

Priority port master planning

Evidence base documentation

Risk assessment

Priority Port of Gladstone

Queensland | Australia | August 2016

The Department of State Development

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Executive summary

Background

Master planning for priority ports is one of the port-related actions of the Reef 2050 Long-Term Sustainability Plan (Reef 2050), and is mandated under the *Sustainable Ports Development Act 2015* (Qld) (Ports Act). Priority port master planning has a timeframe up to 2050 to align with the Reef 2050.

The port master planning process requires the consideration of a range of issues and interests beyond the limits of Strategic Port Land (SPL), with the overarching purpose to:

- Define a long term strategic vision and associated objectives for the master planned area
- Articulate the state interests in relation to the priority ports and how these interests will be considered in all planning decisions made regarding the master planned area
- Present an environmental management framework (EMF) for the master planned area that reflects the principles of ecologically sustainable development (ESD)

Under the Ports Act, the Port of Gladstone is defined as one of the priority ports in Queensland (others include Port of Abbot Point, Ports of Hay Point and Mackay, and Port of Townsville), requiring a port master plan to ensure sustainable development of the port into the future. The Gladstone port master plan is currently being drafted by the Department of State Development (DSD), and this risk assessment is being undertaken to inform the master plan.

Purpose and scope of this risk assessment

The purpose of this risk assessment is to inform the content of the EMF for the master plan, which:

- Identifies and maps the environmental values within and surrounding the master planned area
- Identifies potential impacts on the Outstanding Universal Value (OUV) and other environmental values of the Great Barrier Reef World Heritage Area (GBRWHA)
- Outlines objectives and priority management measures (PMMs) for managing potential environmental impacts from future development within the master planned area

The scope of this risk assessment includes:

- Mapping the environmental values within each of the draft master planned area precincts (using the Evidence Base Report (AECOM 2016) as a basis, and supplementing with additional relevant information)
- Defining which environmental values contribute to the OUV of the GBRWHA, for environmental values within and surrounding the master planned area
- A risk assessment of potential impacts associated with three growth scenarios for the master planned area on the OUV of the GBRWHA and other environmental values within each draft master planned area precinct and surrounding areas (where relevant)
- Proposed EMF objectives for managing potential impacts within the master plan draft precincts
- Proposed PMMs required to achieve the EMF objectives for managing potential impacts, addressing existing gaps and inconsistencies in regulation and reducing the risk levels (where practical) for activities within the master planned area
- Proposed implementation mechanism for the PMMs (eg planning and/or operational measures) and the entity responsible for implementing the PMMs
- Other matters to be considered in preparing the port overlay



The proposed EMF objectives, PMMs and other port overlay matters have been provided to DSD for consideration.

Growth scenarios and risk assessment

Three growth scenarios were developed by DSD in consultation with Gladstone Ports Corporation (GPC), Gladstone Regional Council (GRC) and other state agencies. The growth scenarios predict the potential growth of port and industry in the master planned area up to year 2050.

For each of the growth scenarios, key assumptions were developed and then further defined into land and marine uses. Definition of these key assumptions into land and marine uses or activities, enabled the identification and risk levels associated with potential impacts to the OUV of the GBRWHA and other environmental values within and surrounding the master planned area.

Existing and potential activities within each of the draft master planned area precincts were assessed to identify activities that have the potential to cause impacts (ie impact sources) on environmental values within the draft precinct and surrounding areas. The risk of these impacts occurring was assessed in the context of the existing management measures (ie statutory, voluntary and operational environmental management measures) within the master planned area.

Through this risk assessment process, activities resulting in high and medium risk impacts were investigated in further detail to determine the specific cause of the risk. This informed the development of proposed PMMs and other port overlay matters, and the recalculation of risk for these activities and their corresponding potential impacts post-PMM and port overlay implementation, as a means of testing their effectiveness.

Proposed environmental management framework objectives

Specific objectives have been developed for each of the draft master planned area precincts to manage the potential impacts on the OUV of the GBRWHA and other environmental values within and surrounding the master planned area. The objectives consider the context of the existing operational port, the nature of the potential future impact, the specific environmental value and the contribution to the overall OUV of the GBRWHA. The objectives have informed the review of the gaps and inconsistencies in the existing statutory requirements and operational environmental management measures, and the subsequent development of PMMs and other port overlay matters.

Proposed priority management measures

As part of the risk assessment, proposed PMMs were developed for the master planned area to:

- Address the gaps in the existing statutory requirements and operational management measures to address potential impacts associated with future developments
- Address inconsistencies in the implementation of existing statutory requirements and operational management measures over the master planning timeframe
- Secure the continuation of non-statutory measures (ie voluntary) over the master planning timeframe

The proposed PMMs were then presented at two stakeholder workshops with representatives from DSD, relevant industry groups and government agencies. These workshops guided and informed the final proposed PMMs and other port overlay matters. Following these workshops, DSD held a series of meetings with relevant stakeholders and government agencies to confirm the content, timing, implementation mechanisms, responsible and advisory entities for the proposed PMMs and other port overlay matters.



This report presents the proposed PMMs, including:

- PMM 1 Amend the Gladstone Regional Council Planning Scheme to change the zoning over Mount Larcom landform area to Environmental Management as part of the next Planning Scheme review process
- PMM 2 Prior to undertaking any operational works within the master planned area, proponents who are not operating in accordance with a cultural heritage management plan approved under the *Aboriginal Cultural Heritage Act 2003*, an Indigenous Land Use Agreement registered under the *Native Title Act 1993*, or an agreement with an Aboriginal Party made in accordance with the *Native Title Act 1993*, will notify the traditional owner representative (of the operational works) as part of implementing the 'cultural heritage duty of care' requirements of the *Aboriginal Cultural Heritage Act 2003*

Note: An approved cultural heritage management plan is a plan that has been approved by the chief executive or the Minister under part 7 of the *Aboriginal Cultural Heritage Act 2003*

- PMM 3 Where necessary to supplement existing environmental value monitoring and technical reporting, undertake surveys within and surrounding the master plan marine precinct to monitor the health of the following values and habitats:

- Seagrass meadows and macroalgae
- Coral reefs
- Marine fauna and their habitat
- Shorebirds and their habitat

Surveys are to be undertaken every five years

Note: This information is to be incorporated into the mapping and information maintained in PMM 4

- PMM 4 To consolidate, manage and update every five years all the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental value information and mapping for the master planned area

- PMM 5 Prepare a Priority Port of Gladstone Environmental Impact Assessment Guideline which shall include the minimum requirements for development applications, for example including:

- Project description and design that address the management hierarchy of avoidance, minimisation and/or mitigation of potential impacts on the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
- Background monitoring and reporting requirements (eg environmental values, scope, timeframe) prior to lodging the application to the regulator
- Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within and surrounding the development area for lodgement to the regulator (ie utilising/building upon the information and mapping associated with PMM 4)
- Indigenous cultural heritage requirements
- Identify and assess the potential impacts and risks to achieving the master plan objectives and other legislation objectives
- Management actions and requirements
- Monitoring and reporting requirements during construction and operation



Note: The guideline is to be addressed during preparation of the terms of reference for an environmental impact statement prepared under the *State Development and Public Works Organisation Act 1971*, *Environmental Protection Act 1994* and/or the *Planning Act 2016*.

- PMM 6 Prepare a Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline which shall include requirements to:
- Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within the environmental protection precinct areas to be managed (with reference to the data and information collected in PMM 4)
 - Define the objectives and management outcomes of the environmental protection precinct area (Land Management Plan objectives should be consistent with the environmental protection precinct environmental management framework objectives within the master plan)
 - Identify the existing and potential threats and potential risks to achieving the environmental protection precinct objectives and management outcomes
 - Identification and management of potential impacts on other environmental values within surrounding areas
 - Management actions and requirements for the management of the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
 - Monitoring and reporting requirements for the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
- PMM 7 Prepare a Land Management Plan for Facing Island in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)
- PMM 8 Prepare a Land Management Plan for the Priority Port of Gladstone Inshore Islands in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)
- PMM 9 Prepare a Land Management Plan for the Mount Larcom Landform in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)
- PMM 10 Prepare a Land Management Plan for Lot 87 on SP144431 in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan (refer PMM 6)

Note: This lot is a Reserve located directly adjacent to the southern cadastral boundary of Lot 1 on SP144430 at 293 Mylrea Road, Aldoga

The proposed PMMs and other port overlay matters have been developed in consideration of the principles of ESD and are designed to allow the operation and future development of the priority Port of Gladstone in a manner that manages potential impacts on the OUV of the GBRWHA and other environmental values within the master planned area and surrounding areas. These proposed PMMs are for DSD to consider in preparing the priority Port of Gladstone master plan and port overlay.

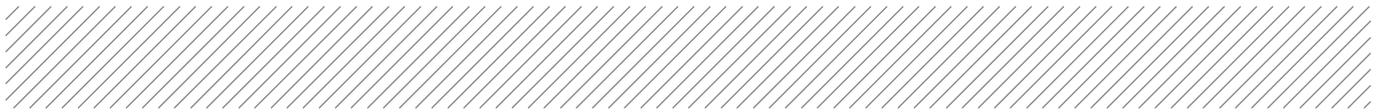


Other port overlay matters

The risk assessment process has also identified other port overlay matters, including:

- A design code which includes measures and other controls to be implemented within the master plan interface precinct and adjacent Strategic Port Land (SPL) within the port, industry and supply chain precinct to ensure compatibility of port and industrial land uses, and residential development
- PMM implementation and approval timeframes to be considered in drafting the port overlay, which may include a prioritisation framework for all PMMs to identify the required order of PMM implementation (ie some PMMs are a precursor to other PMMs)
- A marine precinct code which includes measures and other controls to be implemented within the master plan marine precinct to ensure expansions and new development are appropriate located and operated with due consideration of the OUV of the GBRWHA and other environmental values

A range of other general conclusions were identified as a result of the risk assessment process and are presented in this report for consideration by DSD. These conclusions are expected to assist in achieving effective implementation of the priority Port of Gladstone master plan.



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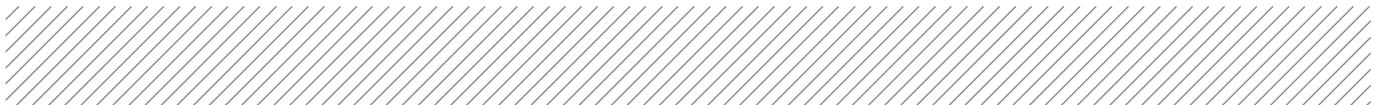
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Environmental value maps

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Modelled potential habitat for selected threatened flora and fauna species



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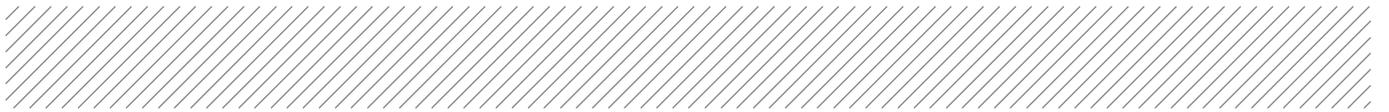
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Acronyms and abbreviations

Acronym/abbreviation	Definition
ACH Act	<i>Aboriginal Cultural Heritage Act 2003</i> (Qld)
AMSA	Australian Maritime Safety Authority
APLNG	Australia Pacific Liquefied Natural Gas
ASS	Acid sulfate soils
Biosecurity Act	<i>Biosecurity Act 2014</i> (Qld)
CHMP	Cultural Heritage Management Plan
CLR	Contaminated Land Register
COAG	Council of Australian Governments
CPM Act	<i>Coastal Protection and Management Act 1995</i> (Qld)
CQRP	Central Queensland Regional Plan
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cwth	Commonwealth
DAF	Department of Agriculture and Fisheries
DATSIP	Department of Aboriginal and Torres Strait Islander Partnerships
DIWA	Directory of Important Wetlands of Australia
DNPSR	Department of National Parks, Sport and Racing
DNRM	Department of Natural Resources and Mines
DSD	Department of State Development
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DSITI	Department of Science, Information Technology and Innovation
EHP	Department of Environment and Heritage Protection
EIS	Environmental impact statement
EMF	Environmental management framework
EMR	Environmental Management Register
EMS	Environmental Management System
EO Act	<i>Environmental Offsets Act 2014</i> (Qld)
EP Act	<i>Environmental Protection Act 1994</i> (Qld)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth)
ERAs	Environmentally Relevant Activities
ERMP	Ecosystem Research and Monitoring Program
ESD	Ecologically sustainable development
Evidence Base Report	Evidence Base Report for Gladstone Port Master Planned Area
EVMP	Environmental value management plan
EVNT	Endangered, vulnerable or near threatened
FHA	Fish Habitat Area
Fisheries Act	<i>Fisheries Act 1994</i> (Qld)

Acronym/abbreviation	Definition
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
GHHP	Gladstone Healthy Harbour Partnership
GLNG	Gladstone Liquefied Natural Gas Project
GPC	Gladstone Ports Corporation
GPC LUP	GPC 2012 Land Use Plan
GRC	Gladstone Regional Council
GSDA	Gladstone State Development Area
GTP	Gas transmission pipeline
ha	hectares
HS Act	<i>Historic Shipwrecks Act 1976 (Cwth)</i>
IAR	Impact Assessment Report
IDAS	Integrated Development Assessment System
IEMS	Integrated Environmental Monitoring System
ILUA	Indigenous Land Use Agreements
LGA	Local government area
LNG	Liquefied natural gas
MNES	Matters of National Environmental Significance
MS Act	<i>Transport Operations (Maritime Safety) Act 1994 (Qld)</i>
MSES	Matters of State Environmental Significance
mtpa	Million tonnes per annum
NC Act	<i>Nature Conservation Act 1992 (Qld)</i>
NC Reg	<i>Nature Conservation (Administration) Regulation 2006 (Qld)</i>
NPS	National Ports Strategy
OUV	Outstanding Universal Value
P&G Act	<i>Petroleum and Gas (Production and Safety) Act 2004 (Qld)</i>
PAR	Photosynthetically Active Radiation
PASS	Potential acid sulfate soils
PCIMP	Port Curtis Integrated Monitoring Program
Planning Act	<i>Planning Act 2016 (Qld)</i>
PMAV	Property Maps of Assessable Vegetation
PMM	Priority management measure
Ports Act	<i>Sustainable Ports Development Act 2015 (Qld)</i>
PP Ships Act	<i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (Cwth)</i>
QCLNG	Queensland Curtis Liquefied Natural Gas Project
QGC	Queensland Gas Company
Qld	Queensland

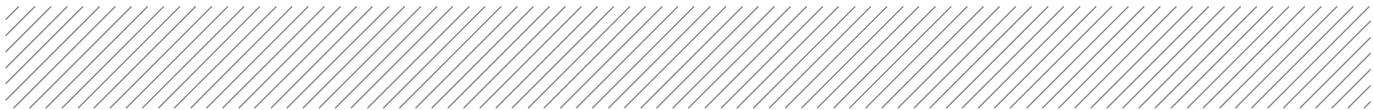


Acronym/abbreviation	Definition
Reef 2050	Reef 2050 Long-Term Sustainability Plan
RIMReP	Reef 2050 Integrated Monitoring and Reporting Program
RPI Act	<i>Regional Planning Interests Act 2014 (Qld)</i>
SBMP	Site Based Management Plan
SD Act	<i>Environment Protection (Sea Dumping) Act 1981 (Cwth)</i>
SDAP	State Development Assessment Provisions
SDPWO Act	<i>State Development and Public Works Organisation Act 1971 (Qld)</i>
SKM	Sinclair Knight Merz
SP Act	<i>Sustainable Planning Act 2009 (Qld)</i>
SPL	Strategic Port Land
TI Act	<i>Transport Infrastructure Act 1994 (Qld)</i>
TOMP Act	<i>Transport Operations (Marine Pollution) Act 1995 (Qld)</i>
VM Act	<i>Vegetation Management Act 1999 (Qld)</i>
Water Act	<i>Water Act 2000 (Qld)</i>
WaTERS	Water Tracking and Electronic Reporting System
WICT	Wiggins Island Coal Terminal

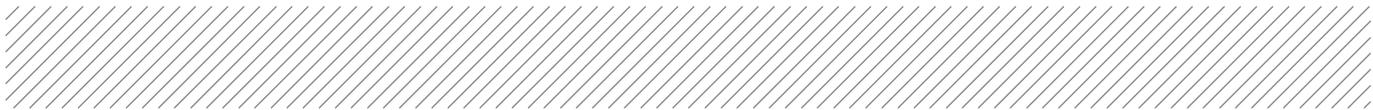
Glossary of terms

Term	Meaning
adaptive capacity	The adaptive capacity of a particular sensitive value (receptor) is defined as the ability or potential to respond to an activity, action or processes (stressors) and change in a manner that reduces vulnerability
adaptive management	A systematic process for continually improving management policies and practices by learning from the outcomes of operational programs
adverse impact	Adverse impact is defined as an impact that results in an unwanted and unanticipated result of taking a particular action.
assessable development	Under the SP Act a development permit is necessary for assessable development and is defined as: <ul style="list-style-type: none"> ■ Generally, assessable development means development prescribed under SP Act Section 232(1)(c) to be assessable development (refer <i>Sustainable Planning Regulation 2009</i>) ■ The term also includes development declared under a State planning regulatory provision to be assessable development ■ For a planning scheme area, the term also includes other development not prescribed under a regulation to be assessable development, but declared to be assessable development under any of the following that applies to the area: <ul style="list-style-type: none"> – the planning scheme for the area – a temporary local planning instrument – a preliminary approval to which SP Act Section 242 applies
benthic	The benthic zone is the region at the lowest level of a body of water, such as an ocean or sea, including the sediment surface and some sub-surface layers. Organisms living in this zone are referred to as benthos or benthic invertebrates
biodiversity	The biological diversity of life is commonly regarded as being made up of the following components: <ul style="list-style-type: none"> ■ Genetic diversity – the variety of genes (or units of heredity) in any population ■ Species diversity – the variety of species ■ Ecosystem diversity – the variety of communities or ecosystems
CAMBA	China-Australia Migratory Bird Agreement. This agreement between the Government of Australia and the Government of the People's Republic of China was developed in 1986 for the protection of migratory birds and their environment
capital dredging	Dredging for navigation, to create new or enlarge existing channel, port, marina and boat harbour areas. Dredging for engineering purposes, to create trenches for pipes, cables, immersed tube tunnels, to remove material unsuitable for foundations and to remove overburden for aggregate
close proximity to the coast	Areas that are situated within 2 km of the boundary of the marine precinct of the master planned area. This term is generally used in this report in reference to potential development within the port, industry and supply chain precinct that contain coastal ecosystems
coastal ecosystems	Inshore, coastal and adjacent catchment ecosystems that connect the land and sea and have the potential to influence the health and resilience of the Great Barrier Reef

Term	Meaning
concurrence agency	Under SP Act a concurrence agency, for a development application is: <ul style="list-style-type: none"> ■ An entity prescribed under a regulation as a concurrence agency for the application, or ■ If the functions of the entity in relation to the application have been devolved or delegated to another entity – the other entity
condition	Refers to existing state, including state of health
connectivity	The extent to which a species or population can move among landscape elements in a mosaic of habitat types
consequence	The outcome of an event which has an effect on objectives. A single event can generate a range of consequences which can have both positive and negative effects on objectives. Initial consequences can also escalate through knock-on effects
conservation significant	A collective term used with reference to species that are listed as critically endangered, endangered, vulnerable or near threatened under the provisions of the <i>Nature Conservation Act 1992</i> (Qld) and/or the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth)
critically endangered	Designated as critically endangered under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth)
development	Under the SP Act development is any of the following: <ul style="list-style-type: none"> ■ carrying out building work ■ carrying out plumbing or drainage work ■ carrying out operational work ■ reconfiguring a lot, or ■ making a material change of use of premises
direct impact	An impact that results from a direct interaction between a Project activity and the sensitive value/receptor
Directory of Important Wetlands in Australia	Nationally important wetlands are listed in the Directory of Important Wetlands in Australia (DIWA). It includes an inventory of wetlands assessed as meeting criteria for national importance.
Ecological adverse impact	Ecological adverse impact means any change in the physical or biological conditions of the natural environment that results in a detrimental effect upon flora, fauna, air, water, minerals or other natural characteristic of the area
ecological community	An assemblage of species occupying a particular area
ecologically sustainable development	Under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> the principles of ecologically sustainable development (ESD) are: <ol style="list-style-type: none"> a) Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations b) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making e) Improved valuation, pricing and incentive mechanisms should be promoted
endangered	Designated as endangered under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth) and/or <i>Nature Conservation Act 1992</i> (Qld)

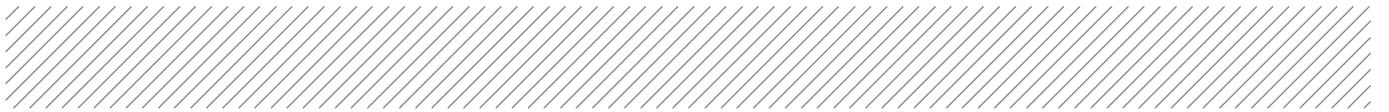


Term	Meaning
<p><i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth) conservation status</p>	<p>Under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth), listed species and ecological communities are assigned a conservation status of extinct in the wild, critically endangered, endangered or vulnerable. Definitions of these terms under the Act are as follows:</p> <p>Extinct in the wild</p> <ul style="list-style-type: none"> ■ It is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range, or ■ It has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a timeframe appropriate to its lifecycle and form <p>Critically endangered</p> <ul style="list-style-type: none"> ■ It is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria <p>Endangered</p> <ul style="list-style-type: none"> ■ It is not critically endangered, and ■ It is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria <p>Vulnerable</p> <ul style="list-style-type: none"> ■ It is not critically endangered or endangered, and ■ It is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria <p>Migratory</p> <ul style="list-style-type: none"> ■ Migratory species are those animals that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations. Examples of migratory species are species of birds (eg albatrosses and petrels), mammals (eg whales) or reptiles. Listed migratory species are those listed in the: <ul style="list-style-type: none"> – Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) – China-Australia Migratory Bird Agreement (CAMBA) – Japan-Australia Migratory Bird Agreement (JAMBA) – Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)
<p>environmental harm</p>	<p>Under the EP Act environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.</p> <p>Environmental harm may be caused by an activity:</p> <ul style="list-style-type: none"> ■ Whether the harm is a direct or indirect result of the activity, or ■ Whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors
<p>environmental value</p>	<p>'Environmental value' is defined under the EP Act and the <i>Sustainable Ports Development Act 2015</i> (Ports Act) as:</p> <ul style="list-style-type: none"> ■ A quality of physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or ■ Another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation <p>For the purpose of this report environmental value also includes cultural heritage, visual amenity and community values.</p>

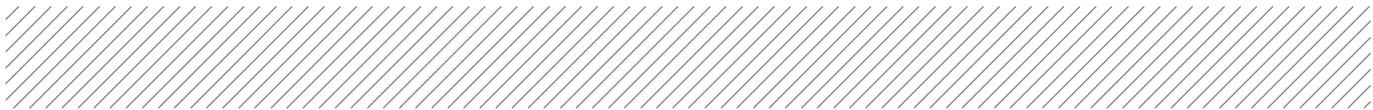


Term	Meaning
environmental value management plan	<p>A management plan that contains management measures and actions that will be implemented during the design, construction and/or operational phases of development. The management measures and actions have a particular focus on the specific environmental values to be directly or indirectly impacted by the development and associated activities.</p> <p>The specific environmental values addressed in the management plan can include, but not limited to:</p> <ul style="list-style-type: none"> ■ Great Barrier Reef Outstanding Universal Value (OUV) attributes within the Gladstone region ■ Matters of national environmental significance (MNES) ■ Matters of state environmental significance (MSES) ■ Other ecological conservation significance flora species, vegetation communities, fauna species and fauna habitat ■ Water quality, including freshwater (surface and groundwater) and marine areas (eg erosion and sediment control plans, acid sulfate soils management plans, contaminated land management plans and remediation, dredging management plans, monitoring programs) ■ Social values ■ Cultural heritage ■ Visual amenity ■ Other environmental values relevant to the development and its spatial coverage and location
exposure	Refers to the exposure of a sensitive value (receptor) to a Project activity, action and/or processes (stressors) that act on that sensitive value. Exposure may be direct or indirect, acute or chronic
Great Barrier Reef Marine Park	The area subject to protection under the <i>Great Barrier Reef Marine Park Act 1975</i> covering 344,400km ² including the subsoil beneath the seabed (1000 m below) and the airspace above (915m high). It is a multiple-use marine park area that supports a range of communities and industries that depend on the Reef for recreation or their livelihoods (including tourism, fishing, boating and shipping). The Great Barrier Reef Marine Park is a matter of national environmental significance and the Great Barrier Reef Marine Park Authority is responsible for its protection and management.
Great Barrier Reef World Heritage Area	<p>The Great Barrier Reef World Heritage Area (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 Marine Park, which is beyond the edge of the continental shelf. The area was declared a World Heritage Area in 1981 because of its 'outstanding universal value'.</p> <p>About 99 per cent of the World Heritage Area is within the Great Barrier Reef Marine Park but encompasses:</p> <ul style="list-style-type: none"> ■ Some 980 islands which are under Queensland jurisdiction ■ Some internal waters or Queensland (for examples, some deep bays, narrow inlets or channels between islands) ■ All waters seaward of the low water mark from near Fraser Island to Cape York
growth scenarios	Growth scenarios for the master planned area developed by the Queensland Government. Refer to Sections 5.1 to 5.3.

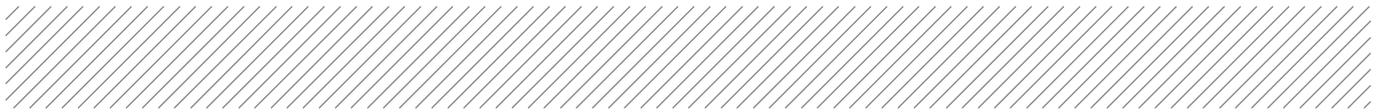
Term	Meaning
habitat	An area or areas permanently, periodically or occasionally occupied by a flora and/or fauna species, population or ecological community, including any and all biotic and abiotic features of the area or areas occupied
Indigenous cultural heritage	Includes all places that are part of Aboriginal and Torres Strait Islander peoples' spiritual links to the land or which tell the story of Indigenous peoples from time immemorial to the present. It can include sacred sites, ceremonial sites like bora rings and rock art, fish traps, burials, middens, scarred trees, camp sites and semi/permanent settlements
indirect impact	An impact that is not a direct result of Project activities but occurs away from the original impact or direct disturbance area via a pathway (eg alterations of conditions that increase the potential for non-native algae to colonise which reduces habitat quality). In accordance with the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth) (EPBC Act), indirect impacts for example, include the following: <ul style="list-style-type: none"> ■ 'Downstream' or 'downwind' impacts, such as impact on wetlands or ocean reefs from sediment, fertilisers or chemical which are washed or discharged into river systems ■ 'Upstream impacts' such as impacts associated with the extraction of raw materials and other inputs which are used to undertake the action ■ 'Facilitated impacts' which result from further actions (including actions by third parties) which are made possible or facilitated by the action
integrity	For World Heritage properties, integrity relates to the 'wholeness and intactness' of the property and how it conveys the values it holds. Integrity can also relate to the size of the property (sufficient size to continue to represent the values) and to any threats affecting the property.
likelihood	The chance that something might happen. Likelihood can be defined, determined, or measured objectively or subjectively and can be expressed either qualitatively or quantitatively
magnitude	The nature and extent of the potential impacts to a value/receptor, including direct and indirect impacts
maintenance dredging	Dredging to ensure that previously dredged channels, berths, swing basins or construction works are maintained at their designated dimensions
management measures	A statutory or non-statutory measure to improve the environmental outcome or minimise the potential environmental impact from development (construction and operational phases)
marine areas	The master planned areas mapped within the draft marine precinct, including marine waters, seabed and associated marine flora and fauna
marine plants	Under the <i>Fisheries Act 1994</i> (Qld), marine plants include: <ul style="list-style-type: none"> ■ A plant (a tidal plant) that usually grows on, or adjacent to, tidal land, whether it is living, dead, standing or fallen ■ (Material of a tidal plant, or other plant material on tidal land ■ A plant, or material of a plant, prescribed under a regulation or management plan to be a marine plant. <p>Marine plants do not include declared pest species under the <i>Biosecurity Act 2014</i> (Qld).</p>
master planned area	The proposed boundary for the priority Port of Gladstone master planned area



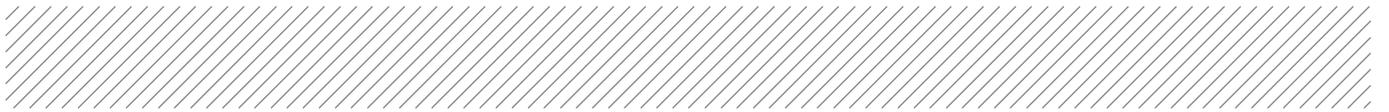
Term	Meaning
material change of use	<p>Under the SP Act material change of use means:</p> <ul style="list-style-type: none">■ The start of a new use of the premises; or■ The re-establishment on the premises of a use that has been abandoned; or■ A material increase in the intensity or scale of the use of the premises. <p>The <i>Planning Act 2016</i> (Qld) (Planning Act) will replace the SP Act in 2017.</p>
MNES	<p>Under the EPBC Act the MNES include:</p> <ul style="list-style-type: none">■ World Heritage properties■ National Heritage properties■ Wetlands of international importance (listed under the Ramsar Convention)■ Nationally threatened species and ecological communities■ Migratory species (protected under international agreements)■ Commonwealth marine areas■ The Great Barrier Reef Marine Park■ Nuclear actions (including uranium mines)■ A water resources, in relation to coal seam gas development and large coal mining development■ The environment, where actions proposed are on, or will affect Commonwealth land and the environment■ The environment, where Commonwealth agencies are proposing to take an action



Term	Meaning
MSES	<p>Under the <i>Environmental Offset Regulation 2014</i> (Qld), Schedule 2 defines MSES as:</p> <ul style="list-style-type: none"> <li>■ Regulated vegetation (clause 2) <li>■ Connectivity areas (clause 3) <li>■ Wetlands and watercourses (clause 4) <li>■ Designated precinct in a strategic environmental area (clause 5) <li>■ Protected wildlife habitat (clause 6) <li>■ Protected areas (clause 7) <li>■ Highly protected zones of State marine parks (clause 8) <li>■ Fish habitat areas (clause 9) <li>■ Waterway providing for fish passage (clause 10) <li>■ Marine plants (clause 11) <li>■ Legally secured offset areas (clause 12) <p>The Queensland State Planning Policy (April 2016) also defines MSES as including the following natural values and areas:</p> <ul style="list-style-type: none"> <li>■ Protected areas (including all classes of protected area except coordinated conservation areas) under the <i>Nature Conservation Act 1992</i> (Qld) (NC Act) <li>■ Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the <i>Marine Parks Act 2004</i> (Qld) <li>■ Areas within declared fish habitat areas that are management A areas or management B areas under the <i>Fisheries Regulation 2008</i> <li>■ Threatened wildlife under the NC Act and special least concern animal under the <i>Nature Conservation (Wildlife) Regulation 2006</i> (Qld) (NC Reg) <li>■ Regulated vegetation under the <i>Vegetation Management Act 1999</i> (Qld) (VM Act) that is: <ul style="list-style-type: none"> <li>– Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems <li>– Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems <li>– Category R areas on the regulated vegetation management map <li>– Areas of essential habitat on the essential habitat map for wildlife prescribed as 'endangered wildlife' or 'vulnerable wildlife' under the NC Act <li>– Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse map <li>– Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map <li>■ A designated precinct, in a strategic environmental area under the <i>Regional Planning Interests Regulation 2014</i>, schedule 2, s15(3) <li>■ Wetlands in a wetland protection area or wetlands of high ecological significance shown on the Map of Referable Wetlands under the <i>Environmental Protection Regulation 2008</i> <li>■ Wetlands and watercourses in high ecological value waters as defined in the Environmental Protection (Water) Policy 2009, schedule 2 <li>■ Legally secured offset areas.



