment – Priority Port of Gladstone*, prepared for the Queensland Department of State Development, AECOM, Brisbane.

Aurecon 2016, *Risk Assessment – Priority Port of Gladstone*, prepared for the Queensland Department of State Development, Aurecon, Brisbane.

Aurecon 2017, *Addendum to evidence base – Priority Port of Gladstone*, prepared for the Queensland Department of State Development, Aurecon, Brisbane.

Australian Maritime Safety Authority (AMSA) 2014, *North-East Shipping Management Plan*, Australian Maritime Safety Authority, Canberra.

Birdlife Australia 2015, *Potential habitat for migratory shorebirds*, Birdlife Australia, Victoria.

BMT WBM 2014, *Identification of Coral Reef Sites for Restoration and Enhancement in Port Curtis* – Phase 1, Report produced for the Ecosystem Research and Monitoring Program Advisory Panel as part of Gladstone Ports Corporation's Biodiversity Offset Strategy.

Bryant, CV & Rasheed, MA 2013, *Gladstone Permanent Transect Seagrass Monitoring* – December 2013 Updated Report, Centre for Tropical Water & Aquatic Ecosystem Research (TropWATER), James Cook University, Cairns.

Clifton, D. and Bell, I. 2000, *Facing Island Turtle Nesting Survey 1999–2000*, Prepared for Gladstone Port Authority and Queensland Parks and Wildlife Service.

Coffey Environments 2013, *Supplementary Report to the Arrow LNG Plant EIS – Turtle nesting at Settlement Bay*, Coffee Environments.

Commonwealth of Australia 2015, *Reef 2050 Long-Term Sustainability Plan*, Commonwealth of Australia, Canberra.

Commonwealth of Australia 2018, *Reef 2050 Long-Term Sustainability Plan—* July 2018, Commonwealth of Australia, Canberra.

Davies, JD, Bryant, CV, Carter, AB and Rasheed, MA 2016, *Seagrasses in Port Curtis and Rodds Bay 2015: Annual long-term monitoring*, Centre for Tropical Water & Aquatic Ecosystem Research (TropWATER) Publication 16/02, James Cook University, Cairns.

Department of Aboriginal and Torres Strait Islander and Multicultural Affairs (DATSIMA) 2013, *Cultural heritage locations in the Queensland Heritage Register*, Department of Aboriginal and Torres Strait Islander and Multicultural Affairs, Brisbane.

Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP) 2004, *Aboriginal Cultural Heritage Act 2003 Duty of Care Guidelines*, Queensland Government, Brisbane.

Department of Agriculture and Fisheries (DAF) 2016, *Queensland waterways for waterway barrier works*, Department of Agriculture and Fisheries, Brisbane.

Department of Agriculture and Fisheries (DAF) 2015, *Dugong protection areas*, Department of Agriculture and Fisheries, Brisbane.

Department of Environment and Heritage Protection (DEHP) 2005, *Directory of important wetlands*, Department of Environment and Heritage Protection, Brisbane.

Department of Environment and Heritage Protection (DEHP) 2016, *Queensland Heritage Register*, Department of Environment and Heritage Protection, Brisbane.

Department of Environment and Science (DES) 2016, *Biodiversity Planning Assessment* – South East Queensland (version 4.1), Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017a, *Marine and estuarine water types*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017b, *Matters of State Environmental Significance Declared fish habitat area*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017c, *Matters of State Environmental Significance Regulated vegetation (intersecting a watercourse)*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017d, *Matters of State Environmental Significance High ecological value waters (wetland)*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017e, *Matters of State Environmental Significance High ecological significance wetlands*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017f, *Matters of State Environmental Significance High ecological value waters*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017g, *Matters of State Environmental Significance Protected area (nature refuges)*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017h, *Matters of State Environmental Significance Protected area (estates)*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2017i, *Matters of State Environmental Significance Marine park*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2018a, *Protected areas of Queensland*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2018b, *Biodiversity Planning Assessment – Brigalow Belt (version 2.1)*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2018c, *Matters of State Environmental Significance Wildlife habitat*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2018d, *Matters of State Environmental Significance Regulated vegetation (category B - endangered or Of concern)*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2018e, *Matters of State Environmental Significance Regulated vegetation (category C - endangered or Of concern)*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2018f, *Matters of State Environmental Significance Regulated vegetation (essential habitat)*, Department of Environment and Science, Brisbane.

Department of Environment and Science (DES) 2018g, *Nature Conservation Act 1992 Protected plants for a survey trigger mapping*, Department of Environment and Science, Brisbane.