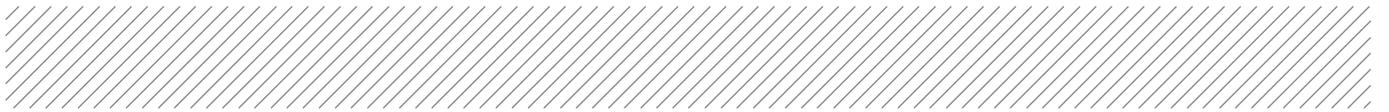
Term	Meaning
<p><i>Nature Conservation Act 1992 (Qld) conservation status</i></p>	<p>Under the NC Act, protected species are assigned a conservation status of extinct in the wild, endangered, vulnerable, near threatened, or least concern. Definitions of these terms under the NC Act are as follows:</p> <p>Extinct in the wild</p> <ul style="list-style-type: none"> ■ There have been thorough searches conducted for the wildlife, and ■ It has not been seen in the wild over a period that is appropriate for the lifecycle or form of the wildlife <p>Endangered</p> <ul style="list-style-type: none"> ■ There have not been thorough searches conducted for the wildlife and the wildlife has not been seen in the wild over a period that is appropriate for the lifecycle or form of the wildlife, or ■ The habitat or distribution of the wildlife has been reduced to an extent that the wildlife may be in danger of extinction, or ■ The population size of the wildlife has declined, or is likely to decline, to an extent that the wildlife may be in danger of extinction, or ■ The survival of the wildlife in the wild is unlikely if a threatening process continues <p>Vulnerable</p> <ul style="list-style-type: none"> ■ Its population is decreasing because of threatening processes, or ■ Its population has been seriously depleted and its protection is not secured, or ■ Its population, while abundant, is at risk because of threatening processes, or ■ Its population is low or localised or depends on limited habitat that is at risk because of threatening processes <p>Near threatened</p> <ul style="list-style-type: none"> ■ The population size or distribution of the wildlife is small and may become smaller, or ■ The population size of the wildlife has declined, or is likely to decline, at a rate higher than the usual rate for population changes for the wildlife, or ■ The survival of the wildlife in the wild is affected to an extent that the wildlife is in danger of becoming vulnerable <p>Least concern</p> <ul style="list-style-type: none"> ■ The wildlife is common or abundant and is likely to survive in the wild ■ Native wildlife may be prescribed as least concern wildlife even if: <ul style="list-style-type: none"> – The wildlife is the subject of a threatening process, or – The population size or distribution of the wildlife has declined, or – There is insufficient information about the wildlife to conclude whether the wildlife is common or abundant or likely to survive in the wild
<p>non-coastal areas</p>	<p>Areas that are situated more than 2 km from the marine precinct of the master planned area and do not contain coastal ecosystems</p>



Term	Meaning
offsets	<p>An environmental offset involves compensating for impacts on the environment or biodiversity at one site through activities at another site. At the Commonwealth level, offsets are defined as measures that compensate for the significant residual adverse impacts of an action on the environment. The Commonwealth and Queensland governments require that all reasonable steps should first be taken to avoid and then mitigate adverse impacts on the environment both considering environmental offsets.</p>
operational works	<p>Under the SP Act operational works means:</p> <ul style="list-style-type: none"> (a) extracting gravel, rock, sand or soil from the place where it occurs naturally; or (b) conducting a forest practice; or (c) excavating or filling that materially affects premises or their use; or (d) placing an advertising device on premises; or (e) undertaking work in, on, over or under premises that materially affects premises or their use; or (f) clearing vegetation, including vegetation to which the Vegetation Management Act applies; or (g) undertaking operations of any kind and all things constructed or installed that allow taking or interfering with water, other than using a water truck to pump water, under the <i>Water Act 2000</i>; or (h) undertaking— <ul style="list-style-type: none"> (i) tidal works; or (ii) work in a coastal management district; or (i) constructing or raising waterway barrier works; or (j) performing work in a declared fish habitat area; or (k) removing, destroying or damaging a marine plant; or (l) undertaking roadworks on a local government road. <p>Operational work does not include—</p> <ul style="list-style-type: none"> (a) for item 1(a) to (f) and (j), any element of work that is— <ul style="list-style-type: none"> (i) building work; or (ii) drainage work; or (iii) plumbing work; or (b) clearing vegetation on— <ul style="list-style-type: none"> (i) a forest reserve under the <i>Nature Conservation Act 1992</i>; or (ii) a protected area under the <i>Nature Conservation Act 1992</i>, section 28; or (iii) an area declared as a State forest or timber reserve under the <i>Forestry Act 1959</i>; or (iv) a forest entitlement area under the <i>Land Act 1994</i>.
other environmental values	<p>Includes environmental values that do not contribute to the Outstanding Universal Value (OUV) of the GBRWHA</p>



Term	Meaning
Outstanding Universal Value	<p>The Great Barrier Reef was inscribed on the World Heritage List in 1981 in recognition of its OUV. The World Heritage Committee listed the Great Barrier Reef for the following natural criteria:</p> <ul style="list-style-type: none"> ■ Criterion (vii) – contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance ■ Criterion (viii) – 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 (ix) – 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 (x) – 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.
OUV of the GBRWHA	This term is used throughout this report and refers to environmental values within the master planned area and surrounds that contribute to the OUV of the GBRWHA
planning instrument	As defined under the <i>Sustainable Planning Act 2009</i> , a State planning regulatory provision, a designated region's regional plan, a State planning policy, the standard planning scheme provisions, a planning scheme, a temporary local planning instrument or a planning scheme policy
Port Curtis	The marine waters of the priority Port of Gladstone master planned area
prescribed environmental matters	Includes MNES (excluding nuclear actions; the environment, where actions proposed are on, or will affect Commonwealth land and the environment; and the environment, where Commonwealth agencies are proposing to take an action) and MSES. Also includes matters of local environmental significance as defined under the <i>Environmental Offsets Regulation 2014</i> , Section 5(4).
Ramsar Convention	The Ramsar Convention, also known as the Convention on Wetlands of International Importance, is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources
receptor	A receptor is a sensitive value. Receptors may be subject to impacts as a result of stressors
referral agency	A referral agency is an advice agency or a concurrence agency
residual impact	A residual impact is defined as an impact that remains direct and/or indirect following the implementation of mitigation measures
residual significant adverse impact	A residual significant adverse impact is the impact which has been deemed to be 'significant' as defined by the 'Matters of National Environmental Significance – Significant Impact Guidelines Version 1.1' (DoE 2013), which remain after avoidance and mitigation measures have been implemented
resilience	Ability of a value/receptor to return to existing condition or state following exposure to a project activity, action or processes (stressors)
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement. This agreement between the Government of Australia and the Government of the Republic of Korea was developed in 2006 for the protection of migratory birds



Term	Meaning
self-assessable development	<ul style="list-style-type: none">■ Generally, self-assessable development means development prescribed under a regulation for SP Act Section 232(1) to be self-assessable development.■ The term also includes development declared under a State planning regulatory provision to be self-assessable development.■ For a planning scheme area, the term also includes other development not prescribed under a regulation to be self-assessable development, but declared to be self-assessable development under any of the following that applies to the area:<ul style="list-style-type: none">– The planning scheme for the area;– A temporary local planning instrument;– A preliminary approval to which SP Act Section 242 applies.
significant impact	In accordance with the <i>Environment Protection and Biodiversity Conservation Act 1999</i> , a significant impact is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts
terrestrial areas	All areas within the draft port industry supply chain, marine industry and recreation, interface, and environmental protection precincts. This includes surface water and groundwater within these precincts (where not mapped within the draft marine precinct)
vulnerability	In relation to a value/receptor, is the potential for, or susceptibility to, harm from a project activity, action and/or process (stressor). It is the degree to which a sensitive value and/or system (receptor) is sensitive to pressures and disturbances (stressors).



1 Introduction

1.1 Background

At a national level, there are a number of documents that inform the direction of priority port master planning in Queensland, including the National Ports Strategy (2011) (NPS) and the Reef 2050 Long-Term Sustainability Plan (Reef 2050). The NPS was endorsed by the Council of Australian Governments in 2012, to address the need for collaborative planning of future development of Australia's port and freight infrastructure (DSD 2016).

Reef 2050 was released by the Commonwealth and Queensland governments in 2015. Reef 2050 provides a comprehensive plan to secure the health and resilience of the Great Barrier Reef and to protect the Outstanding Universal Value (OUV) of the Great Barrier Reef World Heritage Area (GBRWHA) (DSD 2016).

Master planning for priority ports is one of the port-related actions of the Reef 2050, and is mandated under the *Sustainable Ports Development Act 2015* (Qld) (Ports Act). Priority port master planning has a timeframe up to 2050 to align with the Reef 2050. The master planning process requires the consideration of a range of issues and interests beyond the limits of Strategic Port Land (SPL), including marine and land-based potential impacts; port and supply chain capacity and connectivity; and social, economic and environmental interests (DSD 2016).

The overarching purpose of master planning for Queensland's priority ports is to:

- Define a long term strategic vision and associated strategic objectives for the master planned area
- Articulate the state interests in relation to the priority ports and how these interests will be considered in all planning decisions made regarding the master planned area
- Present an environmental management framework (EMF) for the master planned area that reflects the principles of ecologically sustainable development (ESD)

Priority port master planning delivers certainty for priority ports and associated industries within a sustainable development framework, to protect and manage the OUV of the Great Barrier Reef and the social and economic interests of Queensland's major ports (DSD 2016).

The Port of Gladstone is located within the GBRWHA and is Queensland's largest multi-cargo port and the fifth largest coal export terminal in the world (by throughput). The port is located within a diverse region containing a range of urban communities, major industrial precincts and environmental values of international importance. There is significant opportunity for continued growth in the import and export of a range of commodities to Australia and the world, with the Port of Gladstone playing a pivotal role in the future growth of the national port trade.



Under the Ports Act, the Port of Gladstone is defined as one of four priority ports in Queensland (along with Port of Abbot Point, Ports of Hay Point and Mackay, and Port of Townsville), requiring a port master plan to ensure sustainable development of the port into the future.

The master planning process for the priority Port of Gladstone is being led by the Department of State Development (DSD). Once finalised, the priority Port of Gladstone master plan (the master plan) will be implemented through the port overlay. The port overlay will state how priority management measures (PMMs) are to be achieved and the responsible entity for implementing the PMMs (DSD 2016).

Figure 1.1 shows the location of the proposed boundary for the priority Port of Gladstone master planned area (the master planned area) and draft precincts.

The master planned area covers approximately 73,000 hectares (ha). The master planned area comprises land where development is regulated and managed under a number of statutory instruments, including:

- Gladstone State Development Area (GSDA) (approximately 27,000 ha) where land use is regulated by the Coordinator-General via the GSDA Development Scheme 2015
- SPL (approximately 4,300 ha) where development is regulated by GPC via the GPC 2012 Land Use Plan (Version 2, February 2016) (GPC LUP)
- Gladstone Regional Council (GRC) areas (approximately 7,210 ha of land) where land use is regulated by GRC via the GRC Planning Scheme 2015
- Other statutory requirements and operational environmental management process (refer Section 4)

The master planned area includes approximately 38,600 ha of marine and intertidal areas that are located within the GBRWHA. Whilst there are some statutory/operational requirements that apply to these areas, there is currently no planning instrument.

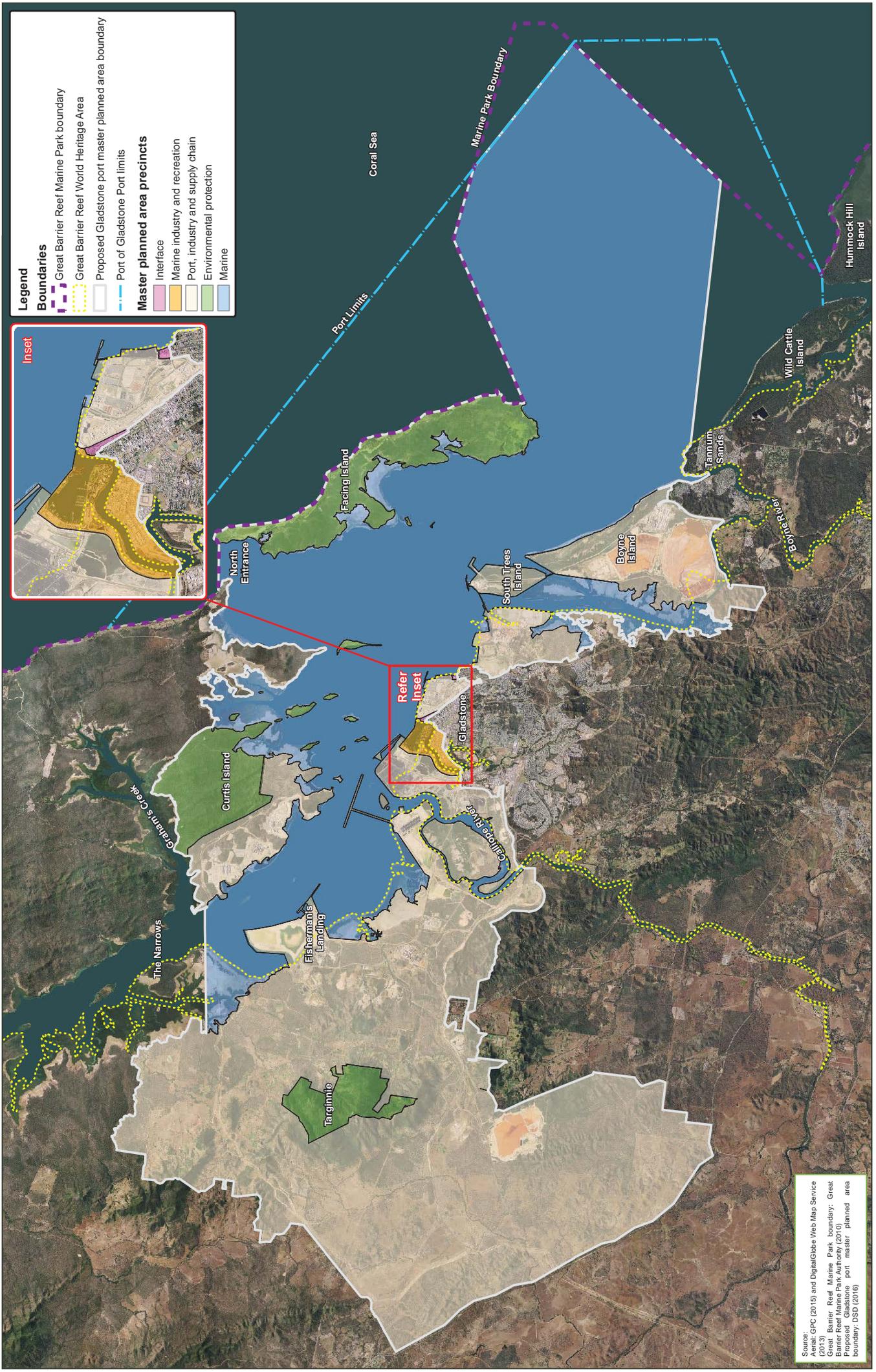
1.2 Purpose and scope

The purpose of this risk assessment is to inform the content of the EMF for the master plan. Figure 1.2 outlines the components of the EMF process being undertaken for the master planning process. The master planning process also included an *Infrastructure and Supply Chain Requirements Assessment* which was undertaken concurrently with this risk assessment by PSA Consulting Australia. The infrastructure assessment identified additional infrastructure items that have been included in the activity and the causes of the potential impacts on environmental values assessed in the risk assessment.

The *Evidence Base Report for the Gladstone Port Master Planned Area* (Evidence Base Report) (AECOM 2016) has been used as the basis for identifying environmental values (ie natural environment, community and cultural heritage values) within the master planned area, and has been utilised to inform the risk assessment of growth scenarios within the master planned area. The Independent Review of the Port of Gladstone (DSEWPaC 2013) has been utilised to define the OUV attributes within the GBRWHA that are expressed in the master planned area and surrounding areas.

The EMF will form part of the master plan and include:

- Identifying and mapping environmental values within the master planned area and surrounding areas
- Potential impacts on the OUV of the GBRWHA and other environmental values as a result of future development within the master planned area
- Objectives and PMMs for managing potential impacts from future development within the master planned area



Source: Aerial, GPC (2015) and DigitalGlobe Web Map Service (2013)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Gladstone port master planned area boundary, DSD (2016)



Figure 1.1: Proposed boundary for the priority Port of Gladstone master planned area and draft precincts

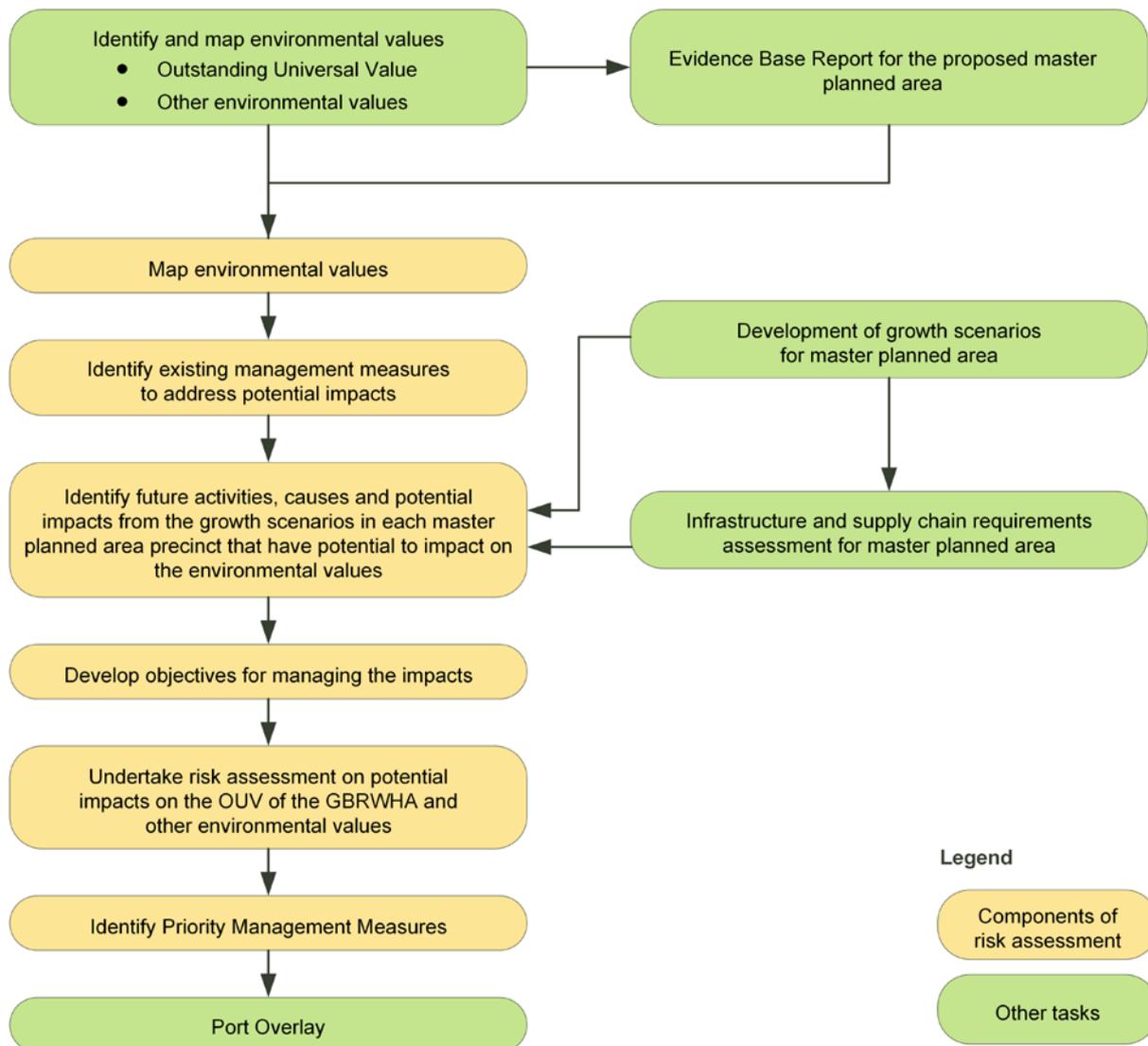


Figure 1.2 Environmental management framework process undertaken to inform priority port master planning

The scope of this risk management assessment includes:

- Mapping the environmental values within each of the draft precincts, and providing justification for any environmental values that are not able to be mapped
- Defining which environmental values contribute to the OUV of the GBRWHA, using the attributes identified in the Evidence Base Report for the values within and surrounding the master planned area
- A risk assessment of the potential impacts from three growth scenarios within the master planned area on the OUV of the GBRWHA and other environmental values within each master planned area precinct and surrounding areas (where relevant). The risk assessment steps have included:
 - Identifying the existing and potential activities and associated potential impacts to the environmental values based on cause/s (eg potential impacts may be the result of construction and/or operational phases of activities)

- 
- Determining the risk of each potential impact, with the implementation of existing statutory requirements and operational environmental management measures, on the OUV of the GBRWHA and other environmental values based on likelihood and consequence
 - Proposing objectives for managing each of the potential impacts
 - Proposing the PMMs required to achieve the objectives for managing potential impacts and reducing the risk rating (where practical). PMMs can include measures that are:
 - Not currently regulated
 - Not regulated consistently or effectively across the whole master planned area
 - Not currently proposed to be implemented for the full master planning timeframe
 - Identifying the post-PMM risk of each potential impact on the environmental value
 - Proposing the implementation mechanism (eg planning and/or operational measures) and the entity responsible for implementing the PMMs

The output of this risk assessment is a list of proposed PMMs for the master planned area and associated conclusions relating to issues identified in the risk assessment. The PMMs and conclusions will be considered in the preparation of the master plan and port overlay for the master planned area in accordance with the Ports Act.



2 Methodology

2.1 Mapping of environmental, social and cultural heritage values

The Evidence Base Report prepared by AECOM (2016) identifies the environmental values within the master planned area, including natural environmental values, social and cultural heritage values (herein referred to collectively as 'environmental values').

The Evidence Base Report has been utilised as the primary basis for identifying and mapping environmental values within the master planned area, and determining the contribution of those values towards the OUV of the GBRWHA (as published in the *Independent Review of the Port of Gladstone* (DSEWPac 2013)).

Table 2.1 defines the environmental values within the master planned area and the corresponding sections within the Evidence Base Report for each environmental value (where relevant). This table also identifies supplementary datasets and reports which have been used to map the environmental values within the master planned area, as presented in Appendices A and B of this report.

The environmental values maps provided in Appendices A and B have been developed utilising existing datasets. While some of these datasets have been synthesised using field collected data, it is acknowledged that some of the datasets are the result of desktop studies (ie not all mapping has been confirmed through field survey). Table 2.1 describes the limitations of the datasets and mapping is provided in Appendices A and B.

Table 2.1 Environmental value and information sources utilised for mapping environmental values within the master planned area and surrounding areas

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Threatened flora species	7.4.1.1	Herbreds data	Queensland Herbarium (2016)	Figure A.1	<p>The Evidence Base Report provides results from a desktop 'likelihood of occurrence' assessment for threatened flora species within the master planned area. The assessment identifies 18 threatened flora species as known or possibly occurring within the master planned area. MSES mapping was utilised to show 'high risk' areas for threatened flora species (ie Figure 13 of the Evidence Base Report), however the report recognises that there is a gap in relation to site specific survey information within the master planned area for threatened flora species.</p> <p>In this report, Figure A.1 provides confirmed field records for threatened flora species listed under the NC Act (and in some cases also the EPBC Act). This Herbreds data is available from the Queensland Herbarium and is the best data available at the time this risk assessment was undertaken. Although the best available information has been utilised for this mapping, the Herbreds data clearly states the following limitations of the dataset:</p> <ul style="list-style-type: none"> ■ Some records are not provided as they are considered 'sensitive or commercially targeted species' and therefore not provided to the public in order to protect populations of these species ■ Low precision of some geographic coordinates (eg historical records being included in the Herbreds database) ■ Status is provided for listings under the NC Act only and does not indicate EPBC Act status.
		Protected plant survey 'high risk' trigger areas	EHP (2015)		
		Modelled potential habitat for selected threatened species in Queensland	DSITI (2015)		



Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
				All maps are provided in Appendix A unless otherwise stated	<p>Figure A.1 also includes areas identified as 'high risk' areas that may trigger a protected plant survey under the provisions of the NC Act if vegetation clearing is to be undertaken. This information has been developed through a desktop assessment, using location of known records and including a defined buffer area around the point. This mapping does not map confirmed habitat, however it identifies areas where threatened flora species may occur.</p> <p>Appendix B, Figures B.1 to B.66, are predicted habitat maps developed by DSITI. The areas of predicted habitat are produced from a desktop methodology and have not been confirmed via field surveys. The maps also do not account for areas of existing disturbance (eg previously cleared areas).</p> <p>The predicted habitat dataset presents data for a comprehensive suite of flora and fauna species known or likely to occur in Queensland. It is anticipated that additional habitat models will be developed over time and included within the dataset. It is acknowledged that the maps in Appendix B do not represent a complete list of threatened flora and fauna species known or likely to occur within the master planned area.</p>

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Threatened ecological communities	7.4.1.2	Regional Ecosystem data (version 8.0)	DNRM (2016)	Figure A.2 All maps are provided in Appendix A unless otherwise stated	<p>The Evidence Base Report provides a list and associated map of five TECs that are potentially significant environmental values within the master planned area (refer Table 10 and Figure 14 of the Evidence Base Report).</p> <p>This report utilised the REs listed in the Evidence Base Report to map the five TECs in Figure A.2.</p> <p>The existing RE dataset available from DNRM is based on field confirmation of vegetation types across the State and the subsequent interpretation of aerial photography to produce a state wide map. The extent of remnant vegetation is mapped based on Landsat imagery (ie satellite imagery). Therefore the positional accuracy of the mapped vegetation is to be used as a guide, and in some cases, the vegetation community may not be as mapped on the regulated vegetation map. The RE dataset is regularly updated by DNRM with mapping amendments submitted following field verifications and as new Landsat imagery becomes available.</p>
Endangered and Of concern Regional Ecosystems	7.4.1.3	Regional Ecosystem data (version 8.0)	DNRM (2016)	Figure A.3	<p>The Evidence Base Report provides a table and map of REs within the master planned area based on the existing RE dataset (refer to Table 11 and Figure 14).</p> <p>This report maps REs as listed under the <i>Vegetation Management Act 1999</i> (VM Act) as Endangered and Of concern (ie threatened) in Figure A.3, and the Least concern REs under the VM Act are mapped in Figure A.4.</p> <p>The limitations of the RE dataset are as outlined above for the TECs.</p>
		<i>Mangrove and Saltmarsh Monitoring: Literature Review</i>	SKM (2013)		
Least concern Regional Ecosystems	7.4.1.3	Regional Ecosystem data (version 8.0)	DNRM (2016)	Figure A.4	

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Mangroves	7.5.1.1	Regional Ecosystem data (version 8.0)	DNRM (2016)	Figure A.5 All maps are provided in Appendix A unless otherwise stated	The Evidence Base Report identifies five REs that contain mangrove species (refer Table 17). This report utilised the RE data to map these mangrove communities in Figure A.5 . The limitations of the RE dataset are outlined above for the TECs, and apply to this mangrove mapping also. Though it is anticipated that this mapping covers a significant proportion of the mangroves within the master planned area, it may not include the total extent of mangroves (eg mangroves that do not form part of a remnant community may not be mapped in the RE dataset). It is considered that project-specific impact assessments would provide additional mapping of non-remnant mangrove communities (ie those not currently identified in the RE data).
Seagrass meadows	7.5.1.1	Gladstone Permanent Transect Seagrass Monitoring – December 2013 Updated Report	Bryant & Rasheed (2013)	Figure A.6	The Evidence Base Report presents a map of the November 2013 seagrass meadow distribution within the master planned area and surrounds (refer to Plate 2 of the Evidence Base Report), noting that seagrass meadows are dynamic and susceptible to local conditions. Figure A.6 in this report provides a combined historical recorded extent of seagrass meadows within the master planned area based on survey results between 2002 and 2014 (compiled sources listed in this table). This mapping represents that recorded extent of seagrass meadows over a 12 year period to account for seasonal variability, and includes areas that may contain seagrass seed stores and potentially regenerative capacity.
		Seagrass in Port Curtis and Rodds Bay 2014: Annual long-term monitoring, biannual Western Basin, and updated baseline survey Port Curtis, Rodds Bay and Channel Duplication Seagrass and Light Monitoring: January 2013 to May 2015	Carter et al. (2015) Davies et al. (2015)		

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Coral reefs	7.5.1.1	Long term seagrass monitoring in the Port Curtis Western Basin: Quarterly seagrass assessments and permanent transect monitoring progress report November 2009 – November 2012	McCormack et al. (2013)	All maps are provided in Appendix A unless otherwise stated	The Evidence Base Report describes a number of known reefs within the master planned area and refers to mapping in BMT WBM (2014). This report presents the 2015 extent of coral reefs within the master planned area and surrounds in Figure A.7 . The reef extents shown in this report are based on combined field survey data from Vision Environment (2015) and BMT WBM (2014). GBRMPA (2009b) 'indicative reef boundaries' are also included in Figure A.7. Though this layer (compared to more data based on field survey), it has been included as it correlates with the GBR Gazetteer names and reef numbers for the reefs within the GBRWHA.
		Contrasting recovery of shallow and deep water seagrass communities following climate associated losses in tropical north Queensland, Australia	Rasheed et al. (2014)		
		Changes in Benthic Communities on Fringing Coral Reefs around Facing Island: August 2013	Ayling et al. (2013)		
		Identification of coral reef sites for Restoration and Enhancement – Phase 1	BMT WBM (2014)		
		Central Queensland Corals and Associated Benthos: Monitoring Review and Gap Analysis	BMT WBM (2013)		



Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
		Gladstone Coral Desktop Study: <i>Distribution and Ecological Value of Corals and Coral Reef in the Gladstone and Wider Bioregion</i>	DHI (2013)	All maps are provided in Appendix A unless otherwise stated	
		Indicative Reef Boundaries (version 4)	GBRMPA (2009b)		
		<i>Prioritisation of reef restoration and enhancement sites – Phase 2 and 3 Report</i>	Jones et al. (2015)		
		<i>Mapping and Assessment of Seagrass and Coral Reefs for the Gladstone Ports Corporation Limited</i>	Oceania Maritime Consultants Pty Ltd (2011)		
		<i>Port of Gladstone Gatcombe and Golding Cutting Channel Duplication Project Environmental Impact Statement, Reef and Nekton Baseline Data Collection, August 2015</i>	Vision Environment (2015)		

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Benthic macroalgae and macroinvertebrates	7.5.1.1, 7.5.2 and 7.5.2.2	Baseline assessment of benthic communities (algae and macro-invertebrates) in the Port Curtis Region November 2013	McKenna et al. (2014)	Figure A.8	The Evidence Base Report provides a general description of the diversity and distribution of macroalgae and macroinvertebrate communities within the master planned area. Figure A.8 in this report provides mapping based on field surveys from the sources listed in this table, showing both the extent and density of macroalgae and macroinvertebrate communities in the master planned area. It is noted that these surveys assessed subtidal areas within the Port of Gladstone, and therefore do not provide mapping within shallow or intertidal areas.
		Port Curtis and Rodds Bay seagrass and benthic macro-invertebrate community baseline survey, November/December 2002	Rasheed et al. (2003)		
Fish and fisheries	7.5.2.1 and 7.5.2.2	QFish dataset for Commercial Fishing Logbooks between the years 2005 -2014	DAF (2015b)	Figure A.9	The Evidence Base Report describes the values of the Port Curtis region in terms of fish species richness and abundance, and refers to a proposed fish habitat area (FHA) in the Calliope River. This report provides mapping in Figure A.9 for FHAs currently regulated under the provisions of the <i>Fisheries Act 1994</i> : FHAs and waterways where activities may impact on fish movements. There are no FHAs within the master planned area, however and number of high, medium and low risk waterways are identified in terms of potential impacts to fish movement and fish communities associated with waterway barrier works. This mapping is designed to be confirmed during field assessment for any works that may potentially trigger the requirements to obtain a waterway barrier works permit under the provisions of the <i>Fisheries Act 1994</i> . Figure A.9 also shows the extent of the proposed Calliope River FHA, which is outside and directly adjacent to the master planned area. Further information on the values of this FHA are outlined in the <i>Fisheries Resources of Calliope River, Gladstone</i> report (DNSPR 2014).
		Gladstone Recreational Fishing Project Gladfish 2014 Nov 2013-Oct 2014. Assessing Trends in Recreational Fishing in Gladstone Harbour and Adjacent Waterways	Sawynok et al. (2014)		