Department of Environment, Water, Heritage and the Arts 2009, *National Assessment Guidelines for Dredging*, Commonwealth of Australia, Canberra.

Department of Industry Innovation and Science, Office of Northern Australia 2015, *Our North, Our Future: White Paper on Developing Northern Australia*, Department of Industry, Innovation and Science, Canberra.

Department of Infrastructure, Local Government and Planning (DILGP) 2016, *State Infrastructure Plan Part A: Strategy*, Department of Infrastructure, Local Government and Planning, Brisbane.

Department of Infrastructure, Local Government and Planning (DILGP) 2017, *State Planning Policy*, Department of Infrastructure, Local Government and Planning, Brisbane.

Department of Natural Resources, Mines and Energy (DNRME) 2018a, *Regional ecosystems: Vegetation management regional ecosystem and remnant mapping (Version 10.1)*, Department of Natural Resources and Mines, Brisbane.

Department of Natural Resources, Mines and Energy (DNRME) 2018b, *Essential habitat (Version 7.02), Department of Natural Resources and Mines*, Brisbane.

Department of Natural Resources, Mines and Energy (DNRME) 2018c, *Cadastral data Queensland series 2018*, Department of Natural Resources, Mines and Energy, Brisbane.

Department of State Development (DSD) 2015, *Gladstone State Development Area Development Scheme*, Department of State Development, Brisbane.

Department of State Development (DSD) 2016, *Priority Port of Gladstone master planned area boundary*, Department of State Development, Brisbane.

Department of State Development, Infrastructure and Planning (DSDIP) 2013, *Central Queensland Regional Plan*, Department of State Development, Brisbane.

Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP) 2018, *State Infrastructure Plan Part B: Program – 2018 update*, Department of State Development, Manufacturing, Infrastructure and Planning, Brisbane.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2013a, *Independent Review of the Port of Gladstone Report on Findings July 2013*, Commonwealth of Australia, Canberra.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2013b, *Independent Review of the Port of Gladstone Supplementary Report October 2013*, Commonwealth of Australia, Canberra.

Department of the Premier and Cabinet (DPC) 2018, *Our Future State: Advancing Queensland's Priorities*, Department of the Premier and Cabinet, Brisbane.

Department of Transport and Main Roads (TMR) 2016, *Maintenance Dredging Strategy for Great Barrier Reef World Heritage Area Ports*, Department of Transport and Main Roads, Brisbane.

Department of Transport and Main Roads (TMR) 2017a, *Port Procedures and Information for Shipping – Gladstone*, Department of Transport and Main Roads, Brisbane.

Department of Transport and Main Roads (TMR) 2017b, *Transport Coordination Plan 2017–2027*, Department of Transport and Main Roads, Brisbane.

Department of Transport and Main Roads (TMR) 2018, *Queensland Transport and Roads Investment Program (QTRIP) 2018–19 to 2021–22*, Department of Transport and Main Roads, Brisbane.

ESRI 2014, *World Shaded Relief Base*, Esri Australia, Brisbane.

Gladstone Ports Corporation 2016, *2012 Land Use Plan: Version 2 - February 2016*, Gladstone Ports Corporation, Gladstone.

Gladstone Ports Corporation 2018, *Annual report 2017-18*, Gladstone Ports Corporation, Gladstone.

Gladstone Regional Council 2015a, *Local Heritage Register*, Gladstone Regional Council, Gladstone.

Gladstone Regional Council 2015b, *Gladstone Region Economic Development Strategy*, Gladstone Regional Council, Gladstone.

Gladstone Regional Council 2016, *Our Place Our Plan Gladstone Regional Council Planning Scheme 2015*, Gladstone Regional Council, Gladstone.

Great Barrier Reef Marine Park Authority (GBRMPA) 2009a, *Great Barrier Reef Features – Indicative reef boundaries and rocks*, GBRMPA, Townsville.

Great Barrier Reef Marine Park Authority (GBRMPA) 2009b, *Great Barrier Reef Coast Marine Park - zoning and reef mapping*, GBRMPA, Townsville.

Great Barrier Reef Marine Park Authority (GBRMPA) 2010, *Great Barrier Reef Marine Park boundary*, GBRMPA, Townsville.

Great Barrier Reef Marine Park Authority (GBRMPA) 2014, *Great Barrier Reef Outlook Report 2014*, GBRMPA, Townsville.

Hamann M., Limpus C.J., Shimada T. and Preston S. 2015a, *Annual report on green turtle tracking and habitat use in Port Curtis*. Report produced for the Ecosystem Research and Monitoring Program Advisory Panel.

Hamann M., Shimada T. and Limpus C.J. 2015b, *Annual report on the internesting habitat use by flatback turtles off the Curtis Island coast – 2013–2014 nesting season*. Report produced for the Ecosystem Research and Monitoring Program Advisory Panel.

Hamann M., Wildermann N. Daff K. and Limpus C.J. 2015c, *Annual report on the inter-nesting habitat use by flatback turtles off the Curtis Island coast – 2014–2015 nesting season*. Report produced for the Ecosystem Research and Monitoring Program Advisory Panel.

Hamann M., Limpus C.J., Shimada T., and Preston S. 2016, *Annual report on green turtle tracking and habitat use in Port Curtis – Year 2 (2015)*. Report produced for the Ecosystem Research and Monitoring Program Advisory Panel.

Hamann, M., Limpus, C.J., Shimada, T. and Preston, S. 2017a, *Final report on green turtle habitat use in Port Curtis 2014 to 2017*. Produced for the Ecosystem Research and Monitoring Program Advisory Panel.

Hamann M., Wildermann N. Williams G, Daff K. and Limpus C.J. 2017b, *Final report on inter-nesting habitat use by flatback turtles off the Curtis Island coast - 2013 to 2015*. Produced for the Ecosystem Research and Monitoring Program Advisory Panel.

Hodge, W., Limpus, C.J and Smissen, P. 2006, *Queensland Turtle Conservation Project: Hummock Hill Island Nesting Turtle Study December 2006*, produced by Environmental Protection Agency.

Infrastructure Australia 2011, *National Ports Strategy*, Infrastructure Australia, Sydney.

Infrastructure Australia 2016, *Australian Infrastructure Plan*, Infrastructure Australia, Sydney.

Limpus, CJ. and Gilmore, K. 1999, *Queensland Turtle Conservation Project, Port Curtis Turtle Monitoring 1998–1999 season*.

Limpus, CJ., Gilmore, K. and Barrett, P. 2000, *Queensland turtle conservation project – Curtis Island Marine Turtle Marine Turtle Nesting Study: 1999–2000*, Prepared for Gladstone Port Authority and Queensland Park and Wildlife Service, Gladstone.

Limpus, CJ., Barrett, P., McLaren, G., McLaren, M., and Knuckey 2005, *Queensland Turtle Conservation Project, Curtis Island Study 2004-2005*.

Limpus, CJ., McLaren, M., McLaren, G. and Knuckey, B. 2006, *Queensland Turtle Conservation Project: Curtis Island and Woongarra Coast Flatback Turtle Studies 2005–2006*, Environment Protection Agency, Brisbane.

Limpus C, Parmenter, J & Chaloupha, M 2013, *Monitoring of Coastal Turtles in the Port Curtis and Port Alma Region: Gap Analysis Parts 1 to 6*, Report produced for the Ecosystem Research and Monitoring Program Advisory Panel as part of Gladstone Ports Corporation's Ecosystem Research and Monitoring Program.

Limpus, CJ., Gatley, C., McLaren, M., McLaren, G., Pearson, R. 2014, *EHP Threatened Species Unit Turtle Conservation Project: Curtis Island and Woongarra Coast Flatback Turtles 2014–2015 breeding season*.

Limpus, CJ., McLaren, M., McLaren, G., Gatley, C., Limpus, CJ., O'Leary, K., Turner, T. 2016, *Marine Turtle Nesting Populations: Curtis Island Flatback Turtles 2015–2016 breeding season*.

Limpus, CJ., FitzSimmons, NN., Sergeev, JM., Ferguson, J., Hoffmann, F., Phillot, A., Pople, L., Ross, A., Tompkins, B., Turner, T., and Wenk, L. 2017, *Marine turtle nesting populations: flatback turtle, Natator depressus, 2016–2017 breeding season at Curtis Peak and Avoid Islands*. Brisbane: Department of Environment and Heritage Protection, Queensland Government. Report produced for the Ecosystem Research and Monitoring Program Advisory Panel.

McKenna, SA, Bryant, CV, Tol, SJ & Rasheed, MA 2014, *Baseline assessment of benthic communities (algae and macro-invertebrates) in the Port Curtis Region November 2013*, Centre for Tropical Water & Aquatic Ecosystem Research (TropWATER), James Cook University, Cairns, 27pp.

National Native Title Tribunal (NNTT) 2018, *Determinations of Native Title and Registered and Notified Indigenous Land Use Agreements,* Commonwealth of Australia, Canberra.

National Research Infrastructure for Australia (NCRIS), 2015, *Atlas of Living Australia Database Search Tool*, NCRIS, Canberra. http://www.ala.org.au/ viewed 11 February 2016.