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
		Fish habitat areas	DNPSR (2015)	All maps are provided in Appendix A unless otherwise stated	
		<i>Fisheries Resources of Calliope River, Gladstone</i>	DNPSR (2014)		
Marine megafauna	7.5.2 and 7.5.2.3	<i>Review of Coastal Dolphins in central Queensland, particularly Port Curtis and Port Alma regions</i>	Cagnazzi (2013)	Figure A.10	The Evidence Base Report identifies marine megafauna species likely to occur within the master planned area and surrounds, however no mapping for these species was provided. Figure A.10 of this report maps the Rodds Bay Dugong Protection Area, which is regulated under the <i>Fisheries Act 1994</i> . The Rodds Bay Dugong Protection Area covers a large proportion of the master plan marine precinct, however there are some mapping inconsistencies where the mapping extends into the master plan terrestrial precincts (eg Fisherman's Landing, Boyne Island, RG Tanna Coal Terminal). Figure A.10 also shows relative dugong density based on aerial surveys conducted from 1986 to 2005 (Sobtzick et al. 2013). This GIS layer was created using a model covering the whole of the southern GBR (using 2 x 2 km ² grid squares), and is therefore not designed to map dugong density within the master planned area. This mapping indicates relative dugong density (ie where there are more, or less, dugongs), and not absolute dugong density. There is limited available mapping for marine megafauna distribution, density and/or critical habitats for the master planned area.
		<i>Increase understanding of the status of the Australian snubfin and Australian humpback dolphins within Port Curtis and Port Alma</i>	Cagnazzi (2015)		
		Dugong protection areas	DAF (2015a)		
		<i>Report for Marine Megafauna and Acoustic Survey, Autumn and Summer Surveys</i>	GHD (2011)		
		<i>Technical Report, Gladstone Harbour Report Card 2015</i>	Thompson et al. (2015)		
		<i>Project 2: Dugong distribution and abundance on the urban coast of Queensland: a basis for management</i>	Marsh & Lawler (2007)		

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
		<p><i>Status of the Dugong population in the Gladstone area</i></p> <p><i>Improving the time series of estimates of dugong abundance and distribution by incorporating revised availability bias corrections,</i></p>	<p>Sobtzick et al. (2013)</p> <p>Sobtzick et al. (2015)</p>	All maps are provided in Appendix A unless otherwise stated	
Marine turtles and other marine reptiles	7.5.2	<p><i>Health Surveillance of Stranded Green Turtles in Southern Queensland, Australia (2006-2009)</i></p> <p><i>EHP Threatened Species Unit Turtle Conservation Project: Curtis Island and Woongarra Coast Flatback Turtles, 2013-2014 breeding season</i></p> <p><i>Curtis Island Marine Turtle Monitoring 2011-2012 breeding season</i></p> <p><i>EHP Threatened Species Unit Turtle Conservation Project: Curtis Island and Woongarra Coast Flatback Turtles, 2014-2015 breeding season</i></p>	<p>Flint et al. (2010)</p> <p>Limpus et al. (2014)</p> <p>Limpus et al. (2012)</p> <p>Limpus et al. (2015)</p>	Figure A.11	<p>The Evidence Base Report identifies marine turtles and a freshwater turtle either known or likely to occur within the master planned area and surrounds, however no mapping is provided (refer to section in this table relating to 'Threatened and endangered terrestrial, aquatic and intertidal fauna habitat' for further information on best available information).</p> <p>This report maps turtle nesting beaches within the master planned area and surrounds in Figure A.11. Nesting by a number of species of marine turtles has been recorded at these beaches, as reported in the references provided within this table.</p> <p>There is no currently available mapping identifying habitat areas for other marine reptiles within the master planned area and surrounds. There is however information available for sightings of other marine reptiles and descriptions of known or likely habitat areas.</p>

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Shorebirds, migratory birds and seabirds		<i>QCLNG Environmental Impact Statement Volume 5: Environmental Impacts of Shipping Operations & Ancillary Infrastructure</i>	QGC (2009)	All maps are provided in Appendix A unless otherwise stated	<p>The Evidence Base Report outlines the results of a desktop 'likelihood of occurrence' assessment for migratory bird species (refer Table 14 of the Evidence Base Report). The assessment identifies 45 migratory birds as known to occur and seven species as potentially occurring within the master planned area. The results of shorebird monitoring within the master planned area and surrounds are described within the Evidence Base Report, however there is no mapping of habitat for migratory species.</p> <p>This report maps shorebird habitat (ie habitat for both migratory and non-migratory shorebird species) in Figure A.12, however this mapping requires review and potential confirmation through project-specific field surveys. Figure A.12 also identifies a number of important shorebird roost sites within the master planned area. These sites have been identified based on the number of shorebirds observed at these sites during shorebird monitoring undertaken in Port Curtis. There may also be other important roosting sites within the master planned area that were not assessed as part of the ongoing shorebird monitoring in Port Curtis.</p> <p>There is no currently available mapping of habitat or potential habitat for migratory seabirds, woodland, or freshwater wetland migrants within the master planned area.</p>
	7.4.2 and 7.5.2	Shorebird and Count Area Maps	Birdlife Australia (2015)		
	<i>Arrow LNG Plant Supplementary Report to the EIS Addendum – Final Shorebird Technical Study</i>	Ecosure (2013)	Figure A.12		
	<i>Report for Migratory Shorebird Monitoring Port Curtis to Port Alma Survey 3</i>	GPC (2012)			
	<i>Migratory Shorebird Monitoring Review</i>	IMEMS Pty Ltd (2013)			
	GLNG LNG Facility Curtis Island – Shorebird Surveys	URS (2015)			
	Report for Migratory Shorebird Monitoring Port Curtis and the Curtis Coast Annual Summer Survey – 2013 to 2015	Wildlife Unlimited Pty Ltd (2013, 2014, 2015)			

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Threatened and endangered terrestrial, aquatic and intertidal fauna habitat	7.4.2 and Figure 14	Regional Ecosystem data – Essential habitat (version 8.0)	DNRM (2016)	Figures A.13 and A.14	The Evidence Base Report provides results from a desktop 'likelihood of occurrence' assessment for threatened fauna species within the master planned area (refer Tables 13 and 15 of the Evidence Base Report). The Evidence Base Report identifies a gap in the species-specific mapping and survey data for the master planned area in relation to these threatened fauna species. Figures A.13 and A.14 of this report map the currently available Essential Habitat (referred to as 'Wildlife habitat' in Figure A.14) for threatened flora and fauna species. These datasets are produced using known records for threatened species and then buffering the records and/or creating mapped areas of likely habitat (ie largely a desktop approach). Furthermore, the layers do not detail what species the areas are habitat for, and so are useful tools for identifying potentially sensitive areas, but are not of use to show potential habitat for a particular species. Appendix B, Figures B.1 to B.66 , are predicted habitat maps developed by DSITI and include mapped areas of predicted habitat for threatened fauna species within the master planned area. The areas of predicted habitat are produced from a desktop methodology and have not been confirmed via field surveys. They also do not account for areas of existing disturbance (eg previously cleared areas). Furthermore, this dataset does not provide a complete set of predicted habitat maps for all threatened fauna species known or likely to occur within the master planned area. It is anticipated additional habitat models will be developed over time and included in the dataset.
		Matters of State Environmental Significance (version 4.1)	EHP (2016a)		
Water quality	7.5.3, 7.6.4 and 7.6.5 Plate 3	Modelled potential habitat for selected threatened species in Queensland	DSITI (2015)		Due to the spatial and temporal variability in marine and freshwater water quality within the master planned area, it was determined that a static map or figure would not be required for assessing potential impacts as part of this risk assessment process. The information provided within the Evidence Base Report will assist in determining water quality values within the master planned area precincts.

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Wetlands	7.6.1 and Figure 17	Queensland Wetlands Dataset	EHP (2016c)	Figure A.14 to A.16 All maps are provided in Appendix A unless otherwise stated	<p>The Evidence Base Report includes mapping for wetlands of high ecological significance in Figure 13 and shows the extent of the Queensland wetlands mapping (EHP 2016c) within the master planned area in Figure 17. This information is presented in this report in Figures A.14 and A.15.</p> <p>The Queensland wetlands dataset is based on a range of remotely sensed data (eg RE data, water body data) and limited ground-truthing. Although the dataset development methodology includes a quality control review by an expert panel, the mapping is designed to be used as a planning tool requiring field confirmation surveys as appropriate (EPA 2005).</p> <p>Figure A.16 maps wetlands registered on the Directory of Important Wetlands in Australia (DIWA) present within the master planned area (ie Port Curtis and The Narrows). DIWA is a combination of mapping of nationally important and the inclusion of important knowledge relating to each wetland in an online register. The mapping is broad-scale and defines regions as opposed to individual wetland systems/communities and provides value as a planning and management decision tool.</p> <p>No Ramsar wetlands were identified as occurring within the master planned area.</p>
		Queensland Map of Referable Wetlands, Version 1.1	EHP (2014)		
		Directory of Important Wetlands in Australia	DoE (2015b)		
		<i>Port Curtis and Port Alma Coastal Habitat Archive and Monitoring Program 2015 Annual Report CA14000114: Monitoring the survival and recovery of shorelines, specifically Tidal Wetlands (Mangroves/Saltmarsh/Saltpans)</i>	Duke & Mackenzie (2015)		

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Watercourses	7.6.3	Queensland waterways for waterway barrier works	DAF (2013)	Figure A.9 All maps are provided in Appendix A unless otherwise stated	<p>Figure 18 of the Evidence Base Report maps the major waterways in the master planned area (ie Boyne and Callopie Rivers) and provides a general description of the associated catchment areas (eg land use, current pressures).</p> <p>This report instead utilises waterways mapping regulated under the provisions of the <i>Fisheries Act 1994</i> to show waterways within the master planned area in Figure A.9. This figure shows each waterway and an associated risk level and potential for impacts on fish communities and fish passage in the event that a waterway barrier is required as part of an activity/development. This mapping is designed to be used in conjunction with the guidelines and self-assessable codes for waterway barrier works and is regulated under the <i>Fisheries Act 1994</i>.</p> <p>This mapping was specifically developed for the assessment and management of waterway barrier works and does therefore not provide information on values within each watercourse (other than fish movement potential), however these values are broadly described within the Evidence Base Report. Furthermore, this mapping is based on remotely sensed data and limited field verification and requires field confirmation to determine if waterway barrier permits are required for an activity.</p>
Protected Areas	Figure 13	Protected Areas of Queensland dataset	DNPSR (2016)	Figures A.17 to A.20	<p>The Evidence Base Report includes mapping of National Parks in Figure 13. This report provides mapping of all protected areas regulated under the NC Act, including National Parks and Regional Parks, as shown in Figure A.17. This figure also identifies the locations of State forests which are protected and managed under the provisions of the <i>Forestry Act 1959</i>.</p>
		Biodiversity Planning Assessment – Areas of Biodiversity significance and Fauna corridors	EHP (2007)		

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
		Great Barrier Reef coast marine park zoning	DNSPR (2009)	All maps are provided in Appendix A unless otherwise stated	<p>Figure A.18 on this report presents the Biodiversity Planning Assessment mapping results for the master planned area and surrounds. This mapping does not specifically identify areas protected under current legislation, however it identifies areas of potential conservation value as potential habitat for threatened species or as a fauna movement corridor (ie at local, regional and state levels). This mapping was developed via a desktop assessment, utilising existing remotely sensed data and knowledge from an expert panel. The mapping has been developed to enable assessment of biodiversity values at a landscape scale (EHP 2014).</p> <p>Figures A.19 and A.20 identify Commonwealth and State Marine Park Areas and zones that are directly adjacent to the master planned area. These areas are managed under the overarching <i>Great Barrier Reef Marine Park Act 1975</i>, which establishes responsibilities and functions for the management of the Marine Park.</p>
Acid sulfate soils	7.4.4.1	Atlas of Australian Acid Sulfate Soils dataset	CSIRO (2011)	Figure A.21	<p>The Evidence Based Report describes the presence of acid sulfate soil (ASS) in the tidal sediments of the master planned area.</p> <p>Figure A.21 of this report utilises the national ASS mapping layer to identify potential risk areas for ASS within the master planned area and surrounds. This mapping is based on remotely sensed data (1:100,000 topography maps) with ground-truthing undertaken at a density of 1 site per square kilometre, as outlined in the metadata associated with the dataset.</p>

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Pest and weeds	7.4.1.4 and 7.4.3	High Risk Restricted Fire Ant Areas	DAF (2014)	Figure A.22	<p>The Evidence Base Report provides tables (Tables 12 and 16) listing the potential flora and faunal weed and pest species with potential to occur within the master planned area.</p> <p>There is currently no publicly available mapping dataset to map confirmed pest and weed records within the master planned area.</p> <p>Figure A.22 shows Fire Ant Restricted Areas within the master planned area and surrounds (ie Curtis Island and the Yarwun area). These areas identify 'risk areas' where commercial operators are required to have management plans or approval to move restricted items off a property as regulated under the provisions of the <i>Plant Protection Act 1989</i>.</p>
Indigenous cultural heritage	9	<i>Cultural Heritage Survey and Anthropological Assessment Gladstone Port Channel Duplication, Gladstone Queensland</i>	ARCHAEO Cultural Heritage Services (2015)	Figures A.23 to A.25	<p>Figure 29 of the Evidence Base Report maps the location of Indigenous cultural heritage items as listed on the State government database.</p> <p>This data is shown in Figure A.23 of this report. The dataset available from DATSIP is all known Indigenous cultural heritage sites.</p> <p>Figure A.24 shows Native title claims accepted for registration within the master planned area (Port Curtis Coral Coast Claim QC2001/029), and Figure A.25 shows the coverage of the master planned area for which there are existing Indigenous land use agreements (ILUAs) registered under the <i>Native Title Act 1993</i>, which binds the relevant parties to terms about land use and management of the agreement area.</p>
		Cultural Heritage Locations dataset	DATSIP (2013)		
		Native Title Determination Areas	DNRM (2013)		
		Indigenous land use agreements	DNRM (2016)		
		Traditional Use of Marine Resources Agreement	Port Curtis Coral Coast (2011)		

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Non Indigenous cultural heritage	9	Queensland Heritage Register Gladstone Regional Council Local Heritage Register	EHP (2016b) GRC (2015b)	Figures A.26 and A.27 All maps are provided in Appendix A unless otherwise stated	<p>Figure 30 of the Evidence Base Report identifies registered non Indigenous heritage locations listed on the State government heritage register.</p> <p>This report includes mapping for World, Commonwealth and National Heritage places and shipwrecks older than 75 years (ie protected under the Commonwealth <i>Historic Shipwrecks Act 1976</i>) within the master planned area in Figure A.26. The shipwreck locations provided are based on available geographic information and descriptions, some of which is historical and therefore it may not have been possible for an exact location to be included within the dataset. State Heritage and local heritage locations are mapped in Figure A.27, which aligns with Figure 30 of the Evidence Base Report.</p> <p>It is noted that these figures map known areas of non Indigenous cultural heritage, and there is potential for additional sites/areas to be present within the master planned area.</p> <p>The Evidence Base Report maps social and community infrastructure in Figure 28. This infrastructure is shown in Figure A.28 of this report, and utilises the Evidence Base Report dataset.</p>
Social and community infrastructure	8.3.7 and Figure 28	Gladstone Regional Council Planning Scheme Zoning Layers	GRC (2016)	Figure A.28	

Environmental value	Evidence Base Report section reference	Supplementary information used to map environmental value		Environmental value map	Description and limitations of mapping provided in this report and relationship to the Evidence Base Report
		Report/dataset title	Reference		
Recreational opportunities and natural amenity	8.3.8	Gladstone Regional Council Planning Scheme Zoning Layers	GRC (2015a)	Figure A.29	<p>The Evidence Base Report generally describes the recreational opportunities and natural amenity values within the master planned area, however no mapping is provided. There is no one dataset or mapping layer currently available that identifies these values within the master planned area.</p> <p>In Figure A.29 of this report, a combination of the GRC Planning Scheme layers was utilised to map areas relating to these values. This included conservation areas, tourism areas, open space, and sports and recreational facilities. It is noted that there are expected to be other aquatic areas that are important in terms of recreational opportunities and natural amenity, however these were not mapped within the GRC Planning Scheme. Additional assessments would be required to comprehensively map out areas relevant to these values.</p>
Air quality	7.7.3				Due to the variability in air quality and external influencing factors (eg topography, wind, temperature, turbulence) it was determined that a static map of air quality values would not be required for assessing potential impacts for the purposes of this risk assessment. The Evidence Base Report will be utilised to determine the existing air quality values within the Gladstone region.

2.2 Definition of growth scenarios and potential impacts

2.2.1 Definition of the growth scenarios

For each of the three growth scenarios, key assumptions have been developed into land and marine uses that have nature, scale and spatial aspects (where potential development locations are known) to allow potential impacts to be identified and assessed.

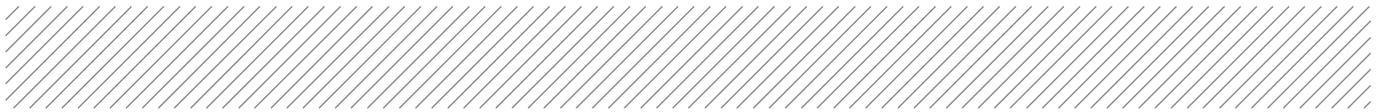
Table 2.2 provides the three growth scenarios and key assumptions for potential land and marine uses.

Table 2.2 Key assumptions for growth scenarios and corresponding land and maritime uses

Growth scenario assumptions	Nature, scale and spatial aspects of land and marine uses
Scenario 1	
<ul style="list-style-type: none"> ■ There is very limited economic growth globally, as well as limited growth across the State and the Gladstone region ■ Growth is within capacity of existing facilities ■ There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions ■ There is no expansion of coal terminal capacity ■ There is minimal new industrial development ■ There is limited project-related capital dredging undertaken at the Port of Gladstone ■ Price of coal remains weak (recognising there is uncertainty about the future of coal) ■ The main shipping channel is not duplicated ■ Continuation of cruise shipping ■ Maximum port throughput of 151 mtpa 	<ul style="list-style-type: none"> ■ Clearing of remnant vegetation and removal of marine communities is within existing approvals ■ Limited capital dredging is beneficially reused in existing reclamation areas ■ Normal maintenance dredging and placement at existing East Banks DMPA ■ Existing anchorage area utilised ■ Minimal new industrial development within port, industry and supply chain precinct, marine industry and recreation precinct, and marine precinct ■ Operational maintenance and/or operational efficiency works for existing port and industrial industries ■ Annual commercial vessel movements within the port to accommodate the maximum port throughput for this scenario ■ Small scale recreational and/or tourism based development within the environmental protection precinct



Growth scenario assumptions	Nature, scale and spatial aspects of land and marine uses
Scenario 2	
<ul style="list-style-type: none"> ■ There is global economic growth, as well as growth across the State and the Gladstone region ■ There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions ■ Potential for technological change to enable ongoing thermal coal demand due to lower emissions ■ Strong price growth for relevant commodities ■ New major industries would be developed within the master planned area ■ Limited duplication of the port's shipping channel and associated dredge material placement ■ Capital dredged material from the Gatcombe and Golding channel duplication, Targinnie Channel and the Clinton Bypass is beneficially reused or placed onshore ■ Continuation of cruise shipping ■ Maximum port throughput of 230 mtpa 	<ul style="list-style-type: none"> ■ Additional clearing of remnant vegetation and removal of marine communities to occur predominantly within the port, industry and supply chain precinct, marine industry and recreation precinct, and marine precinct ■ Capital dredging within the marine precinct ■ Beneficial reuse of dredged material within the marine precinct, and port, industry and supply chain precinct ■ Increase in ship movements within port and GBRWHA. Annual commercial vessel movements within the port to accommodate the maximum port throughput for this scenario ■ Maintenance dredging and placement at existing East Banks DMPA ■ Existing anchorage area utilised ■ Increase in construction environmental impacts (eg erosion, sedimentation, waste, dust, noise, vibration, light) within the port, industry and supply chain precinct, marine industry and recreation precinct, and marine precinct ■ Increase in operational noise, light and air quality impacts from new major industries and expanded terminal operations within the port, industry and supply chain and interface precincts ■ Additional licenced discharges into Port Curtis ■ Small scale recreation and/or tourism based development within the environmental protection precinct ■ Residential density maintained or increased in the interface precinct and other residential areas adjoining the marine industry and recreation precinct, and port, industry and supply chain precinct ■ Additional infrastructure (eg rail, roads) to support the increase in the maximum port throughput



Growth scenario assumptions	Nature, scale and spatial aspects of land and marine uses
Scenario 3	
<ul style="list-style-type: none"> ■ There is significant global economic growth, as well as growth across the State and the Gladstone region ■ There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions ■ Potential for technological change to enable ongoing thermal coal demand due to lower emissions ■ Growth of coal exports supported by development of the Surat Basin linked to the Port of Gladstone by the Surat Basin Railway ■ New major industries developed within the master planned area ■ Significant development at Fisherman's Landing expansion and Hamilton Point ■ Additional major infrastructure including road and rail connection from Curtis Island to mainland instead of additional dredging ■ Strong price growth for relevant commodities ■ Duplication of shipping channels and associated dredge material placement ■ Capital dredged material from the Gatcombe and Golding channel duplication, Targinnie Channel and the Clinton Bypass is beneficially reused or placed onshore ■ Continuation of cruise shipping ■ Maximum port throughput of 294 mtpa 	<ul style="list-style-type: none"> ■ Additional clearing of remnant vegetation and removal of marine communities to occur predominantly within the port, industry and supply chain precinct, marine industry and recreation precinct, and marine precinct ■ Capital dredging within the marine precinct ■ Beneficial reuse of dredged material within the marine precinct, and port, industry and supply chain precinct ■ Increase in ship movements within port and GBRWHA. Annual commercial vessel movements within the port to accommodate the maximum port throughput for this scenario ■ Maintenance dredging and associated placement areas ■ Existing anchorage area utilised ■ Increase in construction environmental impacts (eg erosion, sedimentation, waste, dust, noise, vibration, light) within the port, industry and supply chain precinct, marine industry and recreation precinct, and marine precinct ■ Increase in operational noise, light and air quality impacts from new major industries and expanded terminal operations within the port, industry and supply chain and interface precincts ■ Additional licenced discharges into Port Curtis ■ Small scale recreational and/or tourism based development within the environmental protection precinct ■ Residential density increased in the interface precinct and other residential areas adjoining the marine industry and recreation precinct, and port, industry and supply chain precinct ■ Additional infrastructure (eg rail, roads) to support the increase in the maximum port throughput as identified in the infrastructure and supply chain requirements assessment ■ Direct disturbance and impacts from road and rail connection from mainland to Curtis Island

2.2.2 Defining potential impacts

For the purposes of this risk assessment, 'environmental impact' has been defined in accordance with the Australian Standard HB203:2006, Environmental Risk Management – Principles and Process as any change to the environment, whether adverse or beneficial, wholly or partly resulting from activities, products or services.



The potential impacts on the OUV of the GBRWHA and other environmental values have been defined based on the potential developments and activities likely to result from three growth scenarios developed by DSD in collaboration with state agencies, GPC and GRC for the purposes of the master planning process (refer Sections 5.1 to 5.3).

For these growth scenarios, a range of activities and causes were identified from the assumptions, implications and proposed throughputs specified for the scenarios. Activities and causes have been listed for each of the draft precincts (refer Figure 1.1) to assist in the development of the potential impacts on the OUV of the GBRWHA and other environmental values known or likely to occur within or surrounding the master planned area.

The assessment of potential sources of impact considers all phases of an activity, including:

- Construction of new and/or expansion of industries, facilities and infrastructure, including all supporting infrastructure/supply chains, including capital dredging of shipping channels
- Operation of industries and infrastructure, including all supporting infrastructure
- Maintenance of industries, facilities and infrastructure, including maintenance dredging of shipping channels

Following the definition of the future potential activities and causes within the precincts, the OUV and other environmental values were reviewed with respect to the sensitivity or vulnerability of the value (eg as a receptor) and the potential for impacts as a result of each cause (eg as a driver or stressor).

Several key existing reports were considered in the definition of potential impacts from within the master planned area on the OUV of the GBRWHA and other environmental values within and surrounding the area, including:

- Statement of the OUV in GBRWHA (Lucas et al. 1997)
- *Great Barrier Reef Region Strategic Assessment Program Report* (GBRMPA 2014)
- *Environmental Best Practice Port Development: An Analysis of International Approaches* (GHD 2013)
- Evidence Base Report (AECOM 2016)

In relation to the methodology and content of this report, it is important to note the following:

- The potential impacts have been developed at a high level for the purpose of the master planning process due to the large spatial extent of the master planned area and the wide range of activities that could potentially occur within the precincts up to the year 2050. Where the location of a potential development activity is unknown, the potential impact of the development on the OUV of the GBRWHA and other environmental values assumes the highest conservational significance of the value that occurs within or surrounding the master planned area.
- Potential impacts relate to the activities and causes within the precinct and can include impacts within and adjoining the precinct depending on the location of the activity present (eg activities located in close proximity to a precinct boundary will have indirect impacts on the adjoining precinct and/or surround area)
- Some development activities will occur within two precincts, particularly in the intertidal zone where marine based infrastructure and new or expanded reclamation areas connect to the terrestrial areas of the mainland or islands. The potential impacts and risk assessment for the development activity are included in the relevant precinct where that activity occurs.
- Potential development activities within the master planned area will be subject to environmental impact assessment and Government approval processes which will ensure that the site specific potential impacts of the future development will be appropriately assessed and managed. Section 4 provides a summary of the existing statutory and operational management measures that will potentially apply to possible future developments within the master planned area.

- 
- The potential impacts that form part of the risk assessment only address activities which have the potential to occur within the master planned area, other developments outside of the master planned area (eg urban growth) that may be associated with the growth scenarios do not form part of the risk assessment

2.3 Environmental management framework objectives for managing the potential impacts

Specific EMF objectives have been developed for each of the master planned area precincts to manage the potential impacts on the OUV of the GBRWHA and other environmental values within and surrounding the master planned area. The EMF objectives consider the context of the port, the nature of the impact, the specific environmental value and the contribution to the overall OUV of the GBRWHA. The EMF objectives have informed the review of the gaps and inconsistencies in the existing statutory requirements and operational environmental management measures, and the subsequent development of PMMs.

2.4 Risk assessment methodology

The risk assessment has considered the potential for development (under the three scenarios) to impact the OUV of the GBRWHA and other environmental values within and surrounding the master planned area.

The predicted risk level has been determined based on the likelihood and consequence for the potential impact on the OUV of the GBRWHA and other environmental values, and professional judgement has been utilised to determine the appropriate category for each of the components of the risk assessment process.

Figure 2.1 shows the risk assessment process which has been implemented for this study.

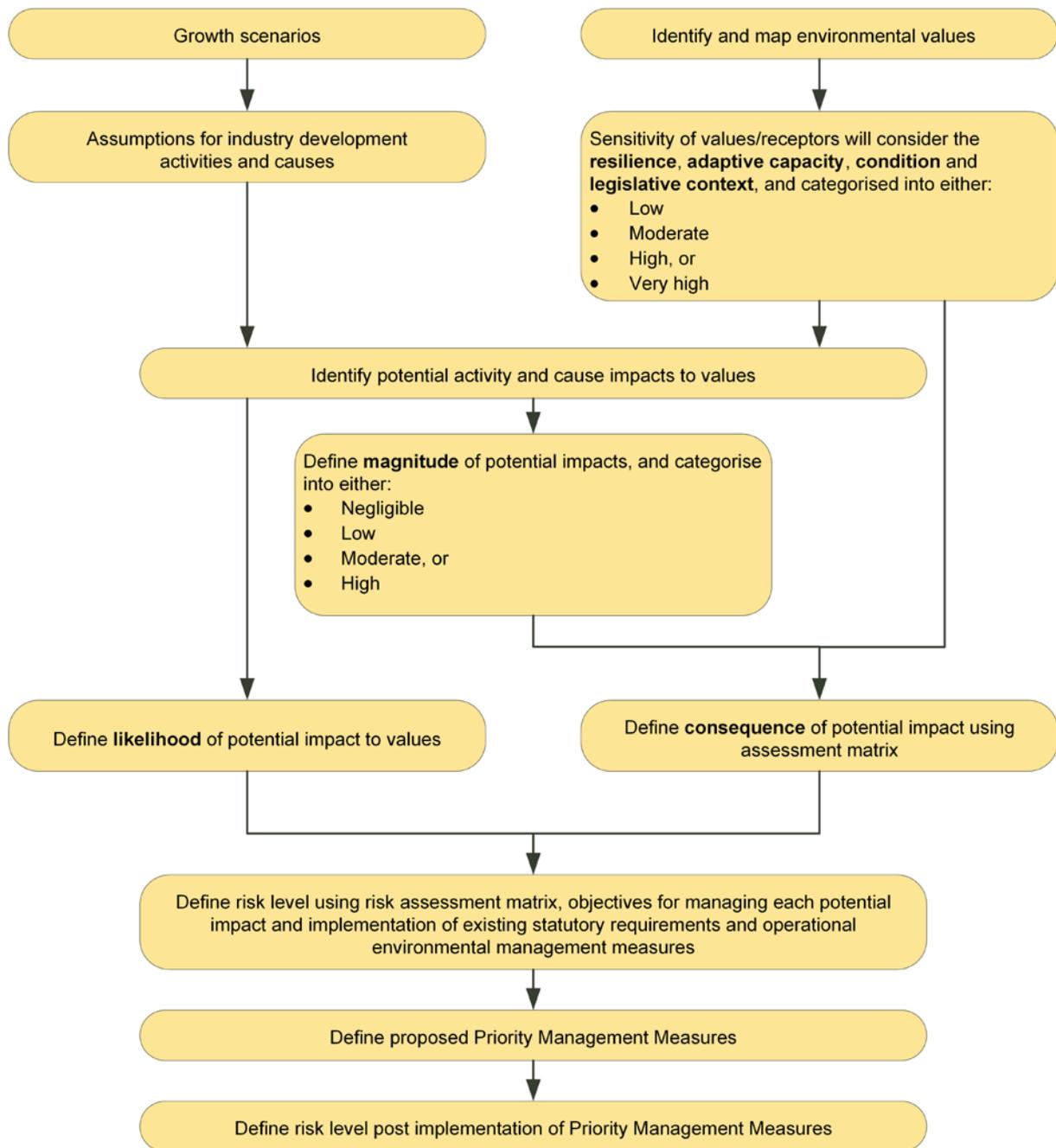


Figure 2.1 Risk assessment methodology flow chart



2.4.1 Likelihood assessment

Table 2.3 provides the likelihood definitions implemented during the risk assessment process.

Table 2.3 Likelihood guide

Likelihood	Definition
Almost certain	Is expected to occur as a result of the particular scenario being assessed
Likely	Will probably occur as a result of the scenario being assessed
Possible	Might occur at some time under the particular scenario being assessed
Unlikely	Unlikely to happen under the particular scenario being assessed
Rare	May occur only in exceptional circumstances

2.4.2 Consequence assessment

The consequence rating has been determined based on the predicted magnitude of impacts and the sensitivity of the OUV of the GBRWHA and other environmental values.

2.4.2.1 Magnitude of impacts

The magnitude of a potential impact is essential to the determination of its level of consequence on environmental values. For the purposes of this risk assessment, impact magnitude has been defined as being comprised of the nature, extent and timeframe/duration of the potential impacts, including direct and indirect impacts. The impact magnitude is divided into five categories (refer Figure 2.2). The magnitude of impacts has been determined considering the implementation of the existing statutory requirements and operational environmental management measures that facilitate an estimation of the **scale, range/spatial extent** and **duration** of the impacts. These terms are further defined in Table 2.4 and Table 2.5.

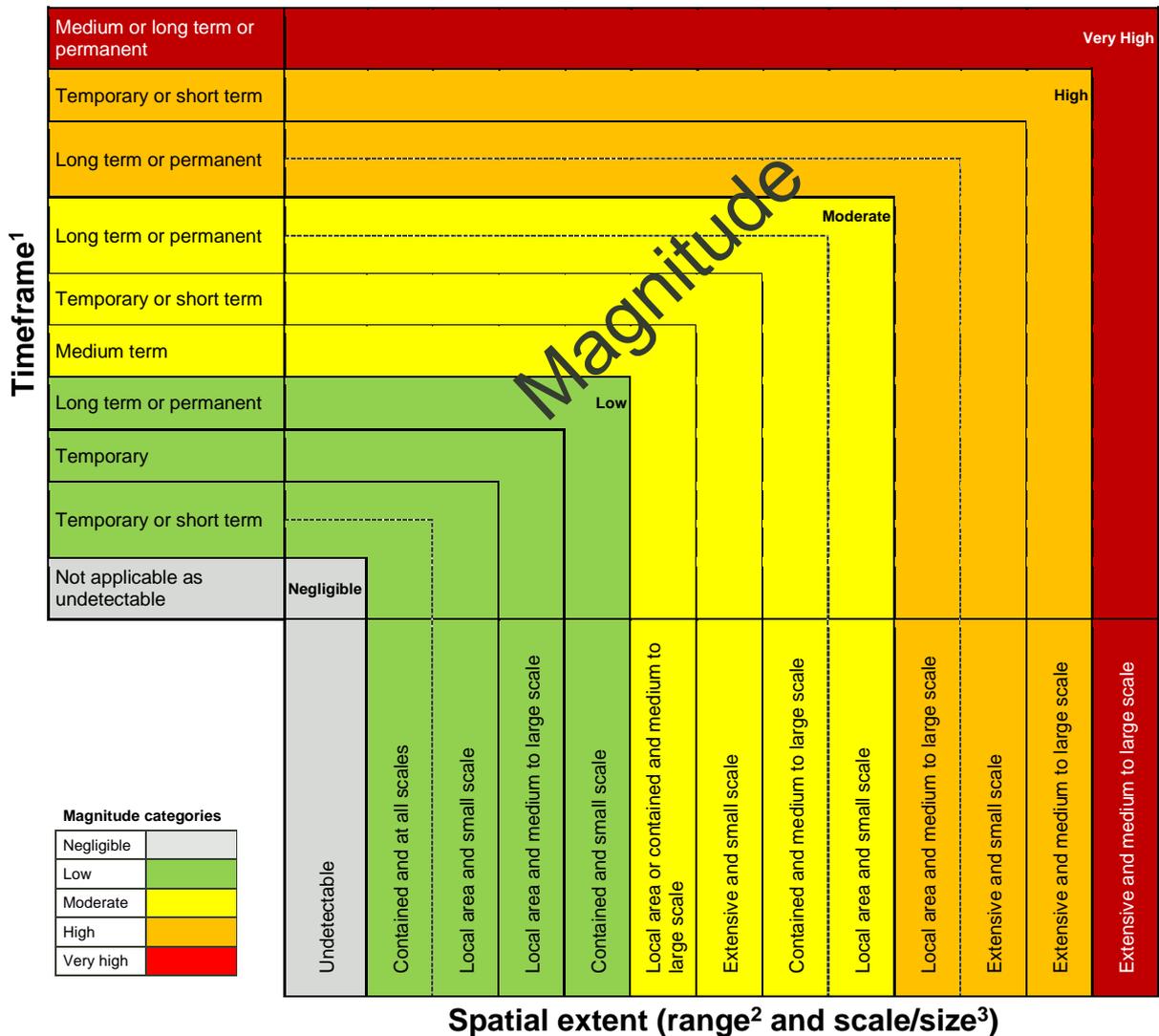


Figure 2.2 Magnitude matrix

Figure notes:

Magnitude of impact information is only used in assessing the level of consequence (defined in Table 2.7 and Table 2.8) for the potential impact associated with the activity in relation to environmental values.

- 1 Timeframe – temporary to permanent
- 2 Range – contained to extensive (refer Table 2.5)
- 2 Scale – small, medium or large scale (refer Table 2.5)

Table 2.4 Estimated timeframes for duration terms

Estimated duration term	Timeframe
Temporary	Days to months (eg 3 to 6 months or 1 season (wet/dry))
Short term	Up to 1 year (ie 6 to 12 months or up to two seasons (wet/dry))
Medium term	From 12 months to 4 years
Long term/long lasting	From 5 to 9 years
Permanent or irreversible	In excess of 10 years or a generational change

Table 2.5 Range or spatial extent criteria for potential impacts

Estimated spatial extent	Impacts occurring within the marine areas	Impacts occurring within the terrestrial areas
Range of the potential impacts		
Undetectable	Not detectable within marine waters	Not noticeable or detected within any area
Contained	Contained within the waters of the direct area of the activity	Contained within the direct area of the activity up to 100 m
Local area	Detectable within the waters of the direct area of the activity as well as in adjoining waters	Outside of the direct area of the activity between 100 m and 2 km
Extensive	Uncontained and potentially far reaching to surrounding waters (eg outside of the master planned area, and significantly extends into the Great Barrier Reef Marine Park, Rodds Bay, upper part of The Narrows, and/or seaward side of Facing and Curtis Islands)	Outside of the direct area and beyond 2 km from the area of the activity
Scale of the growth scenario activity being undertaken (and potential impacts)		
Small scale	The activity is being undertaken at a single location and the footprint of the activity will be small (eg small recreational facilities, such as a visitor centre, and boardwalks)	
Medium scale	The activity is being undertaken at either one site, where the footprint of the activity is a moderate size (eg construction of a new facility, such as a new steel plant); or the activity is being undertaken at multiple sites, however the footprint of the activity at each site is considered minor (eg minor expansions associated with existing facilities)	
Large scale	The activity is being undertaken in one or more locations and the activity footprint is moderate to large in size (eg construction of multiple new facilities)	

2.4.2.2 Sensitivity

To assess the significance of potential impacts on the OUV of the GBRWHA and other environmental values, sensitivity categories have been applied to each of the values (where possible). The sensitivity categories are split into four discrete groups as described in Table 2.6, and it is noted that values are categorised into the sensitivity category that best aligns (ie not all of the points outlined in the description need to apply to the value). These groupings are based on qualitative assessments utilising information related to the sensitivity of the OUV of the GBRWHA and other environmental values, in addition to the potential of value occurring within the region.

Through the determination of sensitivity categories for each of the values, the aspects are then able to be assessed through a matrix against the magnitude of the potential impact type to indicate the level of consequence for each of the impact types on the OUV of the GBRWHA and other environmental values.

Table 2.6 Sensitivity criteria for the OUV of the GBRWHA and other environmental values within the master planned area and surrounding areas

Sensitivity	Description
Low	<p>The value is not listed on any recognised or statutory register. It might be recognised locally by relevant suitably qualified experts or organisations (eg historical societies and/or Universities).</p> <p>The value is in a poor to moderate condition as a result of threatening processes (ie anthropogenic), which have degraded its intrinsic value (low condition value). This includes social amenity and cultural heritage values in highly disturbed environments that are not considered to contribute toward the OUV of the GBRWHA in the master planned area.</p> <p>It is not unique or rare and numerous representative examples exist throughout the system/area.</p> <p>It is abundant and widely distributed throughout the master planned area.</p> <p>The value has a high resilience/adaptive capacity and has a low susceptibility to potential impacts. There is no detectable response to change or change does not result in further degradation of the value.</p> <p>The abundance and wide distribution of the value ensures replacement of unavoidable losses is achievable.</p>
Moderate	<p>The value is recorded as being important at a regional level, and may have been nominated for listing on recognised or statutory registers.</p> <p>The value is in a moderate to good condition despite it being exposed to threatening processes (ie anthropogenic). It retains many of its intrinsic characteristics and structural elements. This includes social values such as air quality and social amenity, and cultural heritage values in moderately disturbed areas.</p> <p>It is relatively well represented in the master planned area, or within its geographic range, however may be limited in distribution or abundance due to threatening processes.</p> <p>Changes resulting from activities within the master planned area may lead to degradation of the environmental value, but replacement of unavoidable losses is possible due to its abundance and distribution. Includes the OUV of the GBRWHA attributes that comply with one or more of the above criteria.</p>
High	<p>The value is listed on a recognised or statutory state, national or international register as being of conservation significance (eg EPBC Act, <i>Fisheries Act 1994</i>), including species listed as:</p> <ul style="list-style-type: none"> ■ Vulnerable or migratory under the EPBC Act, and/or ■ Vulnerable or Near threatened under the provisions of the NC Act <p>The value is intact and retains its intrinsic value (ie high condition value).</p> <p>The value is unique to the environment in which it occurs. It is geographically restricted or is poorly represented in the region or state. This includes cultural heritage values that are intact and contribute toward the expression of the OUV of the GBRWHA within the master planned area (eg cultural values located on the inshore islands that have not been previously disturbed).</p> <p>It has not been exposed to threatening processes (ie anthropogenic), or they have not had a noticeable impact on the integrity of the value.</p> <p>Includes the OUV of the GBRWHA attributes that comply with one or more of the above criteria.</p>

Sensitivity	Description
Very high	<p>The value is listed on a recognised or statutory state, national or international register as being of very high conservation significance (eg EPBC Act, NC Act, <i>Fisheries Act 1994</i>), including species listed as:</p> <ul style="list-style-type: none"> ■ Critically endangered, or ■ Endangered under the EPBC Act, and/or ■ Species listed as endangered under the provisions of the NC Act. <p>The value is intact and retains its intrinsic value (ie very high condition value).</p> <p>The value is unique to the environment in which it occurs.</p> <p>It has not been exposed to threatening processes (ie anthropogenic), or they have not had a noticeable impact on the integrity of the value.</p> <p>Includes the OUV of the GBRWHA attributes that comply with one or more of the above criteria.</p>

Table note:

* OUV for natural heritage for the Port of Gladstone have been identified in the Independent Review of the Port of Gladstone Report on Findings (2013)

2.4.2.3 Consequence of impact

The consequence of a potential impact is a function of the **sensitivity** of the environmental value, and the type and **magnitude** of the potential impact. While the **sensitivity** of the environmental values in a particular area will generally not change (ie determined qualitatively by the interaction of the value’s condition, adaptive capacity and resilience) (refer Figure 2.1), there is potential for the reduction of the **magnitude** of the impact(s) (and therefore **consequence**) associated with some activities (eg avoidance or minimisation of area of impact). The **magnitude** of the potential impact is variable and may be categorised quantitatively to facilitate the prediction of the consequence of the potential impact.

Once the environmental value is identified, and the **sensitivity** of the value and the **magnitude** of the potential impact are determined, this facilitates the assessment of the consequence of the potential impact through use of a consequence matrix (refer Table 2.7).

Table 2.7 Consequence assessment matrix

Magnitude of impact	Sensitivity of the environmental value			
	Low	Moderate	High	Very High
Negligible	Negligible	Negligible	Low	Low
Low	Low	Low	Moderate	High
Moderate	Low	Moderate	High	Very High
High	Moderate	High	Very High	Very High
Very high	Moderate	High	Very High	Very High

Table note:

Significance categories as identified in Table 2.7 are defined in Table 2.8

Table 2.8 Consequence category definitions

Consequence rating	Description
Negligible	Minimal change to the existing situation, including impacts which are beneath levels of detection, impacts that are within the normal bounds of natural variation or impacts that are within the margin of forecasting error. Recovery periods associated with these impacts are within one or two seasons (ie 3 to 6 months).
Low	These impacts are recognisable, but acceptable within the decision making process. They are still important in the determination of environmental management requirements. These impacts tend to be shorter, or temporary (recovery periods of greater than 6 months up to 12 months) and at the local scale.
Moderate	These impacts are relevant to decision making, particularly for the determination of environmental management requirements. Receptors are moderately sensitive and have moderate resilience/adaptive capacity and/or the impacts are local or regional significance. These impacts tend to range from short to medium term (recovery periods of 1 to 4 years are likely), and occur over medium scale areas or focussed within a localised area.
High	These impacts are of importance to the decision making process. Receptors are highly to moderately sensitive, have low to moderate resilience/adaptive capacity and the impacts are of state significance. They tend to be permanent or otherwise medium term to long term (recovery periods of 5 to 9 years are likely), and can occur over localised to large scale areas.
Very high	These impacts are considered to be critical to the decision making process. Receptors are extremely sensitive, have low resilience/adaptive capacity and the impacts are of national significance. Impacts tend to be permanent, or irreversible (if recovery is possible, it is greater than 10 years), or otherwise long term, and can occur over large scale areas.

The likelihood and consequence of each potential impact on an environmental value have been applied to the risk matrix shown in Table 2.9 to define the initial risk level (with existing statutory requirements and operational environmental management measures implemented). The risk level is re-evaluated when a PMM is proposed. Section 2.5 provides the methodology adopted to identify the need for a PMM for a particular activity potential impact on environmental values.

Table 2.9 Risk matrix

Likelihood (refer Table 2.3)	Consequence rating				
	Negligible	Low	Moderate	High	Very high
Rare	Negligible	Negligible	Low	Medium	High
Unlikely	Negligible	Low	Low	Medium	High
Possible	Negligible	Low	Medium	High	Very high
Likely	Negligible	Medium	Medium	High	Very high
Almost certain	Low	Medium	High	Very high	Very high

If an activity is likely to have a positive or beneficial impact on an environmental value these activities have been noted.

Table 2.10 provides the risk category definitions.

Table 2.10 Risk definitions and actions associated with hazard risk categories

Hazard risk category	Hazard risk grade definition
Negligible	No additional management is required.
Low	These risks should be recorded, monitored and controlled as part of the existing statutory requirements and operational environmental management measures.
Medium	Risks and impacts at this level should be managed through existing statutory requirements and operational environmental management measures. However a PMM has the potential to be implemented to further reduce the risk rating. These risks could also be managed through the port overlay and/or other conclusions.
High	If not properly addressed, a risk event at this level may have a significant residual adverse impact on the OUV of the GBRWHA, MNES, MSES and/or other environmental values. These risks will require additional management through the implementation of a PMM and/or other conclusions. PMMs need to be very reliable and should be approved and monitored in an ongoing manner.
Very high	Activities with unmitigated risks at this level should be avoided. If not properly addressed there may be a wide spread significant residual adverse impact across a number of the OUV attributes of the GBRWHA, MNES, MSES and other environmental values. These risks will require additional management through the implementation of a PMM. PMMs need to be very reliable and should be approved and monitored in an ongoing manner.

2.5 Identification of priority management measures

A range of existing statutory requirements and operational management measures have been identified as part of the risk assessment process, and have been classified into categories based on one of the following methods of implementation:

- Statutory land use approval processes (ie GPC LUP, GSDA Development Scheme and GRC Planning Scheme)
- Commonwealth and Queensland government environmental approval process
- Existing operational management (eg environmental monitoring, management plans)

The process implemented for identifying PMMs for potential development activities within the master planned area included:

- Assessment of the gaps and potential for the existing statutory requirements and operational management measures to address and minimise the potential impacts
- Assessment of whether inconsistencies, information and management gaps, and implementation timeframe gaps are likely to occur during the implementation of existing statutory requirements and operational management measures over the master planning timeframe
- Assessment of the security of non-statutory measures (ie voluntary) over the master planning timeframe
- Identification of PMM and reasoning/justification for the measure being required
- Identification of the implementation mechanism and responsible entity (including appropriate advisory entities) for the PMM

Furthermore, PMMs are measures that are determined to be important to the future and ongoing management of potential impacts on the OUV of the GBRWHA and other environmental values within, and surrounding, the master planned area.



3 Mapping of values

3.1 Limitations of the mapping of environmental values

Section 2.1 details the methodology utilised for mapping the environmental values within the master planned area for the risk assessment, with Table 2.1 providing:

- Reference for the sources used to map values within the master planned area and surrounds
- Any changes since the mapping was presented in the Evidence Base Report
- Limitations of the mapping provided and the datasets that are currently available

Although all mapping has been undertaken using the most recent available data, a summary of the key limitations and gaps identified as part of the mapping of environmental values within the master planned area and surrounding areas are provided below.

- The majority of datasets have been developed using remotely sensed data and therefore require verification through project-specific field surveys
- Gaps in flora species, fauna habitat and vegetation community mapping include:
 - Predicted habitat mapping in Appendix B is not currently available for all of the threatened flora and fauna species (ie under the NC Act and/or EPBC Act) likely or known to occur within the master planned area. It is anticipated that additional habitat models will continue to be developed by DSITI in the future, and this will assist in reducing this known gaps. Project-specific impact assessments may also assist in ground-truthing this mapping through field surveys.
 - TECs and REs have been mapped using the available RE data. Although this dataset is regularly updated by DNRM, not all mapped areas have been verified through field surveys.
 - Information on the distribution, abundance or density of marine megafauna, marine turtles and other marine reptiles is not readily available as a dataset or as a single information source. However it is important to note that GPC is collecting data on the movement of these species within Port Curtis (refer Table 2.1).
 - No currently available mapping of habitat or potential habitat for migratory seabirds, woodland, or freshwater wetland migratory birds are available within the master planned area. However it is important to note that GPC will be collecting data on seabird habitat mapping in 2017.
- Indigenous cultural heritage values are mapped in relation to the location of artefact sites, and there is a potential gap in terms of other cultural heritage values and interactions with the land and marine areas of the master planned area

- 
- Social values associated with recreational opportunities and natural amenity within the marine component of the master planned area are not mapped as a single data layer. It is anticipated that additional assessments would be required to comprehensively map out these values, however, they are generally described within the Evidence Base Report. These mapping limitations were identified prior to assessment of the potential impacts and risks, and were appropriate, form part of the recommended PMMs (refer Section 5.7) and the conclusions (refer Section 5.8) of this report.

3.2 Summary of environmental values mapping

An independent review of the Port of Gladstone was conducted in 2013, with the findings documented in *Independent Review of the Port of Gladstone – Report on Findings, July 2013* (DSEWPaC 2013). This review identified that attributes of the OUV of the GBRWHA that are present within the Port of Gladstone, comprising four key themes:

- Connectivity
- Geological features
- Biological diversity
- Human interaction

To give due consideration to the OUV of the GBRWHA within the master planned area, a key component of the EMF process is to accurately map the environmental values using relevant, recent and comprehensive datasets.

Table 3.1 lists the attributes and relevant OUV criteria that were identified as being expressed within the Port of Gladstone in the 2013 *Independent Review of the Port of Gladstone* (DSEWPaC 2013), and summarises the values within the master planned area and surrounding areas. This table also identifies the values or locations that significantly contribute to the OUV of the GBRWHA and are expressed in the master planned area. This information has been collated from the information contained within the following reports:

- Evidence Base Report for the Proposed Gladstone Port Master Planned Area (AECOM 2016)
- Independent Review of the Port of Gladstone (DSEWPaC 2013)
- Great Barrier Reef Region Strategic Assessment – Strategic Assessment Report (GBRMPA 2014a)
- Great Barrier Reef Region Strategic Assessment – Strategic Assessment Report – Supplementary Report (GBRMPA 2014b)
- Mapping provided in Appendices A and B of this report

Table 3.1 Outstanding Universal Value of environmental values within the master planned area and surrounding areas

Attribute	OUV criteria ¹				Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³	ix ⁴	x ⁵		
Environmental values						
Fringing reefs	✓	✓	✓	✓	Coral reef ecosystems within and surrounding the marine precinct provide habitats that contribute towards the biological diversity of species within the region, with some marine species relying on coastal and offshore reefs for part/all stages of their lifecycle. Figure A.7 shows the extent of reefs using indicative reef boundaries.	<ul style="list-style-type: none"> ■ Coral reefs on the seaward side of Curtis Island and Facing Island ■ Coral reefs associated with Seal Rocks ■ Turtle Island Reef, Bushy Island Reef and Manning Reef
Inshore turbid reefs		✓	✓	✓		
Coral species – diversity and extent	✓	✓	✓	✓		
Marine water quality			✓	✓	<p>Marine water quality within and surrounding the marine precinct is critical to ongoing biological and ecological processes, and is an important pathway and habitat within the marine ecosystem. The extent, quality and condition of marine habitat (eg seagrass meadows, coral reefs, mangroves) is dependent on marine water quality.</p> <p>Marine water quality within and surrounding the marine precinct is continually changing and is influenced by a range natural and anthropogenic factors (eg estuarine, geology, rainfall, wind, temperature, land use) and it is therefore not mapped for the purposes of this risk assessment.</p> <p>This risk assessment identifies the potential to <i>adversely alter</i> marine water quality throughout the marine precinct as a result of activities, specifically identifying the scale, extent or nature of potential adverse impacts as a result of an activity.</p> <p>No associated mapping, however potential impacts are assessed for each activity.</p>	All marine water within the master planned area and surrounding areas

Attribute	OUV criteria ¹				Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³	ix ⁴	x ⁵		
Fresh water and groundwater quality	N/A				<p>Similar to marine water quality, fresh water and groundwater quality within terrestrial and intertidal areas continually change and are influenced by natural and anthropogenic factors (eg rainfall, soil characteristics, land use) and it is therefore is not mapped for the purposes of this risk assessment.</p> <p>This risk assessment identifies the potential to <i>adversely alter</i> fresh water and groundwater quality throughout the master planned area as a result of activities, specifically identifying the scale, extent or nature of potential adverse impacts as a result of an activity.</p> <p>No associated mapping, however potential impacts are assessed for each activity.</p>	<p>Freshwater and groundwater sources within the master planned area have potential to influence marine and fresh water quality, river deltas and the associated OUV of the GBRWHA</p>
Fish and nekton	✓		✓	✓	<p>The diversity of fish and nekton within and surrounding the marine precinct is important in terms of aesthetic values (ie diversity in the shape, size and colour of fish and nekton) and ecological/biological values (ie role in trophic structures, provision of ecosystem services).</p> <p>Important habitat for fish and nekton within and surrounding the marine precinct is generally associated with coral reefs, mangrove communities, seagrass meadows and estuarine environments (Lucas et al. 1997). Therefore, potential adverse impacts on these habitats is also likely to adversely affect the biological diversity of fish and nekton.</p> <p>Due to the spatial and temporal variability in fish and nekton diversity within the broader region, it is difficult to accurately map all the important locations within and surrounding the marine precinct. This risk assessment focuses instead on the potential impacts to important habitats and connectivity between habitats to determine the risk to fish and nekton as a result of an activity.</p> <p>Habitat areas considered to be important to fish and nekton include (but are not limited to) Figure A.5 (Regional Ecosystems containing mangroves), Figure A.6 (Extent of seagrass meadows), Figure A.7 (Reefs), Figure A.8 (Benthic macroalgae distribution and density), Figure A.9 (Fish habitat areas and fish movement passages).</p>	<ul style="list-style-type: none"> ■ Adjacent Colosseum Inlet FHA and proposed Calliope River FHA ■ Fish species protected under the EPBC Act and/or NC Act that occur within the master planned area ■ Biological diversity of fish and nekton within the master planned area



Attribute	OUV criteria ¹			Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³	ix ⁴		
Marine megafauna	✓	✓	✓	<p>The GBRWHA is a significant refuge for cetacean and other marine megafauna biodiversity (Lucas et al. 1997), including whales, dolphins and dugong.</p> <p>Port Curtis and adjoining waterways support a range of megafauna species, including whales, dolphins and dugongs. Marine megafauna species form an important component of the marine biodiversity values of the GBRWHA due to their ability to regulate and maintain balance in the food chain by ensuring that prey species do not overpopulate and destroy the species below them in the food chain.</p> <p>Due to the highly mobile nature of marine megafauna, it is difficult to accurately map the density of all species.</p> <p>The density of dugong has been mapped based on the results of aerial surveys and is shown in Figure A.10 (Relative dugong density based on aerial surveys from 1986 to 2005 and Dugong Protection Areas). Habitat considered important to dugong has also been mapped in Figure A.6 (Extent of seagrass meadows) and Figure A.8 (Benthic macroalgae and macroinvertebrate distribution and density).</p> <p>For other species of marine megafauna where habitat and/or densities is not easily mapped, potential impacts on these species has been assessed for each activity based on their possible presence throughout the marine precinct.</p>	<ul style="list-style-type: none"> ■ Dugong populations that utilise habitats within the master planned area and the Rodds Bay Dugong Protection Area ■ Other marine megafauna species commonly recorded within the master planned area protected under the EPBC Act and/or the NC Act (eg Australian humpback dolphin, Australian snubfin dolphins, Coastal bottlenose dolphin, Indian ocean bottlenose dolphin, Humpback whale)

Attribute	OUV criteria ¹			Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA	
	vii ²	viii ³	ix ⁴			x ⁵
Marine turtles and other marine reptiles	✓			✓	<p>It is commonly known that the Port Curtis region supports populations of Green, Loggerhead, Hawksbill and Flatback turtles, while other species such as the Olive ridley and Leatherback turtles are known to occur in the Port Curtis region but are seldom seen (GBRMPA 2015a).</p> <p>Marine turtles undertake extensive migrations of up to 3,000 km between nesting beaches and feeding areas, but repeatedly return to the same nesting and feeding areas throughout their lives. Turtle nesting areas are situated on the eastern side of Facing Island and are mapped in Figure A.11 (Marine turtle nesting areas).</p> <p>Other areas that are important habitat or foraging resources for marine turtles and other marine reptiles are mapped in Figure A.6 (Extent of seagrass meadows), Figure A.7 (Reefs) and Figure A.8 (Benthic macroalgae and macroinvertebrate distribution and density).</p>	<ul style="list-style-type: none"> ■ Marine turtle populations that utilise the master planned area for foraging and nesting ■ Nesting beaches on the seaward side of Facing Island and Curtis Island ■ Nesting beaches at Tannum Sands and Wild Cattle Island ■ Other marine reptiles known to occur in the master planned area protected under the EPBC Act and/or the NC Act (eg sea snakes and kraits, estuarine crocodiles)
Macroinvertebrates	✓	✓	✓	✓	<p>Benthic macroinvertebrate communities within a marine estuary are made up of those organisms dwelling on the sediment surface (ie epifauna) and those which are buried within the sediment (ie infauna), which utilise the surface and subsurface sediment area for feeding and habitat.</p> <p>Benthic macroinvertebrate communities are an essential component of all estuarine ecosystems and play an important role in ecological processes such as nutrient recycling (enhancing nitrification and denitrification) and maintaining of water quality. They also serve as an important food source for higher trophic levels such as shorebirds and fish species.</p> <p>Macroinvertebrate communities are shown in Figure A.8 (Benthic macroalgae and macroinvertebrate distribution and density).</p>	<ul style="list-style-type: none"> ■ Macroinvertebrate communities within the deep water areas within the master planned area ■ Open coastal waters in areas surrounding the master planned area



Attribute	OUV criteria ¹			Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³	ix ⁴		
Shorebirds, migratory birds and seabirds	✓		✓	<p>The Curtis Coast region, including the master planned area, contributes approximately 8% of the total population of migratory shorebirds in Queensland with an average population size during monitoring events in excess of 29,500 birds (population size calculated as a sum of the average counts over time for each species) (I MEMS 2013). Important roosting sites identified from previous shorebird surveys are also located within the master planned area.</p> <p>A diverse range of habitat types occur within the master planned area as shown in Figure A.12 (Shorebird habitat), providing foraging and roosting habitat for a range of migratory bird species.</p>	<ul style="list-style-type: none"> ■ Populations which have exceeded 0.1% of total East Asian-Australasian Flyway population within the master planned area (refer I MEMS [2013] and other Gladstone shorebird monitoring results), including the following species: <ul style="list-style-type: none"> - Eastern curlew - Terek sandpiper - Grey-tailed tattler - Curlew sandpiper - Lesser sand plover - Ruddy turnstone ■ Roost sites within the master planned area at the following locations identified through Gladstone monitoring programs as important, including: <ul style="list-style-type: none"> - Friend Point on Kangaroo Island - North Passage and South Passage Islands - Habitat within the vicinity of Port Central and surrounds - Boyne Island Beach - Facing Island, on the Harbour facing side (refer Figure A.12) - Tiber Point at the entrance to Colosseum Inlet



Attribute	OUV criteria ¹			Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³	ix ⁴		
Threatened and endangered flora and fauna species				<p>Flora and fauna assemblages within coastal areas and the continental islands are considered to contribute toward the OUV of the GBRWHA. These areas contain a high flora and fauna species diversity, including a range of threatened and endangered species.</p> <p>Within the master planned area, the continental islands (eg Curtis and Facing Islands) support regions of protected/regulated vegetation which are important refuges for maintaining species' diversity within the region. Coastal areas along the mainland provide a diversity of habitats and support a diverse range of flora and fauna.</p> <p>Threatened flora and fauna species habitat have been mapped using a range of data sources: known records of threatened flora species and 'high risk' areas are shown in Figure A.1 (Herbreds threatened flora species records and protected plan survey 'high risk' trigger areas); important habitat for threatened flora and/or fauna species is mapped collectively in Figure A.13 (Essential Habitat for threatened terrestrial flora and fauna species) and Figure A.14 (Matters of local and state environmental significance); and a series of predictive habitat models developed by EHP.</p> <p>Predictive flora and fauna habitat models developed by DSITI are provided in Appendix B, Figures B.1 to B.66.</p>	<ul style="list-style-type: none"> ■ Threatened flora and fauna species and communities associated with coastal areas, marine areas, Curtis Island, Facing Island and other inshore islands ■ Other threatened species listed under other values within this table ■ Though this report has utilised the best available information for mapping potential habitat for threatened and endangered flora and fauna species, additional project related assessment and mapping are required to identify locations and/or species that make a significant contribution to the OUV of the GBRWHA

Attribute	OUV criteria ¹		Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³ ix ⁴ x ⁵		
Terrestrial vegetation communities (including threatened ecological communities)	✓	✓	<p>As described above, terrestrial vegetation communities provide habitat to support the diversity of flora and fauna assemblages within the master planned area and surrounding areas.</p> <p>There are a number of threatened ecological communities and Regional Ecosystems within the master planned area which are restricted in extent, either as a result of previous land management practices (eg broad scale clearing, fragmentation, edge effects, etc.) and/or due to a naturally restricted distribution (eg due to very specific habitat requirements).</p> <p>Terrestrial vegetation communities are mapped in Figure A.2 (Threatened ecological communities), Figure A.3 (Endangered and Of concern Regional Ecosystems), Figure A.4 (Least concern Regional Ecosystems), and Figure A.18 (Biodiversity Planning Assessment mapping areas).</p>	<ul style="list-style-type: none"> ■ Intact, remnant vegetation communities (both terrestrial and intertidal communities) and TECs associated Curtis Island, Facing Island and other inshore islands ■ Intact, remnant Coastal Saltmarsh TEC situated between Fisherman's Landing and Wiggins Island ■ Intact, remnant vegetation communities associated with Boyne Island Beach and coastal dunes ■ Intact, remnant Coastal Saltmarsh TEC associated with South Trees Inlet
Mangroves and intertidal vegetation communities	✓	✓	<p>Within the GBRWHA there have been 37 species of mangrove recorded, which equates to approximately half of the total number of mangrove species in the world (Lucas et al. 1997). Mangroves provide important and structurally complex habitats for a range of taxa, including juvenile fish, invertebrates, nekton and other marine fauna.</p> <p>Port Curtis supports a diverse array of mangrove species as it is the overlap between tropical and sub-tropical mangrove species habitat. There are a number of mangrove species present within the master planned area, some of which are considered to be at/hear their known geographic extent.</p> <p>Mangroves play an important role in the stabilisation of sediments within coastal and estuarine systems, reducing the risk of erosion and sedimentation of estuarine and marine waters (and the associated adverse impacts on water quality and marine flora and fauna species).</p> <p>Mangrove ecosystems are mapped in Figure A.5 (Regional Ecosystems containing mangroves).</p>	<ul style="list-style-type: none"> ■ Intact, remnant mangrove communities associated with: <ul style="list-style-type: none"> - Curtis Island, Facing Island and other inshore islands - The Narrows - Coastline situated between Fisherman's Landing and Wiggins Island - Boyne Island Beach and coastal dunes - South Trees Inlet