North-East Shipping Management Group 2014, *North-East Shipping Management Plan*, Australian Maritime Safety Authority, Canberra.

PSA Consulting 2016, *Infrastructure and supply chain analysis – Priority Port of Gladstone*, prepared for the Queensland Department of State Development, PSA Consulting, Brisbane.

Queensland Herbarium 2016, *Herbrecs data extract*, Department of Science, Information Technology and Innovation, Brisbane.

Rasheed, M, Wells, J & Carter, A. 2017, *Seagrasses in Port Curtis and Rodds Bay 2016: Annual long-term monitoring*, Centre for Tropical Water and Aquatic Ecosystem Research (TropWATER), Publication 17/02, James Cook University, Cairns

Rasheed, MA, Thomas, R, Roelofs, AJ Neil, KM & Kerville, SP 2003, *Port Curtis and Rodds Bay seagrass and benthic macro-invertebrate community baseline survey, November/December 2002*, Department of Primary Industries, Cairns.

Reinhold, L., Barrett, P., Limpus, CJ. 1997, *Curtis Island Sea Turtle Nesting Report 1996*.

Royal Haskoning DHV and the Australasian Marine Associates (AMA) 2016, *Maintenance Dredging Strategy for Great Barrier Reef World Heritage Area Ports: Technical Supporting Document*, prepared for the Department of Transport and Main Roads, Royal Haskoning DHV and AMA, Burleigh Heads.

Smithers SG 2011, Fringing Reefs, in Hopley, D., ed., *Encyclopedia of Modern Coral Reefs*: Dortrecht, Springer, p. 430-446.

Sobtzick, S, Grech, A, Coles, R, Cagnazzi, D & Marsh, H, 2013, *Status of the dugong population in the Gladstone area. A Report for Gladstone Ports Corporation Limited for Project CA 20017: Monitoring of Dugongs*, Centre for Tropical Water & Aquatic Ecosystem Research (TropWATER) Publication, James Cook University, Townsville.

State of Queensland 2018, *Queensland Tourism and Transport Strategy*, Queensland Government, Brisbane.

Thomas, R, Unsworth, RKF & Rasheed, MA 2010, *Seagrasses of Port Curtis and Rodds Bay and long term seagrass monitoring, November 2009*, Department of Employment, Economic Development and Innovation, Cairns.

UNESCO 2012a, *Decisions adopted by the World Heritage Committee at its 36th Session, 36 COM WHC-12/36. COM/19*, Saint Petersburg.

UNESCO 2012b, *Statement of Outstanding Universal Value*, Great Barrier Reef, Property ID 154.

UNESCO 2017, *Operational Guidelines for the Implementation of the World Heritage Convention*, UNESCO World Heritage Centre, Paris.

Whiteway, T, Smithers, S, Potter, A, Brooke, B 2014, *Geological and geomorphological features of Outstanding Universal Value in the Great Barrier Reef World Heritage Area*. Record 2014/02. Geoscience Australia, Canberra. http://dx.doi.org/10.11636/ Record.2014.002.

Vision Environment 2015, *Port of Gladstone Gatcombe and Golding Cutting Channel Duplication Project Environmental Impact Statement. Reef and Nekton Baseline Data Collection, August 2015*, Vision Environment, Gladstone.

Wildlife Unlimited 2013, *Report for Migratory Shorebird Monitoring Port Curtis and the Curtis Coast Annual Summer Survey – 2013*, Report produced for the Ecosystem Research and Monitoring Program Advisory Panel as part of Gladstone Ports Corporation's Ecosystem Research and Monitoring Program.

Wildlife Unlimited 2015, *Gladstone Ports Corporation Report for Migratory Shorebird Monitoring Port Curtis and the Curtis Coast Annual Summer Survey – 2015*, Report produced for the Ecosystem Research and Monitoring Program Advisory Panel as part of Gladstone Ports Corporation's Ecosystem Research and Monitoring Program.

Wildlife Unlimited 2016, Gladstone Ports *Corporation Report for Migratory Shorebird Monitoring Port Curtis and the Curtis Coast Annual Summer Survey – 2016*, Report produced for the Ecosystem Research and Monitoring Program Advisory Panel as part of Gladstone Ports Corporation's Ecosystem Research and Monitoring Program.

Wildlife Unlimited 2017, Gladstone Ports *Corporation Report for Migratory Shorebird Monitoring, Port Curtis and the Curtis Coast Annual Summer Survey – 2017*, Report produced for the Ecosystem Research and Monitoring Program Advisory Panel as part of Gladstone Ports Corporation's Ecosystem Research and Monitoring Program.

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