Attribute	OUV criteria ¹					Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³	ix ⁴	x ⁵			
Seagrass and macroalgae	✓	✓	✓	✓	✓	<p>Seagrasses and macroalgae provide a range of critically important and economically valuable ecosystem services along the coastline of Queensland, including coastal protection by restricting water movement, support of fisheries production, nutrient cycling and particle trapping.</p> <p>The extent of seagrass meadows (from surveys between 2002 and 2014) is mapped in Figure A.6 (Extent of seagrass meadows) and the extent of benthic macroalgae is mapped in Figure A.8 (Benthic macroalgae and macroinvertebrate distribution and density).</p>	<ul style="list-style-type: none"> ■ The following seagrass meadows are considered to be of high ecological value within the master planned area: <ul style="list-style-type: none"> - Pelican Banks North and South - Facing Island - Quoin Island ■ Macroalgae communities associated with Seal Rocks reef and the seaward side of Facing Island
Wetlands	✓	✓	✓	✓	✓	<p>There are 15,000 km² of wetlands within the catchments of the Great Barrier Reef, which serve to capture and filter nutrients, pollutants and sediment load, and regulate the water quality of the Great Barrier Reef.</p> <p>Within the port master planned there are two areas mapped as nationally significant wetlands: the Port Curtis wetland complex and The Narrows wetland complex, as shown in Figure A.16 (Directory of Important Wetlands). These wetlands are recognised as containing important habitat for a range of fish, nekton, marine megafauna, and migratory species. A number of mangrove species represented within the Port Curtis wetland are at the limit of their geographical distribution.</p> <p>There are also several locations within the master planned area that are mapped as being wetlands of State environmental significance and are of 'High Ecological Significance' (Figure A.14 (Matters of local and state environmental significance). Figure A.15 (Wetlands) shows the location and extent of coastal/subcoastal, estuarine and riverine wetlands within the region.</p>	<ul style="list-style-type: none"> ■ Wetlands associated with Facing Island, Curtis Island and other inshore islands ■ Estuarine wetlands associated with: <ul style="list-style-type: none"> - The coastline between Fisherman's Landing and Wiggins Island - Boyne Island - Pelican Banks North and South - South Trees Inlet - Friend Point Kangaroo Island - The Narrows

Attribute	OUV criteria ¹			Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³	ix ⁴		
Continental islands	✓	✓	✓	✓	<ul style="list-style-type: none"> ■ Curtis Island, Facing Island and other inshore islands, and their mudflats, beaches, dune systems, inlets, bays and other shoreline habitats ■ Beaches and dunes associated with Boyne Island and Kangaroo Island ■ River deltas of the Calliope River and Boyne River ■ Connectivity values associated with The Narrows
Beaches	✓			✓	
Dune systems	✓	✓			
River deltas	✓	✓	✓	✓	
Connectivity: cross-shelf, longshore and vertical		✓	✓	✓	
Protected areas	N/A				<p>A range of protected areas are present within the master planned area as listed under the provisions of state and Commonwealth legislation. These areas are mapped in Figure A.17 (Protected areas), Figure A.19 (Great Barrier Reef Marine Park Zones – Commonwealth) and Figure A.20 (Great Barrier Reef Marine Park Zones – State).</p> <p>Within the master planned area there are high risk/high probability areas associated with acid sulfate soils (ASS) (Figure A.21 (Atlas of Australian Acid Sulfate Soils)) and Fire ants (Figure A.22 (Gladstone Fire Ant Restricted Area)). These areas have been considered in the risk assessment and potential impacts within these areas are considered for relevant activities and causes.</p>
Acid sulfate soils	N/A				N/A
Pest and weeds	N/A				N/A
Social values					
<p>The social values within the master planned area are described within the Evidence Base Report. Potential impacts on social values have been considered for each of the potential activities and causes.</p> <p>Mapping of heritage values, recreation areas and social infrastructure has also been included within Appendix A as referenced below.</p>					
Heritage properties	N/A				N/A

Attribute	OUV criteria ¹				Summary of attribute and figure reference	Environmental values within the master planned area and surrounding areas that contribute to the OUV of the GBRWHA
	vii ²	viii ³	ix ⁴	x ⁵		
Socio-economic factors	N/A				Described within the Evidence Base Report. Potential impacts on social values have been considered for each of the potential activities and causes.	N/A
Social and community infrastructure	N/A				Figure A.28 (Social and community infrastructure)	N/A
Recreational opportunities and natural amenity	N/A				Figure A.29 (Recreational opportunities and natural amenity)	N/A
Cultural heritage values						
Traditional Owner interaction with the natural environment			✓		<p>The master planned area contains values in terms of traditional Aboriginal use of land and sea. There are a number of culturally significant sites within the master planned area, as well as areas where access to particular areas provides culturally significant opportunities (eg can be recognised formally through indigenous land use agreements).</p> <p>The figure references below identify areas of potential cultural heritage significance within the master planned area. Potential impacts have been identified for each of the activities and causes.</p> <p>Figure A.25 (Indigenous land use agreements)</p> <p>Figure A.24 (Native title determination areas)</p> <p>Figure A.23 (Indigenous cultural heritage sites)</p>	<ul style="list-style-type: none"> Locations of Indigenous cultural heritage artefacts/sites
Native Title	N/A					N/A
Culturally Significant Heritage Sites	N/A					N/A

Table notes:

- 1 Adapted from the *Independent Review of the Port of Gladstone – Report on Findings, July 2013* (DSEWPaC 2013)
- 2 vii Aesthetic values and superlative natural phenomena
- 3 viii Ongoing geological processes
- 4 ix Ecological and biological processes
- 5 x Biodiversity conservation



4 Summary of existing statutory requirements and operational environmental management measures

Table 4.1 provides a summary of the existing statutory requirements and operational environmental management processes for the master planned area.

Table 4.2 provides the existing GPC SPL statutory requirements, while Table 4.3 provides the existing operational environmental management measures.

Table 4.4 provides the existing GSDA Development Scheme statutory requirements.

Table 4.5 provides the existing GRC Planning Scheme requirements and additional operational environmental management measures.

Table 4.1 Summary of the key existing statutory requirements and operational environmental management processes for the master planned area

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth) (EPBC Act)	A Project action which has, will have or is likely to have an impact on a MNES will require some level of impact assessment (eg EIS). If an EIS is required, it must be prepared to address the EIS Guidelines, and approved by the Commonwealth.	All OUV and MNES	Requirement to prepare EIS (or other documentation) under the EPBC Act EIS assessment process with approval conditions requiring environmental value management plans (EVMPs), offsets (where required) and other measures
<i>Environment Protection (Sea Dumping) Act 1981</i> (Cwth) (Sea Dumping Act)	A Sea Dumping Permit is required to authorise the placement of all unconfined dredged material at sea	Marine water quality values Marine ecological values	Act requires application for annual or long term (ie ongoing operational permits) Sea Dumping Permits application to be made and assessed Permit conditions requiring EVMPs and other measures
<i>Historic Shipwrecks Act 1976</i> (Cwth) (HS Act)	Protection of historic shipwrecks that are at least 75 years old	Non Indigenous cultural heritage	Heritage value address in other approval processes that would be required within the marine precinct
<i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i> (Cwth) (PP Ships Act)	Discharge into the ocean from ships Implements the MARPOL Convention and is given effect in Queensland by the <i>Transport Operations (Marine Pollution) Act 1995</i> (Qld) (TOMP Act)	Marine water quality Marine ecological values	TOMP Act prescribes marine pollution controls and prevention documentation
<i>State Development and Public Works Organisation Act 1971</i> (Qld) (SDPWO Act)	If the project/activity is declared a Coordinated Project, an EIS or impact assessment report (IAR) is required and the project approved by the Coordinator-General	All OUV, MNES and other environmental values	Requirement to prepare EIS under the SDPWO Act in accordance with EIS Terms of Reference (ToR). EIS/IAR assessment and approval conditions requiring EVMPs, offsets (where required) and other measures
	The SDPWO Act establishes the GSDA Development Scheme as a statutory instrument to regulate development within the GSDA.	Refer below	Refer below

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<p>GSDA Development Scheme prepared under the SDPWO Act (only applies to GSDA)</p>	<p>Projects/activities which propose to undertake 'regulated development' within the GSDA must comply with the GSDA Development Scheme (refer Table 4.3)</p> <p>Regulates material change of use (MCU) excluding environmentally relevant activities (ERAs) and operational work for the clearing of native vegetation within the GSDA</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	<p>Environment and social (in relation to material change in use)</p> <p>General environmental values</p>	<p>State Development Area (SDA) application for SDA approval required when proposing 'regulated development' or compliance with self-assessable code requirements under Schedule 3</p> <p>SDA assessment process including consideration of environmental values. SDA approval conditions requiring EVMPs and other measures</p>
<p><i>Sustainable Planning Act 2009 (Qld)</i> (SP Act) (to be repealed in 2017)</p>	<p>GRC Planning Scheme prepared as a statutory instrument under the SP Act</p> <p>Under the SP Act, GRC is the Assessment Manager for assessable development within the GRC Local government area (LGA) in accordance with Schedule 4, however the following are excluded:</p> <ul style="list-style-type: none"> ■ All aspects of development on land gazetted as SPL, for which GPC is the Assessment Manager under the GPC 2012 Land Use Plan (LUP) ■ Changes in land use within the GSDA which are 'regulated development', and are assessed by the Coordinator-General under the GSDA Development Scheme 	<p>Social (in relation to material change in use)</p> <p>General environmental values (SP Act requires valuable features must be addressed in a planning scheme)</p> <p>Specific environmental values where other statutory approval requirements are integrated into the development application</p>	<p>The Curtis Island Land Management Plan was developed for the Curtis Island Environmental Management Precinct and focuses on:</p> <ul style="list-style-type: none"> ■ Maintaining existing values ■ Enhancement of values through active weed and feral pest control ■ Rationalisation of the existing road network <p>GRC Planning Scheme regulates assessable development within the GRC LGA jurisdiction requiring development applications to be made and assessed (refer Table 4.3)</p> <p>GPC LUP regulates assessable development within the GPC LUP jurisdiction requiring development applications to be made and assessed (Table 4.3)</p> <p>Development assessment process includes consideration of environmental values through planning scheme provisions. Imposes conditions requiring EVMPs and other measures.</p>

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<p><i>Planning Act 2016</i> (Qld) (Planning Act) (to commence in 2017)</p>	<p>The purpose of the Planning Act is to establish an efficient, effective, transparent, integrated, coordinated, and accountable system of land use planning, development assessment and related matters that facilitates the achievement of ecological sustainability</p> <p>The GRC Planning Scheme, GPC LUP and GSDA Development Scheme will also apply under the Planning Act as discussed above</p>	<p>Social (in relation to material change in use)</p> <p>General environmental values</p> <p>Specific environmental values where other statutory approval requirements are integrated into the development application</p>	<p>GRC Planning Scheme regulates assessable development within the GRC LGA jurisdiction requiring development applications to be made and assessed (refer Table 4.3)</p> <p>Development assessment process includes consideration of environmental values through planning scheme provisions. Imposes conditions requiring EVMPs and other measures.</p>
<p>State Planning Policy 2014 (SPP)</p>	<p>Presents the 16 state interests which provide direction to local governments in the plan making and development assessment processes</p> <p>Contains principles on biodiversity, coastal development, cultural heritage and water quality</p>	<p>Environment and heritage values</p>	<p>The state interests within the SPP have been integrated into the GRC Planning Scheme</p>
<p>Central Queensland Regional Plan (CQRP)</p>	<p>Statutory instrument under SP Act which sets out the state's interests in land use planning with specific context for the Central Queensland region</p>	<p>Environment and heritage values</p>	<p>The state interests within the SPP, as they relate to the Central Queensland region, have been integrated into the GRC Planning Scheme</p>
<p>State Development Assessment Provisions (SDAP)</p>	<p>Statutory instrument under SP Act which sets out the matters of interest to the state in the development assessment process.</p> <p>Under the Planning Act this refers to state planning instruments</p>	<p>Social values (community amenity)</p> <p>Fisheries resources values</p> <p>Terrestrial and marine vegetation</p> <p>Heritage</p> <p>Coastal protection and wetlands values</p>	<p>Compliance with applicable SDAP codes assessed as part of development applications where the chief executive of the SP Act or Planning Act is the Assessment Manager or a referral agency</p>
<p><i>Transport Infrastructure Act 1994</i> (Qld) (TI Act)</p>	<p>GPC LUP prepared in accordance with the TI Act</p>	<p>Refer below</p>	<p>Refer below</p>

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<p>GPC LUP prepared under the TI Act (only applies to SPL)</p>	<p>GPC is the Assessment Manager for assessable development on SPL in accordance with Schedule 6 of the SP Act or Planning Act</p> <p>Regulates material change of use (MCU) and other activities (excluding ERAs)</p> <p>Environmental impacts are addressed under the GPC Development Code 2011 (assessment criteria)</p>	<p>Environmental and social values (in relation to material change in use)</p> <p>General environmental values</p> <p>Valuable features, including resources and areas of ecological significance, areas contributing to amenity (scenic, visual and neighbourhood), places of cultural heritage and resources of economic value (such as forestry, fish habitats, etc)</p> <p>Specific environmental values where other statutory approval requirements are integrated into the development permit application</p>	<p>GPC LUP regulates assessable development within SPL and SPL tidal area requiring development applications to be made and assessed (refer Table 4.2)</p> <p>Facing Island Locality – limited sustainable development only that allows small scale recreational use and access to and awareness of the surrounding ecological values</p> <p>Environmental impacts are addressed under the GPC Development Code (assessment criteria)</p> <p>Development assessment process includes consideration of environmental values through Development Code provisions and imposes conditions requiring EVMPs, spill management plans, vessel traffic management plans and other measures</p> <p>State agencies regulate assessable development where statutory approval is required (refer other legislative requirements within this table)</p> <p>Table 4.2 provides further detail on the GPC LUP requirements and Table 4.3 provides operational environmental management measures currently implemented by GPC either in relation to legislative conditions specific to GPC or voluntarily</p>

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<p><i>Sustainable Ports Development Act 2015</i> (Qld) (Ports Act)</p>	<p>Restricts new port development to within the master planned area</p> <p>Restricts capital dredging for development of new or expansion of existing port facilities to within the master planned area</p> <p>Prohibits the sea-based placement of dredged material within the GBRWHA generated by port-related capital dredging</p> <p>Mandates the beneficial reuse of port-related capital dredging (eg land reclamation)</p>	<p>OUV of the GBRWHA</p> <p>Other environmental values</p>	<p>Dredging restrictions and beneficial reuse of dredged material mandated within the Ports Act</p>
<p><i>Aboriginal Cultural Heritage Act 2003</i> (Qld) (ACH Act)</p>	<p>Requires the preparation and implementation of a master plan</p>	<p>All environmental values in the master planned area and surrounding areas</p>	<p>PMMs (refer Section 5.7) and the port overlay</p>
<p><i>Aboriginal Cultural Heritage Act 2003</i> (Qld) (ACH Act)</p>	<p>Establishes a 'duty of care' to take all reasonable and practicable measures to avoid harm to Aboriginal cultural heritage</p> <p>Establishes a cultural heritage register and database to collect and register information about sites, items, places and values</p> <p>Cultural Heritage Management Plan (CHMP) approval is a statutory requirement for projects in certain instances (eg project that requires approval under another Act, and that Act requires an environmental assessment or EIS; or under SP Act or the Planning Act, a development requires the chief executive of the ACH Act as a concurrence agency)</p> <p>Projects which do not trigger a statutory requirement to prepare a CHMP can opt to develop one voluntarily to assist in adhering to the duty of care requirements</p>	<p>Indigenous cultural heritage values</p>	<p>CHMP required as part of EIS process under the EPBC Act, SDPWO Act and EP Act</p> <p>Required to be addressed as part of development assessment process where CHMP is stipulated as being required or chief executive of ACH Act is triggered as a concurrence agency</p> <p>Obligation on all persons to ensure compliance with the Cultural heritage 'duty of care' at all times</p> <p>Indigenous Land Use Agreement (eg GPC Cultural Heritage Protocol) or another agreement with an Aboriginal party</p>

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<p><i>Biosecurity Act 2014</i> (Biosecurity Act) (Qld)</p>	<p>Establishes a general biosecurity obligation upon all persons to take all reasonable and practical steps to prevent or minimise state biosecurity risks</p> <p>A person (including landowners and commercial operators) are required to take all reasonable and practical measures to prevent or minimise biosecurity risks (eg management of invasive plants and animals on their land)</p> <p>Fire ant infestations have been confirmed with the master planned area and this area is currently included within the Fire Ant Biosecurity Zone. Management measures are in place to manage the movement of material</p> <p>Requirements to be considered in GRC pest management plan for local government area</p>	<p>Terrestrial flora and fauna species, and fauna habitat values</p> <p>Social values (in relation to fire ant control)</p>	<p>Weed and pest management plan</p> <p>Fire ant approved risk management plan or biosecurity authorisation under the <i>Biosecurity Regulation 2016</i></p> <p>Biosecurity Act requirements to be considered in the GRC pest management plan</p>
<p><i>Coastal Protection and Management Act 1995</i> (Qld) (CPM Act) prescribed by the SP Act</p>	<p>Protection, conservation rehabilitation and management of the coastal zone, including its resources and biological diversity</p> <p>Approval required for coastal assessable development through the SP Act or the Planning Act (eg tidal/prescribed tidal works, works completely or partly within a Coastal Management District, Allocation of Quarry Material)</p>	<p>Social and Indigenous cultural heritage values (managing public access to the natural foreshore)</p> <p>Water quality</p> <p>Intertidal and marine vegetation and fauna habitat values</p> <p>Coastal dunes and erosion prone areas</p>	<p>Development application for operational works assessable under SP Act or Planning Act. Approval conditions requiring EVMPs and other management measures</p> <p>Allocation of Quarry Material assessed under CPM Act</p> <p>Approval conditions requiring EVMPs, offsets (where applicable) and other measures</p>

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<p><i>Environmental Offsets Act 2014</i> (Qld) (EO Act)</p>	<p>Prescribes that the significant residual impacts of particular activities on prescribed environmental matters are to be addressed through the provision of environmental offsets</p> <p>Prescribed activities for which offsets may be imposed include (but are not limited to) ERAs under the EP Act, taking a protected plant within the meaning of the <i>Nature Conservation Act 1992</i> (NC Act) under a protected plant clearing permit approved under the <i>Nature Conservation (Administration) Regulation 2006</i> (NC Reg) in an area outside of a protected area, and development for which an offset may be required under the SDAP or state planning instruments</p>	<p>Terrestrial, intertidal and marine flora species and fauna habitat values</p>	<p>Offsets provided for significant residual impacts to prescribed environmental matters as either:</p> <ul style="list-style-type: none"> ■ Financial settlement offsets ■ Proponent-driven offsets (land-based offsets and/or deliver of actions in Direct Benefit Management Plans) ■ Combination of the above
<p><i>Environmental Protection Act 1994</i> (Qld) (EP Act)</p>	<p>Establishes a general environmental duty to prevent and minimise environmental harm</p> <p>Environmental Authority (EA) required to authorise the undertaking of an ERA (agricultural ERA, resource activity or prescribed activity)</p> <p>Approval required to undertake a Concurrence ERA under SP Act where the activity will result in a material change of use</p> <p>Establishes a Suitable Operator Register of persons or corporations who have been registered by EHP as being suitable to carry out an ERA</p>	<p>All of the OUV of the GBRWHA and other environmental values</p>	<p>Development application for a material change of use (Concurrence ERA) assessed under SP Act or Planning Act and application for EA assessed under EP Act</p> <p>Approval conditions requiring EVMPs and other management measures</p> <p>Payment of financial assurance where an activity will result in significant disturbance of land</p>

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
	Environmental Protection Policies (EPPs) (ie noise, air and water) provide a framework for assessing a project's compliance and minimising impacts on environmental values	Social values (minimising noise and air quality impacts) Water quality Terrestrial, bird and marine fauna values (minimising noise) Terrestrial and intertidal vegetation values (minimising dust)	
	Assessment and management of contaminated land and approval needed to remove and dispose of contaminated soil Establishes Environmental Management Register (EMR) and Contaminated Land Register (CLR)	Social values (minimising contaminated soil exposure) Water quality	Assessment of applications for Disposal Permit with approval conditions requiring EVMPs and other measures.
<i>Fisheries Act 1994</i> (Qld) (Fisheries Act) prescribed by SP Act	Management, use, development and protection of fish habitats and resources Approval required for constructing or raising a waterway barrier (temporary or permanent), removal, destruction or damage of marine plants; works in a Fish Habitat Area (FHA) and aquaculture operations	Marine plants and associated fauna habitat values Fish habitat and passage Riparian vegetation and fauna use	Development application for operational works assessed under SP Act or Planning Act. Approval conditions requiring EVMPs and other management measures, including the provision of offsets (where required)
<i>Forestry Act 1959</i> (Qld)	Management and use of state forests, including the management of pests, weeds and bushfire issues The <i>Forestry Act 1959</i> regulates the removal of quarry material from land that is held by the state, including within state forests, timber reserves and entitlement areas, and state plantation forests. Also applies to some roads, leasehold land and freehold land owned by the state	Terrestrial flora and fauna values (in relation to minimising pests, weeds and impacts of bushfires)	State forest management plan An Authority to Search is required to investigate resource availability/potential. A Sales Permit is required to access and commercially use/sell state quarry material

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<i>Queensland Heritage Act 1992</i> (Qld) (QH Act)	Provides for the conservation of Queensland's cultural heritage for the benefit of the community and future generations Regulates development affecting the cultural heritage significance of Queensland heritage places and as well as the provision of heritage management agreements	Non Indigenous cultural heritage values	Development application assessed under SP Act or Planning Act. Approval conditions requiring non Indigenous cultural heritage protection and management measures QH Act permit application and approval conditions requiring cultural heritage protection and management measures
<i>Land Act 1994</i> (Qld)	Management requirements for trustees in accordance with the purpose for which the reserve was dedicated	Terrestrial flora and fauna species, and fauna habitat values (maintenance and management of the land)	Conditions of appointment of the trustee Land Management Plan By-laws (as detailed under the Land Act Regulations)
<i>Nature Conservation Act 1992</i> (Qld) (NC Act)	Conservation, protection or management of wildlife, habitat or areas to ensure the survival of viable populations particularly endangered, vulnerable and near threatened (EVENT) species, and to identify and reduce or remove the effects of threatening processes Establishes mapped high risk 'Flora Survey Trigger Areas' in accordance with NC Act Flora Survey Guidelines Approval required to clear native vegetation, tamper with an animal breeding place, interfere with a cultural or natural resource in a protected area or erecting a structure in a protected area	Terrestrial flora and fauna species, and fauna habitat values	Clearing application assessed under NC Act. Approval conditions requiring EVMPs, offsets (where applicable) and other measures Exempt clearing notifications assessed in accordance with NC Act Flora Survey Guidelines

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<i>Navigation Act 2012</i> (Qld)	<p>Vessels over 70 m in length are required to embark a licenced coastal pilot when transiting the following coastal pilotage areas:</p> <ul style="list-style-type: none"> ■ The Inner Route (from Cape York to Cairns) ■ The Great North East Channel (within the Torres Strait) ■ Hydrographer's Passage ■ Whitsundays (ie Whitsunday Passage, Whitsunday Group and Lindeman Group) 	<p>Water quality</p> <p>Marine flora and fauna and associated habitat values</p>	<p><i>Navigation Act 2012</i> vessel pilot requirements</p>
<i>Petroleum and Gas (Production and Safety) Act 2004 (Qld)</i> (P&G Act)	<p>Regulates activities associated with the exploration and production of petroleum and gas (including operation of petroleum facilities and pipelines)</p> <p>Various leases, licences, permits and authorities required to authorise undertaking of resource activities associated with minerals, coal, petroleum, gas, geothermal and greenhouse gas.</p>	<p>Not applicable</p>	<p>Requires EA under the EP Act to be in effect prior to the granting of a Resource Authority</p> <p>Requires applicant to demonstrate suitable financial and technical capability</p>
<i>Regional Planning Interests Act 2014 (Qld)</i> (RPI Act)	<p>Regulates 'resource' and 'regulated' activities (as defined under the Act) to ensure the protection of areas of Queensland that are of regional interest, including living areas in regional communities, high quality agricultural areas, strategic cropping land and regionally important environmental areas</p>	<p>Priority Living Areas</p> <p>Strategic Cropping Areas</p>	<p>Application for a Regional Interests Development Approval is required to be made and assessed under the Act.</p>
<i>Transport Operations (Marine Pollution) Act 1995 (Qld)</i> (TOMP Act)	<p>Regulates the maritime industry to ensure marine safety, while enabling the effectiveness of efficiency of the Queensland maritime industry to be further developed. Also regulates the protection of Queensland's marine and coastal environment by minimising deliberate and negligent discharges of ship-sourced pollutants into coastal waters.</p>	<p>Water quality</p> <p>Marine flora and fauna and associated habitat values</p>	<p>TOMP Act marine pollution controls and prevention documentation (eg the Queensland Coastal Contingency Action Plan)</p>

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<i>Transport Operations (Marine Safety) Act 1994 (MS Act)</i>	<p>Specifies that, unless a current pilotage exemption certificate is held by the master of a ship, pilotage is compulsory for:</p> <ul style="list-style-type: none"> ■ A ship that is 50 m or more ■ A vessel towing another vessel where the combined length of the vessels is 50 m or more ■ A ship whose owner or master asks for the services of a pilot ■ A ship whose master is directed by the Harbour Master to use the services of a pilot. <p>Anchorage limits and locations are designated on the Port navigational charts and the ship arrival limit without a pilot is six nautical miles radius from the Fairway Buoy. Maritime Safety Queensland directs the ship master to the appropriate anchorage.</p>	<p>Water quality</p> <p>Marine flora and fauna and associated habitat values</p>	<p>MS Act and AMSA vessel pilotage requirements</p>
<i>Vegetation Management Act 1999 (Qld) (VM Act) prescribed by SP Act</i>	<p>The <i>Transport Operations (Marine Safety) Act 1994</i> and regulation also defines the Port of Gladstone pilotage area where compulsory pilotage is required. Pilotage service is provided by the Pilotage Service Division of Maritime Safety Queensland.</p> <p>The Australian Maritime Safety Authority (AMSA) also issues pilotage requirements in the form of marine orders, marine notices and pilot advisor notices.</p> <p>Regulates the clearing of vegetation in a manner that conserves and manages vegetation communities (ie Regional Ecosystems)</p> <p>Regulates the provision of Property Maps of Assessable Vegetation (PMAV) to rectify mapping errors or support management and protection of discrete areas</p>	<p>Terrestrial flora species and vegetation community values</p>	<p>Clearing application assessed under SP Act or Planning Act. Approval conditions requiring EVMs, offsets (where applicable) and other measures</p> <p>PMAV assessment</p>

Statutory requirement and operational environmental management process	Summary of potentially relevant approval trigger or operational environmental management issue addressed	Relevant environmental value protected, managed and/or impacts minimised	Management measure
<p><i>Water Act 2000</i> (Qld) (Water Act) prescribed by SP Act</p>	<p>Regulates the sustainable management of non-tidal waters and other resources</p> <p>Works in a watercourse, lake or spring; taking or interfering with water within defined watercourses are assessable development</p> <p>In addition to approvals triggered under SP Act, the Water Act regulates the undertaking of works that involve the removal of vegetation, excavating or placing fill in a defined watercourse, lake or spring (ie Riverine Protection Permit), unless a proponent has a self-assessable exemption as well as entitlement to take a water resource (Water Licence)</p> <p>Both the Water Resource (Boyne River Basin) Plan 2013 and Water Resource (Calliope River Basin) Plan 2006 apply to portions of the master planned area under the Water Act which regulate the access to and taking of water in a watercourse, lake or spring, or overland flow water</p>	<p>Fresh water and downstream marine water quality</p> <p>Flora and fauna habitat within watercourses, lakes or springs</p>	<p>Water Act application and approval conditions requiring EVMPs and other measures</p> <p>Riverine Protection Permit application and approval conditions requiring EVMPs and other measures</p> <p>Water licence to authorise the taking/allocation of water</p>
<p>Curtis Island environmental protection precinct</p> <p>EPBC Act and SDPWO Act EIS and approval conditions requiring EVMPs, offsets and other measures</p>	<p>EIS approval conditions required the development of an offset proposal and management plan</p>	<p>MNES, MSES and other environmental values</p>	<p>Curtis Island Environmental Management Precinct Land Management Plan (LMP) (Department of Infrastructure and Planning 2010) (herein referred to as Curtis Island GSDA Environmental Management Precinct LMP)</p>

Table 4.2 Strategic Port Land existing statutory requirements

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Environmental protection	Facing Island	Environment	<p>GPC LUP contains the preferred development intent below for the environment precinct</p> <ul style="list-style-type: none"> ■ Environment precincts are designated to protect land because of identified significant ecological values (including cultural heritage) ■ The precinct is used to separate potentially incompatible port land use activities or is used as part of the port's impact mitigation measures to separate port activities from surrounding sensitive land uses <p>Development assessable under SP Act and relevant integrated legislation applicable to development</p> <p>Assessable against the GPC LUP, GPC Port Development Code and other integrated legislation</p>	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation
Marine industry and recreation	Gladstone Marina	Marine industry Parkland and education	<p>GPC LUP contains the preferred development intent below for the marine industry precinct</p> <ul style="list-style-type: none"> ■ This precinct includes land and water based areas for development of a broad range of maritime services, including support of the marina recreational and commercial activities; ■ Development that would require close water access/proximity such as coast guard, maritime services, and processing, light industry or commercial activities that support fishing and boating pursuits (including boat repairs and workshops, seafood processing (and associated retail), chandlery, boat storage is supported ■ Unlike other port commercial or industrial areas, this area has a distinct maritime connection ■ This precinct provides opportunities for public access to the water and harbour in appropriate places (ie where it does not conflict or create safety concerns with general maritime and core port activities) 	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation



Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Marine industry and recreation			<ul style="list-style-type: none"> ■ It includes some limited areas that allow public access, recreation and community benefit ■ The precinct does not include heavy industrial activities but supports service industry or industries that complement and support the port and industry activities ■ Some limited commercial/retail activities that support the marina, educational and tourism/visitor related needs will be supported ■ This precinct includes the marina (land and water based facilities/development) and public boat ramps <p>GPC LUP contains the preferred development intent below for the parkland and education precinct</p> <ul style="list-style-type: none"> ■ This precinct includes port areas that allow public access to the water and harbour and give recreational and community benefit ■ It includes parklands and recreational facilities of various types for all ages including playgrounds, picnic facilities and facilities to support outdoor events and functions ■ The precinct allows for expansion of the University and further education and training services and facilities ■ Development in this precinct does not include industrial activities or any core or related port activities ■ Retail or commercial activities are generally excluded with the exception of some limited commercial/retail activities that are directly linked to or support the educational and training facilities or operations, or the marina, and servicing the visiting public/tourism convenience needs <p>GPC issued development approvals over tenants, assessable against the GPC LUP and GPC Port Development Code and GPC issued lease agreements</p> <p>Development assessable under SP Act and relevant integrated legislation applicable to development</p>		

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Marine industry and recreation	Hanson Road	Light industry and commercial Buffer	<p>GPC LUP contains the relevant preferred development intent below for the light industry and commercial precinct</p> <ul style="list-style-type: none"> ■ Light and/or commercial industry that complement or support port and industry activities ■ This precinct provides a transition from high impact port activities in other nearby precincts to adjacent land uses outside the port area ■ Land in the precinct may also accommodate activities that have an 'interim' function in that the land is preserved by the port authority for future core/strategic needs but accommodates other activities in the short-medium term ■ Land in the precinct may also provide for light /commercial industry uses not directly related to port activities, however, the quantum of the activities must complement the local governments commercial outcomes in the relevant area ■ A diversity of economic activity and employment opportunities are encouraged ■ Land uses could include for example, processing, workshops etc. that support the core industries, which supply port development and construction activities, as well as have a wider commercial role <p>GPC LUP contains the relevant preferred development intent below for the buffer precinct</p> <ul style="list-style-type: none"> ■ Buffer precincts may be used to separate potentially incompatible port land use activities or may be used as part of the port's impact mitigation measures to separate port activities from surrounding sensitive land uses ■ The precinct may be used to preserve land for future port uses, therefore development on this land will be limited to ensure that it does not compromise the ability to use that land for port purposes in the future ■ Measures are to be taken to manage stormwater and minimise erosion 	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Marine industry and recreation			<p>GPC issued development approvals over tenants, assessable against the GPC LUP and GPC Port Development Code and GPC issued lease agreements</p> <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>		
	East Shores	East shores	<p>GPC LUP contains the preferred development intent below for the east shore precinct</p> <ul style="list-style-type: none"> ■ This precinct's waterfront locality and city central business district fringe location provide the opportunity for major urban rejuvenation and community access to the waterfront. This site lends itself to a variety of future land use activities that maximise this prime foreshore/central business district fringe potential including medium density residential, retail, commercial, recreational, community, cultural and entertainment ■ As some of this land is likely to be surplus or inappropriately located to meet the port's long term demand for industrial/port development, it has been identified as a site for urban renewal and will be the subject of an urban design master plan coordinated by GPC (with Council, government and community input) to determine an appropriate long term plan for development ■ Further development in this area will be limited until such time as the master plan is completed. It is intended that the outcomes of this master plan, as appropriate, will be incorporated into this LUP <p>GPC issued development approvals over tenants, assessable against the GPC LUP and GPC Port Development Code</p> <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Interface	Port Central	Port industry	<p>GPC LUP contains the preferred development intent below for the port industry precinct</p> <ul style="list-style-type: none"> ■ Primarily land based, easily recognisable as core port operations, activities and infrastructure such as loading, unloading, stockpiling, storage, goods transfer, pack and unpack facilities, processing, industry and associated ancillary uses (hardstand areas, offices/administrative functions, parking, manoeuvring) are supported ■ Activities that require waterfront location or proximity to waterfront and in particular access or proximity to off shore loading facilities, wharfs, etc. are located in this precinct; ■ The handling and transfer of goods provides for a range of commodities which may be within this precinct or adjoining/nearby ■ The location of these activities brings commercial benefits derived from minimising the supply chain (ie distance separating land based functions and off-shore operations); ■ These areas represent key capital investment in port infrastructure and industry; ■ Development that will support city wide and broader regional activities such as mining and agricultural activities (end point in the supply chain) is supported ■ Development in this precinct may include some limited processing <p>GPC issued development approvals over tenants, assessable against the GPC LUP and GPC Port Development Code</p> <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	South Trees and Boyne Wharf Port Central RG Tanna Coal Terminal Wiggins Island Fisherman's Landing Curtis Island	Port industry Wharves (offshore) Port operations support Light industry and commercial Buffer	<p>GPC LUP contains the preferred development intent below for the port industry precinct</p> <ul style="list-style-type: none"> ■ Primarily land based, easily recognisable as core port operations, activities and infrastructure such as loading, unloading, stockpiling, storage, goods transfer, pack and unpack facilities, processing, industry and associated ancillary uses (hardstand areas, offices/administrative functions, parking, manoeuvring) are supported ■ Activities that require waterfront location or proximity to waterfront and in particular access or proximity to off shore loading facilities, wharves, etc. are located in this precinct; ■ The handling and transfer of goods provides for a range of commodities which may be within this precinct or adjoining/nearby ■ The location of these activities brings commercial benefits derived from minimising the supply chain (ie distance separating land based functions and off-shore operations); ■ These areas represent key capital investment in port infrastructure and industry; ■ Development that will support city wide and broader regional activities such as mining and agricultural activities (end point in the supply chain) is supported ■ Development in this precinct may include some limited processing <p>GPC LUP contains the preferred development intent below for the wharves (offshore) precinct</p> <ul style="list-style-type: none"> ■ Offshore operations, facilities and structures including wharves, berths, jetties, conveyors, loading/unloading facilities, barge facilities and tug boat mooring, related to core port activities are supported ■ Development in this precinct does not include recreational/community facilities such as marinas, boat ramps, etc. 	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation



Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain			<p>GPC LUP contains the preferred development intent below for the port operations support precinct</p> <ul style="list-style-type: none"> ■ This precinct includes port roads or resources corridors/conveyors, and other access areas, not otherwise included in a precinct above ■ This precinct also includes areas that may be required or are intended for the deposition, storage, dewatering, treatment and/or potential removal of dredged material plus hardstand and laydown areas ■ It also includes any additional Strategic Port Land not otherwise included in a precinct ■ In some precincts, in particular at the Wiggins Island and Fisherman's Landing localities, these areas may also represent sites for future industrial development subject to relevant and necessary environmental, planning and other feasibility studies <p>GPC LUP contains the preferred development intent below for the light industry and commercial precinct</p> <ul style="list-style-type: none"> ■ Light and/or commercial industry that complement or support port and industry activities are encouraged ■ This precinct provides a transition from high impact port activities in other nearby precincts to adjacent land uses outside the port area ■ Land in the precinct may also accommodate activities that have an 'interim' function in that the land is preserved by the port authority for future core/strategic needs but accommodates other activities in the short-medium term ■ Land in the precinct may also provide for light /commercial industry uses not directly related to port activities, however, the quantum of the activities must complement the local governments commercial outcomes in the relevant area ■ A diversity of economic activity and employment opportunities are encouraged 		

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain			<ul style="list-style-type: none"> ■ Land uses could include for example, processing, workshops etc. that support the core industries, which supply port development and construction activities, as well as have a wider commercial role ■ In the RG Tanna Coal Terminal locality, any development on Lot 211 on SP174655 must address the <i>Gladstone Power Station Agreement Act 1993</i> <p>GPC LUP contains the preferred development intent below for the buffer precinct</p> <ul style="list-style-type: none"> ■ Buffer precincts may be used to separate potentially incompatible port land use activities or may be used as part of the port's impact mitigation measures to separate port activities from surrounding sensitive land uses ■ The precinct may be used to preserve land for future port uses, therefore development on this land will be limited to ensure that it does not compromise the ability to use that land for port purposes in the future ■ Measures are to be taken to manage stormwater and minimise erosion <p>GPC issued development approvals over tenants, assessable against the GPC LUP and GPC Port Development Code</p> <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>		
Marine	Port Curtis within port limits	Not applicable	<p>GPC issued development approvals over SPL tidal area, assessable against the GPC LUP and GPC Development Code</p> <p>Commonwealth project approvals under the EPBC Act, Sea Dumping Act and others referred to Table 4.1</p> <p>State project approvals assessed under SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	Legislative approval conditions TI Act and SP Act or Planning Act and other relevant integrated legislation

Table 4.3 Strategic Port Land existing operational environmental management measures

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Marine industry and recreation	Gladstone Marina	Marine industry Park land and education	Water quality monitoring for the presence (based on Environmental Authority holder's determination) of <i>Escherichia coli</i> in the marina and reported with annual report	Annually	EP Act
			Environmental Management System (EMS) certified to ISO14001 (section being developed) EMS identifies risks associated with the aspects and impacts from various GPC activities and how they are managed to reduce any potential environmental risks) (refer marine precinct for further details on water quality monitoring and reporting)	Implemented on an ongoing basis	Voluntary
Interface	Hanson Road	Light industry and commercial	EMS certified to ISO14001 (section being developed)	Implemented on an ongoing basis	Voluntary
			EMS certified to ISO14001	Implemented on an ongoing basis	Voluntary
Port, industry and supply chain	South Trees and Boyne Wharf Port Central RG Tanna Coal Terminal Wiggins Island Fisherman's Landing Curtis Island	Port industry Wharves (offshore) Port operations support Marine industry Light industry and commercial Buffer	Site Based Management Plan (SBMP) Integrated Environmental Monitoring System (IEMS)	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Auditing of Environmental Authority and SBMP	Every two years	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Dust Management Plan and associated dust suppression measures	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain			Mass deposition rate of combustible materials (air quality measures)	Monthly	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Particulate matter less than 10µm in aerodynamic diameter (PM10) (air quality measures)	Continuously	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Total suspended particulate matter (air quality measures)	Monthly	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Mass deposition rate of insoluble solids, mass deposition rate of ash, mass deposition rate of total solids, combustible matter, compositional analysis (%) and particulate identification (air quality measures)	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Stormwater Management Plan Erosion and sediment controls	Twice yearly and when pH < 6.5	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Stormwater release points at six locations around the Barney Point Coal Terminal (ie dissolved oxygen, pH, suspended solids, and total petroleum hydrocarbons (TPH))	Continuously	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Ambient water monitoring must address water chemistry and biology of waters impacted by the activity (GPC does this through Port Curtis Integrated Monitoring Program (PCIMP) (http://pcimp.aims.gov.au/data/uid/5d8e2714-2147-4834-b278-65f12aa54e74))		

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain			Stormwater release points at five locations around RG Tanna (ie dissolved oxygen, pH, suspended solids, and TPH)	Once per stormwater discharge event	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Port Central water quality monitoring (ie dissolved oxygen, suspended solids, pH, oil and grease)	Upon discharge (up to four times/year)	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Noise monitoring	Complaint driven	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Acid sulfate soils (ASS) managed in accordance with GPC ASS and potential acid sulfate soils (PASS) and Contaminated Land EMP to prevent contaminants from being directly and indirectly released to waters Weed Management Plan Fauna Management Procedure Progressive rehabilitation Abrasive Blasting Management Plan	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Waste Management Plan and waste tracking certificates	Ongoing and has no lapsing of timeframe for implementation	TI Act and SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain			Community complaint responses in relation to dust and noise may trigger additional monitoring at the place of residence of the complainant	Complaint driven	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Annual reports, air quality compliance monitoring results and remedial actions taken to prevent or minimise dust emissions	Annually	TI Act and SP Act or Planning Act and other relevant integrated legislation
			National Greenhouse and Energy Reporting (NGER) and National Pollutant Inventory (NPI) reporting	Annually	<i>Environmental Protection Regulation 2008</i>
			Stormwater release points at five locations around RG Tanna Coal Terminal, including dissolved metals (ie Hg, Zn, Cu, Ag, Ni, Pb, Cr, Cd and Sulfate)	Undertaken when pH < 6.5	TI Act and SP Act or Planning Act and other relevant integrated legislation
			Shipping (ballast water and hull fouling) (not under GPC control) - wharf surveillance monitoring inspections conducted by AQIS. This is regulated by Australian Law and requires a written approval form	As required	PP Ships Act
			Groundwater monitoring at the Western Basin Reclamation Area	Monthly	Legislative approval condition
			Mangroves monitoring adjacent to the Western Basin Reclamation Area bund wall	Biannual, completion date October 2016	Legislative approval condition

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain			<p>Environmental Management System certified to ISO14001</p> <p>Light surveys</p> <p>Groundwater monitoring</p> <p>Stormwater sampling (non-compliance sites)</p> <p>Depositional dust (due diligence) sites</p> <p>Real time dust samplers, private weather stations and predictive weather</p> <p>Soil sampling</p> <p>Vector control (mosquitos)</p> <p>Ecotox testing sediment ponds (RG Tanna Coal Terminal)</p> <p>Bathometric surveys of sediment ponds (RG Tanna Coal Terminal)</p> <p>Reed bed trials (Barney Point)</p>	Implemented on an as needed basis	Voluntary
Marine	Port Curtis within port limits	Not applicable	<p>Long-term Monitoring and Management Plan for maintenance dredging and sea disposal (http://www.gpci.com.au/operations/dredging), including sediment quality, water quality, benthic habitat and communities, hydrographic survey and marine pest impacts</p> <p>Western Basin Dredging and Disposal Project Biodiversity Offset Strategy and Marine Fish Habitat Offset (http://www.westernbasinportdevelopment.com.au/)</p> <p>Ecological Research and Monitoring Program</p> <p>The Ecological Research and Monitoring Program (ERMP) (http://www.westernbasinportdevelopment.com.au/ermp). Funds projects to examine short, medium and long term impacts on a range of marine megafauna and plant life including Turtles, Inshore dolphins, Dugongs, Migratory Shorebirds, Mangroves and Seagrass meadows</p> <p>ERMP – Monitoring the survival and recovery of shorelines, specifically tidal wetlands (Mangroves/Saltmarsh/Saltpans)</p>	<p>1 December 2015 to 1 August 2018</p> <p>Completion in 2021</p> <p>Completion approximately 2020</p> <p>Annually until May 2021</p>	<p>Legislative approval condition</p> <p>Legislative approval condition</p> <p>Legislative approval condition</p> <p>Legislative approval condition</p>

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Marine			<p>ERMP – Dugong feeding ecology and habitat use (dugong feeding trail assessment)</p> <p>ERMP – Migratory Shorebird Monitoring: Understanding Ecological Impact</p> <p>ERMP – Migratory Shorebird Monitoring: Annual Summer Surveys</p> <p>ERMP – Increase understanding of the status of Australian snubfin and Australian humpback dolphins within Port Curtis and Port Alma</p> <p>ERMP – Monitoring of Marine Turtle Nesting Populations: Curtis Island and Peak & Avoid Islands</p> <p>ERMP – Green turtle tracking and habitat use in Port Curtis</p> <p>ERMP – Inter-nesting habitat use by flatback turtles off the Curtis Island coast</p> <p>ERMP – Monitoring Seagrass Seedbank Density and Viability within Port Curtis</p> <p>ERMP – Increase the understanding of the Green turtle Population in Port Curtis</p> <p>Western Basin Dredging and Disposal Project reports and approvals; (http://www.westernbasinportdevelopment.com.au/project_approvals_permits/section/documentation)</p> <p>Seagrass monitoring (quarterly)</p> <p>Seagrass monitoring (annual)</p> <p>Benthic Photosynthetically Active Radiation (PAR) Monitoring (quarterly)</p>	<p>Quarterly until February 2017</p> <p>Annually until January 2017</p> <p>Annually until March 2018</p> <p>Annually until June 2017</p> <p>Annually until November 2017</p> <p>Annually until May 2017</p> <p>Annually until November 2016</p> <p>Quarterly until June 2017</p> <p>Annually until June 2020</p> <p>Not applicable</p> <p>Quarterly until November 2016</p> <p>Annually until November 2018</p> <p>Quarterly until December 2016</p>	<p>Legislative approval condition</p>

Master planned area precinct	Locality name	GPC LUP precinct name	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Marine			<p>PCIMP (http://pcimp.aims.gov.au/data/uuid/5d8e2714-2147-4834-b278-65f12aa54e74)</p> <p>GHHP (http://ghhp.org.au/)</p> <p>Reef 2050 Integrated Monitoring and Reporting Program (RIMReP) Strategy (http://www.gbrmpa.gov.au/managing-the-reef/reef-2050/reef-integrated-monitoring-and-reporting-program)</p> <p>Seagrass Monitoring with James Cook University</p> <p>Turtle monitoring with EHP</p> <p>Wharf water quality (multiprobe - physico-chem analysers) (Fisherman's, Clinton and Boyne wharves)</p> <p>Spoil disposal ground sediment dynamics (ie particle size distribution and settlement rates, turbidity, BPAH, current and wave) (could potentially be done for the whole of Gladstone port in future)</p> <p>Bioaccumulation (spoil disposal ground)</p> <p>Marine pest surveys</p> <p>Sediment dynamics investigations with Central Queensland University</p>	Implemented on an ongoing and as needed basis	Voluntary

Table 4.4 Gladstone State Development Area Development Scheme existing statutory requirements and operational environmental management measures

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Environmental protection	Curtis Island	Curtis Island Environmental Management Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to recognise and protect environmental values, provide opportunities for rehabilitation and enhancement of existing environmental values and recognise and protect wetlands, vegetation and fauna habitats closely related to the Great Barrier Reef Marine Park and the GBRWHA ■ This precinct will provide areas for open space where remnant vegetation, wetlands, waterways and areas of ecological significance can remain and where revegetation can occur. This precinct provides opportunities for environmental offsets <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act



Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
<p>Port, industry and supply chain</p>	<p>Curtis Island</p>	<p>Curtis Island Industry Precinct</p>	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to accommodate high impact industrial development and special industrial development that is difficult to locate in conventional industrial estates, requires large land parcels and separation from sensitive receptors ■ Uses in this location have links to the port through the import or export of material and benefit from close proximity to port related infrastructure and services ■ Defined uses which are generally considered to meet the precinct intent include High Impact Industry and Special Industry ■ Linear infrastructure and other uses may also be supported where these require co-location with and do not compromise the uses generally considered to meet the precinct intent ■ Development within this precinct which is incompatible with, adversely affects or constrains existing or future LNG processing operations will not be supported ■ Development within this precinct must recognise the adjacent Curtis Island Environmental Management Precinct <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	<p>Not applicable</p>	<p>SDPWO Act</p>

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	Curtis Island and mainland	Materials Transportation and Services Corridor Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to provide an efficient and effective route for linear infrastructure to link infrastructure to industries within the GSDA and the Port of Gladstone. The precinct is to accommodate linear infrastructure such as gas transportation pipelines, potable and sea water pipelines, sewage pipelines and slurry pipelines, conveyors, rail lines, roads and haul roads. ■ Defined uses which are generally considered to meet the precinct intent include Linear Infrastructure Facility ■ Development within the precinct will: <ul style="list-style-type: none"> – Minimise construction and operation footprints and follow a logical sequence of development to maximise opportunities for future linear infrastructure – Minimise impacts on existing and future linear infrastructure – Provide access to the corridor for the construction, operation and maintenance of existing and future linear infrastructure – Be designed to coexist with other linear infrastructure – Recognise and protect cultural heritage values associated with the Mount Larcom Station Original Homestead Site on Lot 2 on SP147877 <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	Yarwun	Medium – High Impact and Port Related Industry Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to accommodate medium and high impact industrial development such as mineral and resource refining and processing, chemical and industrial material manufacturing, metal product manufacturing and processing, engineering works, storage of dangerous goods that require large land parcels. are difficult to locate in conventional industrial estates outside the GSDA and require separation from sensitive receptors ■ Uses in this location have links to the port through the import or export of material and benefit from close proximity to port related infrastructure and services ■ Defined uses which are generally considered to meet the precinct intent include High Impact Industry, Medium Impact Industry, Special Industry and Warehouse ■ Linear infrastructure and other uses may also be supported where these require co-location with and do not compromise the uses generally considered to meet the precinct intent ■ Road access to the precinct will be via: <ul style="list-style-type: none"> – Existing intersection – Hanson Road/Reid Road – Existing roundabout – Hanson Road/Rio Tinto Private Access – Landing Road <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	Callemondah and Targinnie	Low – Medium Impact Industry Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to accommodate low to medium impact industrial development such as warehousing, repairing and servicing, engineering works, assembling metal products and manufacturing that supports and complements industrial activities located within the GSDA ■ Defined uses which are generally considered to meet the precinct intent include Low Impact Industry, Medium Impact Industry and Warehouse ■ Linear infrastructure, Infrastructure Facility and other uses may also be supported where these require co-location with and do not compromise the uses generally considered to meet the precinct intent ■ Development within this precinct will recognise and protect cultural heritage values associated with the Targinnie Cemetery on Lot 95 on DS287 ■ Road access to this precinct will be via Targinnie Road for that part of the precinct which is north of the Materials Transportation and Services Corridor Precinct <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	Targinnie	Medium – High Impact Industry Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to accommodate medium and high impact industrial development such as boiler making or engineering works, storage of dangerous goods, food processing, manufacturing of wood, metal, glass, plastic, plastic products and workshops that require large land parcels, are difficult to locate in conventional industrial estates outside the GSDA and require separation from sensitive receptors ■ Defined uses which are generally considered to meet the precinct intent include High Impact Industry, Medium Impact Industry and Warehouse ■ Linear infrastructure and other uses may also be supported where these require co-location with and do not compromise the uses generally considered to meet the precinct intent ■ Road access to the precinct will be along either Cullens or Swan Road <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain		Medium Impact Industry Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ In the long term this precinct is to accommodate medium impact industrial development such as food processing and manufacturing. In the short to medium term rural and agricultural uses may be supported where they do not compromise existing or future industrial development in the GSDA. Rural and agricultural uses may also act as buffer areas to sensitive receptors external to the GSDA. This precinct provides opportunities for environmental offsets. ■ Defined uses which are generally considered to meet the precinct intent include Animal Husbandry, Animal Keeping, Aquaculture, Cropping, Low Impact Industry and Medium Impact Industry ■ Linear infrastructure and other uses may also be supported where these require co-location with and do not compromise the uses generally considered to meet the precinct intent ■ Development within this precinct will: <ul style="list-style-type: none"> – Consider public access to the foreshore – Recognise and protect the environmental values of drainage lines and their tributaries, and tidal land and vegetation – Provide appropriate physical separation between industrial activities within the GSDA and sensitive receptors external to the GSDA <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	Aldoga	High Impact Industry Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to accommodate high impact industrial development that is difficult to locate in conventional industrial estates such as: mineral and resource refining and processing, chemical and industrial material manufacturing, metal product manufacturing and processing, abattoir, rail dependant industries including rail marshalling yards, which require a very large land parcel and separation from sensitive receptors ■ Defined uses which are generally considered to meet the precinct intent include High Impact Industry, Infrastructure Facility, Rail Marshalling Yard and Special Industry ■ Linear infrastructure and other uses may also be supported where these require co-location with and do not compromise the uses generally considered to meet the precinct intent ■ Development within this precinct will recognise and protect the cultural heritage values associated with the Euroa Homestead on Lot 200 on SP239672 ■ Road access to this precinct will be via Aldoga Road, Cullens Road and Gladstone-Mt Larcom Road. Access from Gladstone-Mt Larcom Road to this precinct will be limited to three intersections at the following locations: <ul style="list-style-type: none"> - A proposed intersection approximately 3.8 km from Bruce Highway - A proposed intersection approximately 8.4 km from Bruce Highway (road/rail overpass) - The intersection with Aldoga Road <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Not applicable	SDPWO Act

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain		Waste Management Precinct	<p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p> <p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to accommodate waste management development such as residue storage facilities, waste disposal, recycling and waste incineration that require large land parcels that are isolated from sensitive receptors. High impact industrial development and rail marshalling yards may also be suitable in the west of the precinct ■ Defined uses which are generally considered to meet the precinct intent include High Impact Industry, Infrastructure Facility, Medium Impact Industry, Rail Marshalling Yard, Special Industry and Utility Installation ■ Linear infrastructure and other uses may also be supported where these require co-location with and do not compromise the uses generally considered to meet the precinct intent ■ Development within this precinct must recognise and protect the environmental values of Lot 87 on SP144431 ■ Road access to this precinct will be via the proposed extension to Aldoga Road <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	East End	Transport and Support Services Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to accommodate low impact industrial development such as warehousing, exploration and mining support services, machinery and equipment servicing, construction services, transport depot, distribution centre, contractors depot and storage yard and compliment the industrial activities located within the GSDA ■ Defined uses which are generally considered to meet the precinct intent include Low Impact Industry, Transport Depot and Warehouse ■ Linear infrastructure and other uses may also be supported where these require co-location with and do not compromise the uses generally considered to meet the precinct intent ■ Development within this precinct will recognise sensitive uses adjacent to the GSDA ■ Road access to the precinct will be via a maximum of two proposed access points: <ul style="list-style-type: none"> – Intersection on Gladstone-Mt Larcom Road, approximately 3.8 km east of the Bruce Highway – Intersection on the proposed extension to Aldoga Road <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act

Master planned area precinct	Locality	GSDA Development Scheme development precinct	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	West Stowe	Separation Precinct	<p>Development Scheme contains the preferred development intent below.</p> <ul style="list-style-type: none"> ■ This precinct is to provide appropriate separation between industrial activities within the GSDA and sensitive receptors outside the GSDA ■ Development, including rural and agricultural development may be appropriate where it is largely unobtrusive in nature, and has no adverse impacts on sensitive receptors located outside the GSDA and does not compromise existing or future industrial development within the GSDA ■ Defined uses which are generally considered to meet the precinct intent include Animal Husbandry, Animal keeping and Cropping <p>Material change of use (excluding ERAs) and operational works for the clearing of native vegetation, and other development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development</p> <p>General environmental impacts are addressed under Section 2.5 (assessment criteria) of the GSDA Development Scheme and incorporated into Schedule 3 (where self-assessable development)</p>	Not applicable	SDPWO Act

Table 4.5 Gladstone Regional Council area existing statutory requirements and operational environmental management measures

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Environmental protection	Facing Island (excluding township) and Curtis Island	Special purpose ¹	Development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development	Not applicable	Not applicable
	Gatcombe Heads, Farmers Point and Northcliffe on Facing Island)	Township	Development assessable under GRC Planning Scheme with the key relevant provisions including: <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Our rural and coastal townships and places’ theme ■ Township Zone Code, Development Design Code, Home Base Business Code, and various Overlay, Use and Development Codes Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Special purpose ¹	Development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development	Not applicable	Not applicable
		Open space	Development assessable under GRC Planning Scheme with key relevant provisions including: <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Our environment and heritage’ theme ■ Open Space Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Environmental protection		Community facilities	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Building it better: our urban areas’ theme Community Facilities Zone Code, Development Design Code, Landscaping Code, and various Overlay and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
	Inshore islands	Environmental management	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Our environment and heritage’ theme Environmental Management Zone Code, Development Design Code, Home Based Business Code and various Overlay Codes and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Major tourism (southern portion of Quoin Island only)	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Gateway to the world’ theme Major Tourism Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes. <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Environmental protection		Conservation (Camp Island only)	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Our environment and heritage’ theme Conservation Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
	Mount Larcom (landform)	Rural	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Our rural and coastal townships and places’ theme Rural Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
Marine industry and recreation	SPL	Special purpose ¹	Development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development	Not applicable	Not applicable
	Gladstone Central areas outside SPL	Medium impact industry	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes ‘Gateway to the world’ theme Medium Impact Industry Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes. <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Marine industry and recreation		Low impact industry	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes 'Gateway to the world' theme ■ Low Impact Industry Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Sport and recreation	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes ' Sport and Recreation Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes. <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Open space	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes – 'Our environment and heritage' theme ■ Open Space Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Interface	Barney Point	Medium density residential	Development assessable under GRC Planning scheme with key relevant provisions including: <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Community living’ theme Medium Density Residential Zone code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Special purpose (Lot 4 on SP196868 only)	Development assessable under GRC Planning scheme with key relevant provisions including: <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Gateway to the world’ theme Special Purpose Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Special purpose’ (Lot 3 on SP196868 only)	Development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development	Not applicable	Not applicable
		Low impact industry	Development assessable under GRC Planning scheme with key relevant provisions including: <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Gateway to the world’ theme Low Impact Industry Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Interface		Open space	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Our environment and heritage’ theme Open Space Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
	Gladstone Central	Medium density residential	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Community living’ and ‘Building it Better: Our Urban Areas’ themes Open Space Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Special purpose (adjoining Flinders Parade)	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Gateway to the world’ theme Special Purpose Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Special purpose ¹ (Lot 123 SP132828 only)	Development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development	Not applicable	Not applicable

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Interface		Open space	Development assessable under GRC Planning scheme with key relevant provisions including: <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Our environment and heritage’ theme Open Space Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
Port, industry and supply chain	SPL	Special purpose	Development controlled under GPC LUP, SP Act or Planning Act and relevant integrated legislation applicable to development	Not applicable	Not applicable
	GSDA	Special purpose	Material change of use controlled under the GSDA Development Scheme, SP Act or Planning Act and relevant integrated legislation applicable to development	Not applicable	Not applicable
		Low impact industry	Development assessable under GRC Planning scheme with key relevant provisions including: <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Gateway to the world’ theme Low Impact Industry Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	Barney Point areas outside of SPL and GSDA Development Scheme)	Low-medium density residential	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Community living’ and ‘Building it better- our urban areas’ themes Low-Medium Density Residential Zone Code, Development Design Code, Home Based Business Code, Landscaping Code, and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Open space	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Our environment and heritage’ theme Open Space Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
	South Trees areas outside of SPL and GSDA Development Scheme	Special industry	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Gateway to the world’ theme Special Industry Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain		Limited development (constrained land)	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Major Industry Buffer Precinct ■ Strategic framework and outcomes – ‘Our environment and heritage’ theme ■ Limited Development Zone Code, Development Design Code, Home Based Business Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Special purpose	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Gateway to the world’ theme ■ Special Purpose Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Open space	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Our environment and heritage’ theme ■ Open Space Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain	Callemondah and Byellee areas outside of SPL and GSDA Development Scheme	Special industry	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Gateway to the world’ theme ■ Special Industry Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Medium Impact Industry (including Red Rover Industrial Precinct)	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Gateway to the world’ theme ■ Medium Impact Industry Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Limited development (constrained land)	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Major Industry Buffer Precinct ■ Strategic framework and outcomes – ‘Our environment and heritage’ theme ■ Limited Development Zone Code, Development Design Code, Home Based Business Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain		Special purpose	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Gateway to the world’ theme ■ Special Purpose Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Conservation	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Our environment and heritage’ theme ■ Conservation Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes. <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Environmental management	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> ■ Strategic framework and outcomes – ‘Our environment and heritage’ theme ■ Environmental Management Zone Code, Development Design Code, Home Based Business Code and various Overlay Codes and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain		Rural	<p>Development assessable under GRC Planning Scheme with the key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Our rural and coastal townships and places’ theme Rural Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes. <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
		Open space	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Our environment and heritage’ theme Open Space Zone Code, Development Design Code, Landscaping Code, and various Overlay, Use and Development Codes <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation
	Yarwun areas outside of SPL and GSDA Development Scheme)	Special industry	<p>Development assessable under GRC Planning scheme with key relevant provisions including:</p> <ul style="list-style-type: none"> Strategic framework and outcomes – ‘Gateway to the world’ theme Special Industry Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Code <p>Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development</p>	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation



Master planned area precinct	Locality	Zoning	Existing statutory requirements and operational environmental management measures	Applicable timeframe for implementation	Statutory mechanism or voluntary
Port, industry and supply chain		Rural	Development assessable under GRC Planning Scheme with the key relevant provisions including: <ul style="list-style-type: none">■ Strategic framework and outcomes – ‘Our rural and coastal townships and places’ theme■ Rural Zone Code, Development Design Code, Landscaping Code and various Overlay, Use and Development Codes Development assessable under SP Act or Planning Act and relevant integrated legislation applicable to development	Ongoing and has no lapsing of timeframe for implementation	SP Act or Planning Act and other relevant integrated legislation

Table note:

1. The special purpose zone in this locality under the GRC Planning Scheme relates to SPL



5 Risk assessment for growth scenarios

5.1 Risk assessment for growth scenario 1

Description and overall assumptions:

- There is very limited economic growth globally, as well as limited growth across the State and the Gladstone region
- Growth is within capacity of existing facilities
- There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions
- There is no expansion of coal terminal capacity
- There is minimal new industrial development
- There is limited project-related capital dredging undertaken at the Port of Gladstone
- Price of coal remains weak (recognising there is uncertainty about the future of coal)
- The main shipping channel is not duplicated
- Continuation of cruise shipping
- Maximum port throughput of 151 mtpa

Table 5.1 Industry throughput (maximum), assumptions and implications for growth scenario 1

Industry type	Maximum throughput	Assumptions	Implications
Coal	102 mtpa	<ul style="list-style-type: none"> ■ Demand for coal does not increase ■ Surat Basin mines are not developed ■ Surat Basin rail is not developed ■ There is no expansion of coal terminal capacity: <ul style="list-style-type: none"> – RG Tanna coal terminal capacity remains at 75 mtpa – Future stages of WICT are not constructed, and the capacity of the terminal remains at 27 mtpa – Barney Point does not operate as a coal terminal 	<ul style="list-style-type: none"> ■ No additional coal facilities to be developed ■ Actual throughput may be significantly less than maximum
LNG	25 mtpa	<ul style="list-style-type: none"> ■ Supply and demand for LNG remains stable ■ There is no expansion of LNG capacity (APLNG - 2 trains, 9 mtpa; GLNG - 2 train, 8 mtpa; QCLNG - 2 trains, 8 mtpa) 	<ul style="list-style-type: none"> ■ No additional LNG trains developed ■ Surplus infrastructure following LNG construction activities (eg laydown areas/warehousing/workforce accommodation)
Bauxite Alumina Aluminium	16 mtpa	<ul style="list-style-type: none"> ■ Demand for alumina/aluminium decreases due to a downturn in the global economy ■ One of Gladstone's two alumina refineries closes. Remaining capacity in Gladstone for alumina/aluminium is approximately 4 mtpa ■ The supply of bauxite decreases to 12 mtpa in-line with the reduced refining capacity (based on approximate 3:1 ratio of bauxite imports to alumina/aluminium exports, as per 2013/14 trade figures) 	<ul style="list-style-type: none"> ■ Opportunities for future redevelopment ■ Potential road network upgrades required
Other existing commodities and new industries	8 mtpa	<ul style="list-style-type: none"> ■ The amount of other existing commodities (eg ammonium nitrate, magnesia, grain, limestone, petroleum coke) and general cargo (including containers) being imported/exported remains stable ■ New industries are developed in the area to take advantage of lower entry costs eg waste management, gas-fired power, chemicals manufacture, meat processing ■ There is some use of the port by the cruise shipping industry 	<ul style="list-style-type: none"> ■ Existing supply chain infrastructure is adequate ■ No additional major infrastructure required at the port ■ Use of Barney Point Terminal for bulk commodities other than coal
Total maximum throughput	151 mtpa		



5.2 Risk assessment for growth scenario 2

Description and overall assumptions:

- There is global economic growth, as well as growth across the State and the Gladstone region
- There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions
- Potential for technological change to enable ongoing thermal coal due to lower emissions.
- Strong price growth for relevant commodities
- New major industries would be developed within the master planned area
- Limited duplication of the port's shipping channels and associated dredged material placement
- Capital dredged material from the Gatcombe and Golding channel duplication, Targinnie Channel and the Clinton Bypass is beneficially reused or placed onshore
- Continuation of cruise shipping
- Maximum port throughput of 230 mtpa

Table 5.2 Industry throughput (maximum), assumptions and implications for growth scenario 2

Industry type	Maximum throughput	Assumptions	Implications
Coal	135 mtpa	<ul style="list-style-type: none"> ■ Demand for coal increases slightly ■ Surat Basin mines are not developed ■ Surat Basin rail is not developed ■ There is some expansion of coal terminal capacity: <ul style="list-style-type: none"> – RG Tanna coal terminal continues to operate and Stage 2 of WICT is constructed – Barney Point does not operate as a coal terminal 	<ul style="list-style-type: none"> ■ Expansion of coal terminal capacity will take place only at WICT - additional coal terminals will not be required ■ Additional berths may be required which would involve additional dredging (could be more than one million cubic metres)
LNG	40 mtpa	<ul style="list-style-type: none"> ■ Supply and demand for LNG increases ■ The existing LNG plants are operating at maximum capacity (based on approvals: APLNG - 4 trains, 18 mtpa; GLNG - 3 trains, 10 mtpa; QCLNG - 3 trains, 12 mtpa) 	<ul style="list-style-type: none"> ■ Additional trains may be required at the existing plants ■ Two additional berths may be required which would involve additional dredging ■ Surplus infrastructure following LNG construction activities (eg laydown areas/warehousing/workforce accommodation)
Bauxite Alumina Aluminium	40 mtpa	<ul style="list-style-type: none"> ■ Demand for alumina/aluminium increases ■ The supply of bauxite increases: <ul style="list-style-type: none"> – The South of the Embley project delivers 50 mtpa of bauxite (as per EIS report), of which approximately half is sent to Gladstone (25 mtpa) – The Aurukun project delivers approximately 5 mtpa of bauxite (as per EIS report), all of which is sent to Gladstone ■ Refining processes continue at Gladstone and refineries and smelters are built or expanded as required ■ 10 mtpa of alumina/aluminium is exported through the port (based on approximate 3:1 ratio of bauxite imports to alumina/aluminium exports, as per 2013/14 trade figures) 	<ul style="list-style-type: none"> ■ An additional refinery will need to be constructed in the master planned area, even if the existing refineries are expanded to maximum capacity ■ An additional smelter may be required ■ Tighter emission controls ■ Additional energy supply may be required ■ Additional residue storage facilities may be required ■ Two additional wharves and berths may be required which would involve additional dredging ■ Beneficial reuse or land disposal of dredge spoil will be required
Other existing commodities and new industries	15 mtpa	<ul style="list-style-type: none"> ■ The amount of other existing commodities (eg ammonium nitrate, magnesia, grain, limestone, petroleum coke) and general cargo (including containers) being imported/exported increases, but remains a relatively small proportion of overall trade ■ New industries (eg steel plant, nickel refinery, fertilizer manufacture, fuel refinery, oil shale) are developed in the area and new commodities are traded through the port ■ There is some use of the port by the cruise shipping industry 	<ul style="list-style-type: none"> ■ No major port infrastructure required, however capital dredging is likely ■ Use of Barney Point for bulk commodities other than coal ■ Further development of Fisherman's Landing expansion area ■ Potential road network upgrades required ■ May require a purpose built terminal for cruise shipping
Total maximum throughput	230 mtpa		



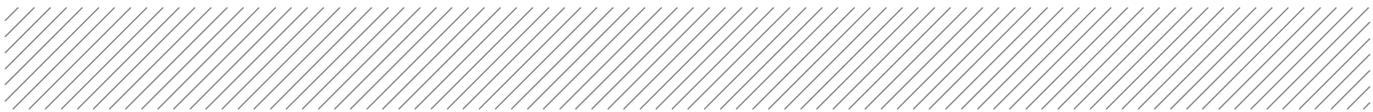
5.3 Risk assessment for growth scenario 3

Description and overall assumptions:

- There is significant global economic growth, as well as growth across the State and the Gladstone region
- There is a global shift away from the use of coal, and toward lower carbon intensive and renewable sources of energy to achieve improved emissions
- Potential for technological advances to enable ongoing demand for thermal coal due to lower emissions
- Growth of coal exports supported by development of the Surat Basin linked to the Port of Gladstone by the Surat Basin Railway
- New major industries developed within the master planned area
- Significant development at Fisherman's Landing expansion and Hamilton Point and road and rail connection from Curtis Island to mainland instead of additional dredging
- Strong price growth for relevant commodities
- Duplication of shipping channels and associated dredge material placement
- Capital dredged material from the Gatcombe and Golding channel duplication, Targinnie Channel and the Clinton Bypass is beneficially reused or placed onshore
- Continuation of cruise shipping
- Maximum port throughput of 294 mtpa

Table 5.3 Industry throughput (maximum), assumptions and implications for growth scenario 3

Industry type	Maximum throughput	Assumptions	Implications
Coal	164 mtpa	<ul style="list-style-type: none"> Demand and supply for coal increases Surat Basin mines are operational Surat Basin rail is operational RG Tanna coal terminal is operating at its full capacity (80 mtpa) Wiggins Island Coal Terminal (WICT) is fully constructed and operating at full approved capacity (84 mtpa, as per EIS report) Barney Point does not operate as a coal terminal but is used for other bulk commodities 	<ul style="list-style-type: none"> Expansion of coal terminal capacity will take place only at WICT and RG Tanna – additional coal terminals will not be required Additional berth may be required which would involve additional dredging
LNG	50 mtpa	<ul style="list-style-type: none"> Demand and supply for LNG increases The existing LNG plants are operating at maximum capacity (based on approvals: APLNG—4 trains, 18 mtpa; GLNG—3 trains, 10 mtpa; QCLNG—3 trains, 12 mtpa) An additional LNG plant is constructed with a capacity of 10 mtpa 	<ul style="list-style-type: none"> Additional trains required at the existing plants 2-3 additional berths may be required which would involve additional dredging Beneficial reuse or land disposal of dredge spoil will be required Development requires large module/equipment to be transported to the port
Bauxite Alumina Aluminium	40 mtpa	<ul style="list-style-type: none"> Demand for alumina/aluminium increases The supply of bauxite increases <ul style="list-style-type: none"> The South of the Embley project delivers 50 mtpa of bauxite, of which approximately half is sent to Gladstone (25 mtpa) The Aurukun project delivers approximately 5 mtpa of bauxite, all of which is sent to Gladstone Refining processes continue at Gladstone and new refineries and smelters are built or existing expanded as required 10 mtpa of alumina/aluminium is exported through the port (based on approximate 3:1 ratio of bauxite imports to alumina/ aluminium exports, as per 2013/14 trade figures) 	<ul style="list-style-type: none"> An additional refinery will need to be constructed in the master planned area, even if the existing refineries are expanded to maximum capacity An additional smelter may be required Additional residue storage facilities may be required Development requires large module/equipment to be transported through the port Additional energy supply may be required Two additional wharves and berths may be required which would involve additional dredging Beneficial reuse or land disposal of dredge spoil will be required
Other existing commodities and new industries	40 mtpa	<ul style="list-style-type: none"> The amount of other existing commodities (eg ammonium nitrate, magnesia, grain, limestone, petroleum coke) and general cargo (including containers) being imported/exported increases New industries (eg steel plant, nickel refinery, fertilizer manufacture, fuel refinery, oil shale) are developed in the area and new commodities are traded through the port There is increased development of industries supporting the resources sector New port facilities are developed at Hamilton Point on Curtis Island There is increased use of the port by the cruise shipping industry 	<ul style="list-style-type: none"> Additional wharves and berths will be required which would involve additional capital dredging Channel duplication required involving additional capital and maintenance dredging Beneficial reuse or land disposal of dredge spoil will be required in expanded and/or new reclamation areas Increased use of Barney Point for bulk commodities other than coal Potentially additional major infrastructure including road and rail connection between Hamilton Point and the mainland Potential for infrastructure corridors (eg under harbour pipelines to Curtis Island, Hamilton Point and/or Tide Island) Further development of Fisherman's Landing expansion area. Potential road network upgrades required A cruise terminal for cruise shipping may be established at Auckland Point Construction activities may require large module/equipment to be transported through the port
Total maximum throughput	294 mtpa		



5.4 Proposed environmental management framework objectives for the management of potential impacts

The proposed EMF objectives for managing the potential impacts on the identified environmental values as a result of development within the master planned area, based on the proposed precincts, are provided below.

5.4.1 Port, industry and supply chain precinct

- To manage development impacts on the OUV of the GBRWHA and other environmental values below to as low as practically possible
 - Threatened ecological communities listed under the EPBC Act
 - Endangered and Of concern Regional Ecosystems listed under the VM Act
 - Conservation significance flora species and fauna species habitat listed under the EPBC Act and NC Act
 - Migratory shorebird habitat and populations
 - Natural scenic amenity values of the coastal zone
 - Cultural heritage values
- To increase the understanding of the presence and habitat value for EPBC Act and NC Act conservation significant fauna species and migratory species listed under the EPBC Act
- To maintain appropriate access to areas that provide Indigenous cultural heritage values and natural scenic amenity values to residents, recreational users and tourists that contribute towards the OUV of the GBRWHA
- To manage development impacts on cultural heritage and social values

5.4.2 Marine industry and recreation precinct

- To manage and mitigate development impacts on the OUV attributes of the GBRWHA and other environmental values below to as low as practically possible
 - Threatened ecological communities 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
- To maintain safe access to the waterfront and harbour for commercial operations, residents, recreational users and tourists

5.4.3 Interface precinct

- To ensure the design of residential development incorporates design measures and other controls that minimise noise, light, visual amenity and air quality impacts from adjoining port and industrial land uses

5.4.4 Environmental protection precinct

- To minimise potential direct disturbance and indirect impacts from development on the following Facing Island OUV attributes of the GBRWHA:
 - Marine turtle nesting beaches
 - Threatened ecological communities under the EPBC Act
 - Endangered and Of concern Regional Ecosystems under the VM Act
 - Conservation significant fauna habitat
 - Island vegetation and fauna species diversity
 - Dune systems and beaches
- To minimise potential direct disturbance and indirect impacts from development on the following Curtis Island environmental protection precinct OUV attributes of the GBRWHA:
 - Threatened ecological communities under the EPBC Act
 - Endangered and Of concern Regional Ecosystems under the VM Act
 - Conservation significant fauna habitat
 - Island vegetation and fauna species diversity
- To minimise and mitigate direct and indirect development impacts on the following inshore island and Mount Larcom landform OUV attributes of the GBRWHA and/or other environmental values:
 - Threatened ecological communities under the EPBC Act
 - Endangered and Of concern Regional Ecosystems under the VM Act
 - Conservation significance flora species and fauna species habitat under the EPBC Act and NC Act
 - Cultural heritage values
 - Natural scenic amenity values
- To increase the understanding of the presence and habitat value for EPBC Act, Fisheries Act and NC Act conservation significant flora and fauna species
- To limit future development to low impact recreational and nature-based activities or essential infrastructure with community benefit that does not reduce the OUV of the GBRWHA and other environmental values
- To maintain appropriate access to areas that provide Indigenous cultural heritage values and natural scenic amenity values to residents, recreational users and tourists that contribute towards the OUV of the GBRWHA

5.4.5 Marine precinct

- Where practical to protect the OUV attributes of the GBRWHA below from direct disturbance from development
 - 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
- Kangaroo Island wetland and important shorebird roosting habitat at Friend Point, North Passage and South Passage Islands, Boyne Island Beach, shorebird habitat associated Curtis Island, Facing Island and the other inshore islands
- To minimise and mitigate direct and indirect development impacts on the following OUV attributes of the GBRWHA and other environmental values:
 - Pelican Banks North, Pelican Banks South, Facing Island and Quoin Island seagrass meadows and deep water seagrass meadows
 - Mangroves and other intertidal 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
- To increase the understanding of the presence and habitat value for EPBC Act and NC Act conservation significant fauna species
- To continue to collect water quality information that monitors changes to the water quality and confirms the associated impact on the OUV attributes of the GBRWHA and other environmental values
- To maintain port access to and continued development of shipping channels and waterside areas in a manner that appropriately balances commercial, recreational and cultural activities and potential impacts on OUV attributes of the GBRWHA and other environmental values
- Maintain and manage OUV attributes of the GBRWHA and other environmental values currently expressed within this precinct

5.5 Summary of potential impacts for each precinct

For the purposes of the risk assessment for the growth scenarios some of the OUV and other environmental values have been grouped into categories for the purposes of defining potential impacts in Table 5.6. These categories or groupings are defined in Table 5.4.

Table 5.4 Definition of terms used to group values into categories appropriate for risk assessment

Term	Definition
Terrestrial flora species and/or communities	Threatened flora species, Regional Ecosystems, and/or threatened ecological communities occurring in terrestrial areas (ie does not include intertidal areas)
Intertidal flora species and/or communities	Regional Ecosystems containing mangroves, intertidal seagrass, threatened ecological communities inhabiting the intertidal zone (ie coastal saltmarsh communities)
Terrestrial fauna and/or habitat	All terrestrial fauna species, including threatened species, and their habitat
Intertidal fauna and/or habitat	Species inhabiting the intertidal zone for all or part of their life cycle, including shorebirds, juvenile fish species and macroinvertebrates
Marine fauna and/or habitat	Megafauna, reptiles (eg marine turtles), fish and nekton (excludes benthic communities and intertidal fauna)
Benthic communities (sub-tidal)	Sub-tidal and deep water seagrass meadows, macroalgae, macroinvertebrates and other flora and fauna species which inhabit benthic substrates
Cultural heritage and community values	Indigenous and non Indigenous cultural heritage sites, areas and values

Table 5.5 provides a summary of the potential impacts that may occur during the life of the master plan (ie to 2050) based on the three growth scenarios for the priority Port of Gladstone.

Table 5.5 Summary of the relevant potential impacts within each of the master planned precincts

Potential impacts	Relevance to the precinct (yes/no)				
	EPP	MIRP	IP	PISCP	MP
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	Yes	No
Direct mortality and/or injury to terrestrial fauna	Yes	No	No	Yes	No
Increase in noise, vibration, light and/or other disruption to behaviour/life-cycle of terrestrial fauna	Yes	Yes	No	Yes	Yes
Disruption to terrestrial fauna behaviour and/or life-cycle due to increased potential for human interaction	Yes	No	No	No	No
Increase in operational lighting impacting on terrestrial fauna	Yes	Yes	No	Yes	No
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
Increased levels of waste materials resulting in reduced terrestrial fauna habitat condition and/or quality	Yes	No	No	No	No
Increased edge effects on adjacent terrestrial vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments	Yes	Yes	No	Yes	No
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

Potential impacts	Relevance to the precinct (yes/no)				
	EPP	MIRP	IP	PISCP	MP
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
Direct mortality and/or injury to intertidal fauna	Yes	Yes	No	Yes	Yes
Increase in noise, vibration, light and/or other disruption to behaviour/life-cycle of intertidal fauna	Yes	Yes	No	Yes	Yes
Disruption to intertidal fauna behaviour and/or life-cycle due to increased potential for human interaction	Yes	Yes	No	No	No
Increase in operational lighting impacting on intertidal fauna	Yes	Yes	No	Yes	Yes
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
Increased levels of waste materials resulting in reduced intertidal fauna habitat condition and/or quality	Yes	Yes	No	No	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
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
Increased edge effects and/or direct loss of important foraging/roosting habitat for shorebirds	Yes	Yes	No	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	No	No	Yes	Yes
Direct mortality and/or injury to marine fauna	No	Yes	No	No	Yes
Increase in noise, vibration, light and/or other disruption to behaviour/life-cycle of marine fauna	No	Yes	No	Yes	Yes
Increase in operational lighting impacting on marine fauna	Yes	Yes	No	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
Increased edge effects on adjacent marine vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments	No	No	No	Yes	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	No	No	Yes	Yes
Increased edge effects on important nesting habitat for marine turtles	Yes	No	No	No	No
Beneficial impact that increases the opportunities for establishment of benthic communities and associated marine fauna	No	No	No	No	Yes

Potential impacts	Relevance to the precinct (yes/no)				
	EPP	MIRP	IP	PISCP	MP
Water quality impacts					
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
Sedimentation and decreased water quality in intertidal and/or marine areas resulting in decreased condition and/or quality of environments	Yes	Yes	No	Yes	Yes
Alteration of groundwater levels and quality resulting in impacts to surrounding terrestrial environments	Yes	Yes	No	Yes	Yes
Alteration of groundwater levels and quality resulting in impacts to surrounding intertidal environments	Yes	Yes	No	Yes	Yes
Alteration of groundwater levels and quality resulting in impacts to surrounding marine environments	Yes	Yes	No	Yes	Yes
Changes to marine water velocities and potential erosion, sedimentation and decreased water quality impacts resulting in decreased condition and/or quality	No	No	No	Yes	Yes
Social and cultural heritage impacts					
Decrease in visual amenity for residents, recreational users and tourists	Yes	Yes	No	Yes	Yes
Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	Yes	Yes	No	Yes	Yes
Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure	Yes	No	No	Yes	Yes
Increased dust impacts in surrounding areas resulting in reduced air quality	Yes	Yes	Yes	Yes	Yes
Access impacts on residents and tourists	Yes	No	No	No	No
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
Beneficial impact from an increase in public awareness of the OUV of the GBRWHA and other environmental values	Yes	No	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 supply chain precinct	No	No	Yes	No	No
Increased dust impacts in adjacent areas resulting in reduced air quality and/or increased odour impacts	No	No	Yes	No	No
Increase in pressure on community infrastructure and services (eg airport; health and emergency services; food, water and electricity supply)	Yes	No	No	Yes	No
Increase in demand for rental/sale properties which may result in decrease in housing affordability if the demand exceeds the supply of housing	No	No	No	Yes	No



Potential impacts	Relevance to the precinct (yes/no)				
	EPP	MIRP	IP	PISCP	MP
Decrease in social/community cohesion due to influx of temporary workforce, potentially leading to increased social and health related issues	No	No	No	Yes	No

Table notes:

Precincts: EPP = Environmental protection precinct
MIRP = Marine industry and recreation precinct
IP = Interface precinct
PISCP = Port, industry and supply chain precinct
MP = Marine precinct

5.6 Potential impacts and risk assessment for growth scenarios

Table 5.6 presents the potential impacts and risk assessments for all three growth scenarios, and provides a brief description of the management measures relevant to each potential impact.

Activities within the: Environmental protection precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.5 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk
					Scenario 1	Scenario 2	Scenario 3
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with the construction/expansion of trails, boardwalks and visitor centres	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and/or fauna habitat associated with Mount Larcom Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas of Mount Larcom Direct mortality and/or injury to terrestrial fauna at Mount Larcom (eg vehicle or machinery strike, clearing activities) Increased edge effects on adjacent terrestrial vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments associated with Mount Larcom Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or fauna habitat associated with Mount Larcom Sedimentation and decreased water quality in terrestrial areas resulting in decreased condition and/or quality of environments associated with Mount Larcom and downstream areas	X	<ul style="list-style-type: none"> GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures NC Act approval requiring EVMP and other measures 	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = U
					Negligible S = VH M = N C = L L = R	Negligible S = VH M = N C = L L = R	Negligible S = VH M = N C = L L = R
					No	No	No
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and intertidal environments on Curtis Island, Facing Island and/or other inshore islands Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial environments associated with Mount Larcom	Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial environments associated with Mount Larcom	✓	As above	Negligible S = H M = N C = L L = R	Negligible S = H M = N C = L L = R	Negligible S = H M = N C = L L = R
					Negligible S = VH M = N C = L L = R	Negligible S = VH M = N C = L L = R	Negligible S = VH M = N C = L L = R
					No	No	No
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance on Facing Island (for SPL area) Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure on Facing Island (for SPL area) and/or other inshore islands Direct impacts on cultural heritage sites during vegetation clearing and land disturbance on Curtis Island, Facing Island (for non SPL areas) and/or other inshore islands Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure on Curtis Island, Facing Island (for non SPL areas) and/or other inshore islands	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance on Facing Island (for SPL area) Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure on Facing Island (for SPL area) and/or other inshore islands Direct impacts on cultural heritage sites during vegetation clearing and land disturbance on Curtis Island, Facing Island (for non SPL areas) and/or other inshore islands Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure on Curtis Island, Facing Island (for non SPL areas) and/or other inshore islands	✓	<ul style="list-style-type: none"> GPC LUP for SPL on Facing Island and other relevant integrated legislation requiring EVMP and other measures GPC Cultural Heritage Protocol Curtis Island GSDA Environmental Management Precinct LMP GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures ACH Act and CHMP and/or Indigenous land use agreement 	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = U
					Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = U
					No	No	No

Activities within the: Environmental protection precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.5 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk
					Scenario 1	Scenario 2	Scenario 3
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with the construction/expansion of trails, boardwalks and visitor centres	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance associated with Mount Larcom Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure associated with Mount Larcom	X	<ul style="list-style-type: none"> GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures ACH Act and CHMP and/or Indigenous land use agreement 	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Low S = H M = L C = H L = R
					High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = H M = L C = M L = P
					High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = H M = L C = M L = P
Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion of recreational infrastructure	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion of recreational infrastructure	Increase in noise, vibration, light and/or other disruption to behaviour/life-cycle of terrestrial and intertidal fauna on Curtis Island, Facing Island and/or other inshore islands Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat on Curtis Island, Facing Island and/or other inshore islands Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats on Curtis Island, Facing Island and/or other inshore islands Increased edge effects on important nesting habitat for marine turtles and/or foraging/roosting habitat for shorebirds on Curtis Island, Facing Island and/or other inshore islands Sedimentation and decreased water quality in terrestrial and marine areas resulting in decreased condition and/or quality of environments associated with Curtis Island, Facing Island and/or other inshore islands and surrounding marine waters	✓	<ul style="list-style-type: none"> GPC LUP for SPL on Facing Island GRC PS for island areas outside SPL and GSDA Curtis Island GSDA Environmental Management Precinct LMP Development approval under SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures NC Act approval requiring EVMP and other measures 	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U
					High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U
					High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U
Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna associated with Mount Larcom Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or fauna habitat associated with Mount Larcom Increase in dust impacts on adjacent terrestrial vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats associated with Mount Larcom Increased dust impacts in surrounding areas resulting in reduced air quality Access impacts on residents and tourists	Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna associated with Mount Larcom Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or fauna habitat associated with Mount Larcom Increase in dust impacts on adjacent terrestrial vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats associated with Mount Larcom Increased dust impacts in surrounding areas resulting in reduced air quality Access impacts on residents and tourists	<ul style="list-style-type: none"> GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures NC Act approval requiring EVMP and other measures GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures As above 	X	<ul style="list-style-type: none"> GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures NC Act approval requiring EVMP and other measures GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures As above 	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Low S = H M = L C = M L = U
					Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Low S = H M = L C = M L = U
					Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Low S = H M = L C = M L = U

Activities within the: Environmental protection precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.5 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk
					Scenario 1	Scenario 2	Scenario 3
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion of recreational infrastructure	Sedimentation and decreased water quality in terrestrial areas resulting in decreased condition and/or quality of environments associated with Mount Larcom and downstream areas	X	As above	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA
		Alteration of groundwater quality as a result of construction activities (eg spills) associated with Curtis Island, Facing Island and/or other inshore islands	✓	As above	Negligible S = VH M = N C = L L = R	Negligible S = VH M = N C = L L = R	NA
		Alteration of groundwater quality as a result of construction activities (eg spills) associated with Mount Larcom	X	As above	Negligible S = H M = N C = L L = R	Negligible S = H M = N C = L L = R	NA
Increased and improved resident and tourist access to areas of environmental value	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent precincts and surrounding areas as a result of operation and maintenance of recreational infrastructure	Beneficial impact from an increase in public awareness of the OUV of the GBRWHA and other environmental values	✓	<ul style="list-style-type: none"> Curtis Island GSDA Environmental Management Precinct LMP 	NA	NA	NA
		Increase in operational lighting impacting on terrestrial, intertidal, and/or marine fauna on Curtis Island, Facing Island and/or other inshore islands	✓	<ul style="list-style-type: none"> GPC LUP for SPL on Facing Island 	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat on Curtis Island, Facing Island and/or other inshore islands		<ul style="list-style-type: none"> GRC PS for island areas outside SPL and GSDA 	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U
Increased and improved resident and tourist access to areas of environmental value	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent precincts and surrounding areas as a result of operation and maintenance of recreational infrastructure	Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna on Curtis Island, Facing Island and/or other inshore islands	✓	<ul style="list-style-type: none"> Curtis Island GSDA Environmental Management Precinct LMP Development approval under SP Act or Planning Act and other relevant integrated legislation requiring EYMP and other measures NC Act approval requiring EYMP and other measures 	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U
		Increase in operational lighting impacting on terrestrial fauna associated with Mount Larcom	X	<ul style="list-style-type: none"> GRC Planning Scheme approval under SP Act or Planning Act and other relevant integrated legislation requiring operational lighting controls, pest, weed and noise management 	Low S = H M = L C = M L = P	Low S = H M = L C = M L = P	Low S = H M = L C = M L = U
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or fauna habitat associated with Mount Larcom		<ul style="list-style-type: none"> GRC Planning Scheme approval under SP Act or Planning Act and other relevant integrated legislation requiring operational lighting controls, pest, weed and noise management 	Low S = H M = L C = M L = P	Low S = H M = L C = M L = P	Low S = H M = L C = M L = U

Activities within the: Environmental protection precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.5 for detail)	Risk assessment			Proposed Management Measures (PMMs) required?	Post-PMM implementation risk assessment		
					Sensitivity (S) x Magnitude (M) = Consequence (C)				Sensitivity (S) x Magnitude (M) = Consequence (C)		
					Consequence (C) x Likelihood (L) = Risk				Consequence (C) x Likelihood (L) = Risk		
			Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3			
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent precincts and surrounding areas as a result of operation and maintenance of recreational infrastructure	Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats on Curtis Island, Facing Island and/or other inshore islands	✓	<ul style="list-style-type: none"> ■ GPC LUP for SPL on Facing Island ■ Curtis Island LMP ■ GRC PS for island areas outside SPL and GSDA ■ Development approval under SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures ■ NC Act approval requiring EVMP and other measures 	Low	Low	Low	No	NA	NA	
					S = VH	S = VH	S = VH	No	NA	NA	
					M = N	M = N	M = N	No	NA	NA	
					C = L	C = L	C = L	No	NA	NA	
				L = U	L = U	L = U	No	NA	NA		
		Increase in dust impacts on adjacent terrestrial vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats associated with Mount Larcom	X	<ul style="list-style-type: none"> ■ EVMP and other measures as part of development approval 	Low	Low	Low	No	NA	NA	
					S = H	S = H	S = H	No	NA	NA	
					M = N	M = N	M = N	No	NA	NA	
					C = L	C = L	C = L	No	NA	NA	
				L = U	L = U	L = U	No	NA	NA		
		Sedimentation and decreased water quality in terrestrial areas resulting in decreased condition and/or quality associated with Mount Larcom and the surrounding area	X	As above	Low	Low	Low	No	NA	NA	
					S = H	S = H	S = H	No	NA	NA	
					M = L	M = L	M = L	No	NA	NA	
					C = M	C = M	C = M	No	NA	NA	
				L = U	L = U	L = U	No	NA	NA		
		Increased dust impacts in surrounding areas resulting in reduced air quality	X	<ul style="list-style-type: none"> ■ GPC LUP for SPL on Facing Island ■ Curtis Island LMP ■ GRC PS for island areas outside SPL and GSDA ■ Development approval under SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures ■ NC Act approval requiring EVMP and other measures 	Low	Low	Low	No	NA	NA	
					S = M	S = M	S = M	No	NA	NA	
					M = L	M = L	M = L	No	NA	NA	
					C = L	C = L	C = L	No	NA	NA	
				L = U	L = U	L = U	No	NA	NA		

Activities within the: Environmental protection precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.5 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk
					Scenario 1	Scenario 2	Scenario 3
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Increased movements of vehicles and other modes of transport through protected areas (eg walking, horse riding, ATVs)	Direct mortality and/or injury to terrestrial and intertidal fauna as a result of vehicle strike on Curtis Island, Facing Island and/or other inshore islands Disruption to terrestrial and intertidal fauna behaviour and/or life-cycle due to increased potential for human interaction on Curtis Island, Facing Island and/or other inshore islands Increased levels of waste materials resulting in reduced terrestrial and intertidal fauna habitat condition and/or quality on Curtis Island, Facing Island and/or other inshore islands Introduction of weed and pest species reducing terrestrial and intertidal vegetation communities and/or fauna habitat values on Curtis Island, Facing Island and/or other inshore islands	✓	<ul style="list-style-type: none"> GPC LUP for SPL on Facing Island and GSDA GRC PS for island areas outside SPL and GSDA Curtis Island GSDA Environmental Management Precinct LMP Development approval under SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures NC Act approval requiring EVMP and other measures 	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U
					Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Low S = H M = L C = M L = U
Residential and tourism development on Quoin Island (southern section) and existing townships on Facing Island	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction of residential/tourism developments	Direct mortality and/or injury to terrestrial fauna as a result of vehicle strike at Mount Larcom Disruption to terrestrial fauna behaviour and/or life-cycle due to increased potential for human interaction at Mount Larcom Increased levels of waste materials resulting in reduced terrestrial fauna habitat condition and/or quality at Mount Larcom Introduction of weed and pest species reducing terrestrial vegetation communities and fauna habitat values at Mount Larcom Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat and intertidal vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas Direct mortality and/or injury to terrestrial and/or intertidal fauna as a result of vehicle strike Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	X	<ul style="list-style-type: none"> Development approval under SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures NC Act approval requiring EVMP and other measures 	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = H M = L C = M L = P
					Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Low S = H M = L C = M L = U

Activities within the: Environmental protection precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.5 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
				Scenario 1		Scenario 2		Scenario 3	
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction of residential/tourism developments	Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and intertidal environments	✓	As above	Low S = H M = L C = M L = R	No	NA	NA	NA
		Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	Low S = M M = L C = L L = U	No	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction of residential/tourism developments	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> ACH Act and CHMP and/or Indigenous land use agreement GRC PS for island areas outside SPL and GSDA, SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures 	Medium S = H M = L C = M L = P	Yes - PMM 2	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R
		Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality Increase in dust impacts on surrounding terrestrial and intertidal vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat	✓	<ul style="list-style-type: none"> GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures NC Act approval requiring EVMP and other measures 	High S = VH M = L C = H L = P	Yes - PMM 3, PMM 6 and PMM 8	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U
Increased dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	Alteration of groundwater quality as a result of construction activities (eg spills)	X	As above	Low S = M M = L C = L L = U	No	Low S = M M = L C = L L = U	NA	NA	NA
	Increased edge effects on important nesting habitat for marine turtles on Facing Island Increased edge effects on important foraging/roosting habitat for shorebirds	✓	<ul style="list-style-type: none"> GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures NC Act approval requiring EVMP and other measures 	Negligible S = VH M = N C = L L = R	Yes - PMM 3, PMM 6 and PMM 8	Negligible S = VH M = N C = L L = R	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U

Activities within the: Environmental protection precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.5 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			
				Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3	
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Construction and operation of essential infrastructure to support potential development on Quoin and Facing Islands (eg electricity, water, sewerage, telecommunications network)	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat Direct mortality and/or injury to terrestrial and/or intertidal fauna as a result of vehicle strike Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna Increased edge effects on important nesting habitat for marine turtles on Facing Island Increased edge effects on important foraging/roosting habitat for shorebirds Increase in dust impacts on surrounding terrestrial and intertidal vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats	✓	<ul style="list-style-type: none"> Infrastructure legislation (eg TI Act), SP Act or Planning Act and other relevant integrated legislation requiring EVM/VP and other measures GRC PS for island areas outside SPL and GSDA NC Act approval requiring EVM/VP and other measures 	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U
					Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	NA	NA	NA
					Negligible S = H M = N C = L L = R	Negligible S = H M = N C = L L = R	Negligible S = H M = N C = L L = R	NA	NA	NA
					Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R
		Increased dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists Alteration of groundwater levels and quality as a result of vegetation clearing and construction activities resulting in impacts to surrounding terrestrial, marine and intertidal environments	✓	<ul style="list-style-type: none"> Infrastructure legislation (eg TI Act), SP Act or Planning Act and other relevant integrated legislation requiring EVM/VP and other measures 	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Negligible S = H M = N C = L L = R	NA	NA	NA
		Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> Infrastructure legislation (eg TI Act), SP Act or Planning Act and other relevant integrated legislation requiring EVM/VP and other measures ACH Act and CHMP and/or Indigenous land use agreement 	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R

Activities within the: Environmental protection precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.5 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk
					Scenario 1	Scenario 2	Scenario 3
Expansion/construction, operation and maintenance of new infrastructure to support recreational activities	Increase in operational noise, dust, light, vibration, water quality impacts and other edge effects in adjacent precincts and surrounding areas as a result of an increased development footprint and subsequent increase in the resident and/or visitor populations within the precinct	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna Increase in operational lighting impacting on terrestrial and intertidal fauna Increased edge effects on important foraging/roosting habitat for shorebirds Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	✓	<ul style="list-style-type: none"> GPC LUP for SPL on Facing Island GRC Planning Scheme approval under the SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures 	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P
					Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
					NA	NA	NA
		Increase in dust impacts on surrounding terrestrial and intertidal vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats	✓	<ul style="list-style-type: none"> EVMP and other measures as part of development approval 	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
		Increase dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	<ul style="list-style-type: none"> EVMP and other measures as part of development approval 	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U

Activities within the: Marine industry and recreation precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = M M = M C = M L = U	Low S = M M = L C = L L = P	Low S = M M = L C = L L = U		NA	NA	NA
Increased construction and operational activities associated with the expansion of existing, and/or new industries, recreational and/or educational facilities	Site preparation activities (eg vegetation clearing, grading, transport of materials) associated with expansion of existing, and/or new industries, recreational and/or educational facilities	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat	X	<ul style="list-style-type: none"> GPC LUP (for SPL area) or GPC Planning Scheme (for non SPL areas) Development approval under SP Act or Planning Act and other relevant integrated legislation requiring EYMP and other measures 	Low S = M M = M C = M L = U	Low S = M M = L C = L L = P	Low S = M M = L C = L L = U	No	NA	NA	NA
		Increased edge effects on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments	✓	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = P	Low S = M M = L C = L L = U	No	NA	NA	NA
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and intertidal environments Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents, tourists, commercial activities and parkland users	✓	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
Increased construction and operational activities associated with the expansion of existing, and/or new industries, recreational and/or educational facilities	Site preparation activities (eg vegetation clearing, grading, transport of materials) associated with expansion of existing, and/or new industries, recreational and/or educational facilities	Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas	X	As above	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
		Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> As above GPC Cultural Heritage Protocol (for SPL area) ACH Act and CHMP and/or Indigenous land use agreement 	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA

Activities within the:	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
				Scenario 1		Scenario 2		Scenario 3	
Increased construction and operational activities associated with the expansion of existing, and/or new industries, recreational and/or educational facilities	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion of existing, and/or new industries, recreational and/or educational facilities	Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	X	<ul style="list-style-type: none"> GPC LUP development approval under SP Act or Planning Act and other relevant integrated legislation applicable requiring EVM/P and other measures GPC EMS 	Low S = M M = M C = M L = U	No	NA	NA	NA
			✓	As above	Low S = M M = M C = M L = U	No	NA	NA	NA
			X	As above	Low S = M M = L C = L L = U	No	NA	NA	NA
			✓	<ul style="list-style-type: none"> GPC LUP development approval under SP Act or Planning Act and other relevant integrated legislation applicable requiring EVM/P and other measures GPC EMS 	Negligible S = M M = N C = N L = U	No	NA	NA	NA
Increased edge effects on important foraging/roosting habitat for shorebirds	Increased edge effects on important foraging/roosting habitat for shorebirds	Increased edge effects on important foraging/roosting habitat for shorebirds	✓	As above	Low S = H M = L C = M L = U	No	NA	NA	NA

Activities within the:	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	
					Scenario 1 Scenario 2 Scenario 3	Scenario 1 Scenario 2 Scenario 3	Scenario 1 Scenario 2 Scenario 3	
Increased construction and operational activities associated with the expansion of existing, and/or new industries, recreational and/or educational facilities	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent areas as a result of operation of new or expanded industries, recreational and/or educational facilities	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat , reducing the condition and quality of adjacent habitats Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality Increase in operational lighting impacting on terrestrial and intertidal fauna	✓	<ul style="list-style-type: none"> GPC LUP development approval under SP Act or Planning Act and other relevant integrated legislation applicable requiring EVMP and other measures GPC EMS 	Low S = M M = M C = M L = U	No	Low S = M M = M C = M L = U	NA
		Alteration of groundwater quality as a result of operational activities (eg spills)	✓	As above	Negligible S = M M = N C = N L = U	No	Negligible S = M M = N C = N L = U	NA
		Increased edge effects on important foraging/roosting habitat for shorebirds	✓	As above	Low S = H M = L C = M L = U	No	Low S = H M = L C = M L = U	NA
		Increased dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents, tourists, commercial activities and parkland users	X	<ul style="list-style-type: none"> As above Dust Management Plan Air quality monitoring 	Low S = M M = L C = L L = U	No	Low S = M M = L C = L L = U	NA

Activities within the: Interface precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			
				Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3	
Increased residential density	Increase in the number of residents living adjacent to existing industrial areas and potential for increase in associated construction and operational impacts (eg dust, noise, vibration, visual amenity) from the adjoining port, industry and supply chain precinct	Increase in the number of tourists experiencing social amenity impacts as a result of construction and/or operation of industrial and port industries within the port, industry and supply chain precinct (ie for residents, recreational users or tourists residing in the interface precinct either temporarily or permanently) Increase in lighting, noise and/or vibration impacts and disruption to residents in the interface precinct and surrounding areas Increased dust impacts in adjacent areas resulting in reduced air quality and/or increased odour impacts in the interface precinct and surrounding areas	X	<ul style="list-style-type: none"> GRC Planning Scheme approval requiring appropriate management measures GPC LUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) GPC and port tenants air quality and noise monitoring GPC and port tenants dust management plan GPC operational management measures (refer Table 4.3) EHP licenced activities 	High S = M M = M C = M L = AC	High S = M M = M C = M L = AC	High S = M M = M C = M L = AC	No	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = L M = M C = L L = U	Low S = L M = M C = L L = P	Low S = L M = M C = L L = P		Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U
Construction and operation of a purpose- built cruise ship terminal	Site preparation activities (eg vegetation clearing, grading, transport of materials) associated with construction of the terminal and associated land-based facilities	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat	X	<ul style="list-style-type: none"> ■ GPC LUP development approval under SP Act or Planning Act and other relevant integrated legislation applicable requiring EVMP and other measures ■ GPC EMS ■ GRC Planning Scheme approval under the SP Act or Planning Act (for land not within SPL) and other relevant integrated legislation requiring EVMP and other measures 	Low S = L M = M C = L L = U	Low S = L M = M C = L L = P	Low S = L M = M C = L L = P	No	NA	NA	NA
		Increased edge effects on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments	✓	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Direct mortality and/or injury to terrestrial and/or intertidal fauna as a result of vehicle strike	✓	As above	Low S = L M = M C = L L = U	Low S = L M = M C = L L = U	Low S = L M = M C = L L = U	No	NA	NA	NA
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat	✓	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and intertidal environments	✓	As above	Low S = L M = M C = L L = U	Low S = L M = M C = L L = U	Low S = L M = M C = L L = U	No	NA	NA	NA
		Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas	✓	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	Negligible S = L M = L C = L L = R	Low S = L M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> ■ As above ■ ACH Act and CHMP and/or Indigenous land use agreement 	Low S = L M = L C = L L = U	Low S = L M = L C = L L = U	Low S = L M = L C = L L = U	No	NA	NA	NA

Activities within the:	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	
					Scenario 1	Scenario 2	Scenario 3	
Construction and operation of a purpose-built cruise ship terminal precinct	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction of the terminal and associated land-based facilities	<p>Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna</p> <p>Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat, reducing the condition and quality of adjacent habitats</p> <p>Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat</p> <p>Sedimentation and decreased water quality in surrounding terrestrial and marine areas resulting in decreased condition and/or quality</p> <p>Alteration of groundwater quality as a result of construction activities (eg spills)</p>	✓	<ul style="list-style-type: none"> GPC LUP development approval under SP Act or Planning Act and other relevant integrated legislation applicable requiring EVMP and other measures GPC EMS GRC Planning Scheme approval under the SP Act or Planning Act (for land not within SPL) and other relevant integrated legislation requiring EVMP and other measures 	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = P</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = P</p>	
			✓	As above	<p>Negligible</p> <p>S = M</p> <p>M = N</p> <p>C = N</p> <p>L = U</p>	<p>Negligible</p> <p>S = M</p> <p>M = N</p> <p>C = N</p> <p>L = U</p>	<p>Negligible</p> <p>S = M</p> <p>M = N</p> <p>C = N</p> <p>L = U</p>	NA
			✓	As above	<p>Low</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = U</p>	NA
			X	As above	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	NA
Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent precincts and surrounding areas as a result of operation of the terminal and associated facilities		<p>Increase in dust impacts in surrounding areas resulting in reduced air quality</p> <p>Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents, tourists, commercial activities and parkland users</p> <p>Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat, reducing the condition and quality of adjacent habitats</p>	✓	As above	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	
			✓	As above	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	NA
		Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	✓	As above	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	
			✓	As above	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = M</p> <p>C = M</p> <p>L = U</p>	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U		Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U
Construction and operation of a purpose-built cruise ship terminal	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent precincts and surrounding areas as a result of operation of the terminal and associated facilities	Sedimentation and decreased water quality in surrounding terrestrial and marine areas resulting in decreased condition and/or quality	✓	As above	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
		Alteration of groundwater quality as a result of operational activities (eg spills)	✓	As above	Negligible S = M M = N C = N L = U	Negligible S = M M = N C = N L = U	Negligible S = M M = N C = N L = U	No	NA	NA	NA
		Increase in operational lighting impacting on terrestrial and intertidal fauna	✓	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion of existing, and/or new industries, recreational and/or educational facilities	Increased dust impacts in surrounding areas resulting in reduced air quality	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Increase in light, dust and vibration impacts resulting in a decreased level of social amenity for residents, tourists, commercial activities and parkland users	✓	As above	Low S = M M = L C = M L = U	Low S = M M = L C = M L = U	Low S = M M = L C = M L = U	No	NA	NA	NA
		Increased edge effects on important foraging/roosting habitat for shorebirds	✓	As above	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
Construction and operation of a purpose-built cruise ship terminal	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion of existing, and/or new industries, recreational and/or educational facilities	Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	X	As above	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
		Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat, reducing the condition and quality of adjacent habitats	✓	As above <ul style="list-style-type: none"> ■ As above ■ Dust Management Plan ■ Air quality monitoring 	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
Construction and operation of a purpose-built cruise ship terminal	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion of existing, and/or new industries, recreational and/or educational facilities	Increase in dust impacts in surrounding areas resulting in reduced air quality	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents, tourists, commercial activities and parkland users	✓	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U		Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U
Construction and operation of a purpose-built cruise ship terminal	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion of existing, and/or new industries, recreational and/or educational facilities	✓ Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	✓	<ul style="list-style-type: none"> GPC LUP development approval under SP Act or Planning Act and other relevant integrated legislation applicable requiring EVMF and other measures GPC EMS 	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
		Alteration of groundwater quality as a result of construction activities (eg spills)	✓	As above	Negligible S = M M = N C = N L = U	Negligible S = M M = N C = N L = U	Negligible S = M M = N C = N L = U	No	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent areas as a result of operation of new or expanded industries, recreational and/or educational facilities	✓ Increased edge effects on important foraging/roosting habitat for shorebirds	✓	As above	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	No	NA	NA	NA
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat	✓	As above	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
	Increase in noise and disruption to behaviour/life cycle of terrestrial and intertidal fauna	Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or fauna habitat, reducing the condition and quality of adjacent habitats	✓	As above	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
			✓	As above	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	No	NA	NA	NA
		Alteration of groundwater quality as a result of operational activities (eg spills)	✓	As above	Negligible S = M M = N C = N L = U	Negligible S = M M = N C = N L = U	Negligible S = M M = N C = N L = U	No	NA	NA	NA
			✓	As above	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	
					Scenario 1	Scenario 2	Scenario 3	
Construction and operation of a purpose-built cruise ship terminal	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent areas as a result of operation of new or expanded industries, recreational and/or educational facilities	Increased edge effects on important foraging/roosting habitat for shorebirds	✓	As above	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	
		Increased dust impacts in surrounding areas resulting in reduced air quality	X	<ul style="list-style-type: none"> As above Dust Management Plan Air quality monitoring 	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	NA	
		Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents, tourists, commercial activities and parkland users			Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	NA	
Construction, expansion or upgrades of existing terminal facilities to accommodate increased throughput for each industrial and port industry (eg coal, bulk commodities) (excluding LNG facilities)	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with the construction/expansion/upgrade of terminal facilities	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat	✓	<ul style="list-style-type: none"> EIS approval conditions EPBC Act assessments and controlled action approval (if required) Development approvals under GSDA DS, GPC LUP, SP Act or Planning Act and/or relevant integrated legislation requiring EYMPs and other measures (refer Tables 4.1, 4.2, 4.4 and 4.5) GPC other operational environmental management measures on SPL (refer Table 4.3) 	NA	Low S = L M = M C = L L = U	NA	
		Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of important foraging/roosting habitat for shorebirds in adjacent areas	✓	As above	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA
		Increased edge effects on adjacent terrestrial and intertidal vegetation communities and/or terrestrial, intertidal and marine fauna habitat , reducing the condition and/or quality of adjacent environments	✓	As above	NA	Low S = L M = L C = L L = U	Low S = M M = L C = L L = P	NA
		Direct mortality and/or injury to terrestrial and/or intertidal fauna as a result of vehicle strike	✓	As above	NA	Low S = H M = L C = M L = U	NA	
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat	✓	As above	NA	Low S = L M = L C = L L = U	Low S = L M = L C = L L = P	NA
		Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and intertidal environments	✓	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = M M = L C = L L = U	Medium S = M M = L C = M L = P	High S = M M = L C = L L = U		Low S = M M = L C = L L = U	Medium S = M M = L C = M L = P	High S = M M = L C = L L = U
Construction, expansion or upgrades of existing terminal facilities to accommodate increased throughput for each industrial and port industry (eg coal, bulk commodities) (excluding LNG facilities)	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with the construction/expansion/upgrade of terminal facilities	Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas	X	As above	NA	Low S = M M = L C = L L = U	No	NA	NA	NA	
		Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists in the Interface Precinct and surrounding residential areas within close proximity to the port, industry and supply chain precinct	X	As above	NA	Medium S = M M = L C = M L = P	No	NA	NA	NA	
		Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> As above GPC Cultural Heritage Protocol (for SPL area) ACH Act and CHMP and/or Indigenous land use agreement 	NA	Negligible S = M M = L C = L L = R	No	NA	NA	NA	
		Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion/upgrade of terminal facilities and associated infrastructure	Increase in noise and disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna in adjacent areas	✓	<ul style="list-style-type: none"> EIS approval conditions EPBC Act assessments and controlled action approval (if required) Development approvals under GSDA DS, GPC LUP, SP Act or Planning Act and/or relevant integrated legislation requiring EVMs and other measures (refer Tables 4.1, 4.2, 4.4 and 4.5) GPC other operational environmental management measures on SPL (refer Table 4.3) 	NA	Low S = M M = L C = L L = U	No	NA	NA	NA
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat	X	As above	NA	Low S = L M = L C = L L = U	No	NA	NA	NA
	Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or terrestrial, intertidal and marine fauna habitat, reducing the condition and quality of adjacent habitats	Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities and/or terrestrial, intertidal and marine fauna habitat, reducing the condition and quality of adjacent habitats	✓	As above	NA	Low S = M M = L C = L L = U	No	NA	NA	NA	
	Increased dust impacts in surrounding areas resulting in reduced air quality	Increased dust impacts in surrounding areas resulting in reduced air quality	X	As above	NA	Low S = M M = L C = L L = U	No	NA	NA	NA	

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Medium S = M M = L C = M L = P	Medium S = M M = L C = M L = P	Medium S = M M = L C = M L = P		NA	NA	NA
Construction, expansion or upgrades of existing terminal facilities to accommodate increased throughput for each industrial and port industry (eg coal, bulk commodities) (excluding LNG facilities)	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction/expansion/upgrade of terminal facilities and associated infrastructure	Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists in the Interface Precinct and surrounding residential areas within close proximity to the port, industry and supply chain precinct	X	As above	NA	Medium S = M M = L C = M L = P	Medium S = M M = L C = M L = P	No	NA	NA	NA
		Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	✓	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = P	No	NA	NA	NA
		Alteration of groundwater quality as a result of construction activities (eg spills)	✓	As above	NA	Negligible S = M M = L C = L L = R	Negligible S = M M = L C = L L = R	No	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and surrounding areas as a result of operational activities	Increase in edge effects on important foraging/roosting habitat for shorebirds in adjacent areas	✓	As above	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	No	NA	NA	NA
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities, terrestrial, intertidal and/or marine fauna habitat	✓	As above	Low S = L M = L C = L L = U	Low S = L M = L C = L L = U	No	NA	NA	NA	
		Increase in noise and disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna	✓	As above	Low S = L M = L C = L L = U	Low S = L M = L C = L L = U	No	NA	NA	NA	
	Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat , reducing the condition and quality of adjacent habitats	Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat , reducing the condition and quality of adjacent habitats	✓	As above	Low S = L M = L C = L L = U	Low S = L M = L C = L L = U	No	NA	NA	NA	
		Increase in dust impacts in surrounding areas resulting in reduced air quality	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA	
		Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists in the Interface Precinct and surrounding residential areas within close proximity to the port, industry and supply chain precinct	X	As above	NA	Medium S = M M = L C = M L = P	Medium S = M M = L C = M L = P	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Medium S = M M = M C = M L = P		Low S = M M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
Construction, expansion or upgrades of existing terminal facilities to accommodate increased throughput for each industrial and port industry (eg coal, bulk commodities) (excluding LNG facilities)	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and surrounding operational activities	✓ Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	✓	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Medium S = M M = M C = M L = P	No	NA	NA	NA
		✓ Alteration of groundwater quality as a result of construction activities (eg spills)	✓	As above	Negligible S = M M = L C = L L = R	Negligible S = M M = L C = L L = R	Negligible S = M M = L C = L L = R	No	NA	NA	NA
		✓ Increase in operational lighting impacting on terrestrial, intertidal and marine fauna	✓	As above	Low S = L M = L C = L L = P	Low S = L M = L C = L L = P	Medium S = M M = M C = M L = P	No	NA	NA	NA
		✓ Increased edge effects on important foraging/roosting habitat for shorebirds and marine fauna habitat	✓	As above	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	No	NA	NA	NA
Expansion of the existing APLNG, GLNG and OCLNG plants on Curtis Island requiring additional LNG trains (in accordance with existing approvals)	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	✓ Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and/or intertidal flora species, vegetation communities and fauna habitat	✓	Existing EIS, material change of use and other approval conditions Additional SP Act or Planning Act and other relevant integrated legislation applicable requiring approval, conditions, EVMP and other measures	NA	NA	Low S = M M = M C = M L = U	No	NA	NA	NA
		✓ Direct mortality and/or injury to terrestrial fauna (eg vehicle or machinery strike, clearing activities)	✓	As above	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
		✓ Increased edge effects on adjacent terrestrial and/or intertidal vegetation communities and fauna habitat	✓	As above	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
		✓ Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities and fauna habitat	✓	As above	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
		Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and/or intertidal environments	✓	As above	NA	NA	Negligible S = H M = N C = L L = R	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S=M M=M C=M L=U	Low S=M M=L C=L L=U	Medium S=VH M=L C=H L=U		Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	Negligible S=H M=N C=L L=R
Expansion of the existing APLNG, GLNG and OCLNG plants on Curtis Island requiring additional LNG trains (in accordance with existing approvals)	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas	✓	As above	NA	Low S=M M=M C=M L=U	No	NA	NA	NA	
	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> As above ACH Act and CHMP and/or Indigenous land use agreement 	NA	Low S=M M=L C=L L=U	No	NA	NA	NA	
Increase in noise, dust, light, vibration, water quality impacts and other edge effects during the construction/expansion of existing LNG plants and associated infrastructure	Increase in noise and disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna	Increase in noise and disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna	✓	<ul style="list-style-type: none"> Existing EIS, material change of use and other approval conditions Additional SP Act or Planning Act and other relevant integrated legislation applicable requiring approval, conditions, EVMP and other measures 	NA	Medium S=VH M=L C=H L=U	No	NA	NA	NA	
	Introduction or spread of weed and pest species reducing the quality and/or condition of terrestrial and/or intertidal vegetation communities and fauna habitat	Introduction or spread of weed and pest species reducing the quality and/or condition of terrestrial and/or intertidal vegetation communities and fauna habitat	✓	As above	NA	Low S=H M=L C=M L=U	No	NA	NA	NA	
Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and surrounding areas as a result of operational activities	Increase in dust impacts on adjacent terrestrial and/or intertidal vegetation communities and fauna habitat , reducing the condition and quality of adjacent habitats	Increase in dust impacts on adjacent terrestrial and/or intertidal vegetation communities and fauna habitat , reducing the condition and quality of adjacent habitats	✓	As above	NA	Low S=H M=L C=M L=U	No	NA	NA	NA	
	Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	✓	As above	NA	Low S=H M=L C=M L=U	No	NA	NA	NA	
Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and surrounding areas as a result of operational activities	Alteration of groundwater quality as a result of construction activities (eg spills)	Alteration of groundwater quality as a result of construction activities (eg spills)	✓	As above	NA	Negligible S=H M=N C=L L=R	No	NA	NA	NA	
	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities, and terrestrial, intertidal and/or marine fauna habitat	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities, and terrestrial, intertidal and/or marine fauna habitat	✓	As above	NA	Low S=H M=L C=M L=U	No	NA	NA	NA	
Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	✓	As above	NA	Medium S=H M=M C=H L=U	No	NA	NA	NA	

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U		NA	NA	NA
Expansion of the existing APLNG, GLNG and OCLNG plants on Curtis Island requiring additional LNG trains (in accordance with existing approvals)	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and surrounding areas as a result of operational activities	Increase in dust impacts on adjacent terrestrial and/or intertidal vegetation communities, and habitat , reducing the condition and quality of adjacent habitats	✓	As above		NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	NA	NA	NA
						NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	NA	NA	NA
						NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA
						NA	Negligible S = H M = L C = N L = U	Negligible S = H M = L C = N L = U	NA	NA	NA
						NA	High S = VH M = M C = VH L = U	High S = VH M = M C = VH L = U	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U
Construction of a new LNG plant on Curtis Island	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Alteration of groundwater quality as a result of operational activities (eg spills)	✓	As above		NA	Negligible S = H M = L C = N L = U	Negligible S = H M = L C = N L = U	NA	NA	NA
						NA	High S = VH M = M C = VH L = U	High S = VH M = M C = VH L = U	NA	Yes – PMM 3 and PMM 5	Medium S = VH M = L C = H L = U
						NA	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U	NA	NA	NA
Construction of a new LNG plant on Curtis Island	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Increase in operational lighting impacting on terrestrial and intertidal fauna	✓	As above	<ul style="list-style-type: none"> Existing EIS approval conditions Revised SP Act or Planning Act approval conditions requiring EVMPs and other measures 	NA	High S = VH M = M C = VH L = U	High S = VH M = M C = VH L = U	NA	NA	Medium S = VH M = L C = H L = U
						NA	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U	NA	NA	NA
						NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA
Construction of a new LNG plant on Curtis Island	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and fauna habitat	✓	As above	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures 	NA	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U	NA	NA	NA
						NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA
						NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA
Construction of a new LNG plant on Curtis Island	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Direct mortality and/or injury to terrestrial fauna (eg vehicle or machinery strike, clearing activities)	✓	As above		NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA
						NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA
						NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3	
					Negligible S = H M = N C = L L = R				Low S = M M = M C = M L = U			Medium S = H M = L C = M L = P
Construction of a new LNG plant on Curtis Island	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and intertidal environments	✓	As above	NA	NA	NA	No	NA	NA	NA	
		Decrease in visual amenity recreational users and tourists accessing the surrounding area	✓	As above	NA	NA	NA	No	NA	NA	NA	
		Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	NA	NA	NA	No	NA	NA	NA
		Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> ■ As above ■ ACH Act and CHMP and/or Indigenous land use agreement 	NA	NA	NA	NA	No	NA	NA	NA
		Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	✓	<ul style="list-style-type: none"> ■ EIS approval conditions ■ Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMs and other measures 	NA	NA	NA	NA	No	NA	NA	Low S = H M = L C = M L = U
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities, and intertidal fauna habitat	✓	As above	NA	NA	NA	NA	No	NA	NA	NA
Construction of a new LNG plant on Curtis Island	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Alteration of groundwater quality as a result of construction activities (eg spills)	X	As above	NA	NA	NA	No	NA	NA	NA	
		Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	✓	<ul style="list-style-type: none"> ■ EIS approval conditions ■ Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMs and other measures 	NA	NA	NA	No	NA	NA	Low S = H M = L C = M L = U	

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment		
					Sensitivity (S) x Magnitude (M) = Consequence (C)				Sensitivity (S) x Magnitude (M) = Consequence (C)		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
Construction of a new LNG plant on Curtis Island	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and the environment protection precinct (Curtis Island) as a result of operations	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities, and fauna habitat	✓	As above	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
		Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	✓	<ul style="list-style-type: none"> EIS approval conditions Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures 	NA	NA	Medium S = H M = M C = M L = P	No	NA	NA	Low S = H M = M C = M L = U
		Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality									
Port and associated industrial development on Tide Island Port and new industrial development on Curtis Island (eg Hamilton Point)	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Increase in operational lighting impacting on terrestrial and intertidal fauna	✓	As above	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
		Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and fauna habitat , reducing the condition and quality of adjacent habitats	✓	As above	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
		Increase in dust impacts in surrounding areas resulting in reduced air quality	X	As above	NA	NA	Low S = M M = L C = L L = U	No	NA	NA	NA
Port and associated industrial development on Tide Island Port and new industrial development on Curtis Island (eg Hamilton Point)	Alteration of groundwater quality as a result of operational activities (eg spills)	Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	✓	As above	NA	NA	Low S = H M = N C = L L = U	No	NA	NA	NA
		Alteration of groundwater quality as a result of operational activities (eg spills)	✓	As above	NA	NA	Low S = H M = N C = L L = U	No	NA	NA	NA
		Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and fauna habitat	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures 	NA	NA	Medium S = H M = M C = H L = U	No	NA	NA	NA
Port and associated industrial development on Tide Island Port and new industrial development on Curtis Island (eg Hamilton Point)	Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	Direct mortality and/or injury to terrestrial fauna (eg vehicle or machinery strike, clearing activities)	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures 	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
		Increased edge effects on adjacent terrestrial vegetation communities and terrestrial and/or intertidal fauna habitat , reducing the condition and/or quality of adjacent environments	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures 	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
		Increased edge effects on adjacent terrestrial vegetation communities and terrestrial and/or intertidal fauna habitat , reducing the condition and/or quality of adjacent environments	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures 	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C)			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C)					
					Scenario 1				Scenario 2			Scenario 3		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Port and associated industrial development on Tide Island Port and new industrial development on Curtis Island (eg Hamilton Point)	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction activities	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities, and fauna habitat	✓	As above	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA			
		Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and intertidal environments	✓	As above	NA	NA	Negligible S = H M = N C = L L = R	No	NA	NA	NA			
		Decrease in visual amenity for Gladstone recreational users and tourists accessing the surrounding area	✓	As above	NA	NA	Low S = M M = M C = M L = U	No	NA	NA	NA			
	Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	NA	Low S = M M = L C = L L = U	No	NA	NA	NA				
		Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> As above GPC Cultural Heritage Protocol (for SPL area) ACH Act and CHMP and/or Indigenous land use agreement 	NA	NA	Low S = M M = L C = L L = U	No	NA	NA	NA			
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMs and other measures 	NA	NA	Medium S = H M = L C = M L = P	No	NA	NA	Low S = H M = L C = M L = U			
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities, and terrestrial and intertidal fauna habitat	✓	As above	NA	NA	Low S = H M = L C = M L = U	No	NA	NA	NA			
		Alteration of groundwater quality as a result of construction activities (eg spills)	X	As above	NA	NA	Low S = M M = L C = L L = U	No	NA	NA	NA			

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk
					Scenario 1	Scenario 2	Scenario 3
Port and associated industrial development on Tide Island Port and new industrial development on Curtis Island (eg Hamilton Point)	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	Increase in dust impacts on adjacent terrestrial vegetation communities, and terrestrial and intertidal fauna habitat , reducing the condition and quality of adjacent habitats Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	✓	As above	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and the environment protection precinct (Curtis Island) as a result of operations	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities, and fauna habitat	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures 	NA	NA	NA
		Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality Increase in operational lighting impacting on terrestrial and intertidal fauna	✓	As above	NA	NA	NA
		Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and fauna habitat , reducing the condition and quality of adjacent habitats	✓	As above	NA	NA	NA
		Increase in dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	NA	NA
	Alteration of groundwater quality as a result of operational activities (eg spills)		✓	As above	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			
					Scenario 1	Scenario 2	Scenario 3			
Construction in close proximity to the coast which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat Increased edge effects on adjacent terrestrial and/or intertidal flora species, vegetation communities and terrestrial, intertidal and/or marine fauna habitat , reducing the condition and/or quality of adjacent environments	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EYMPs, offsets and other measures Development approvals under GSDA DS, GPC LUP, SP Act or Planning Act and/or relevant integrated legislation requiring EYMPs and other measures 	Low S = M M = M C = M L = U	High S = H M = M C = H L = P	High S = H M = M C = H L = P	Low S = M M = M C = M L = U	Medium S = H M = M C = H L = U	
		Direct mortality and/or injury to terrestrial and/or intertidal fauna as a result of vehicle strike Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities, and fauna habitat	✓	As above	Low S = M M = L C = L L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U
		Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and/or intertidal environments	✓	As above	Negligible S = M M = N C = N L = U	Low S = H M = N C = L L = U	Low S = H M = N C = L L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U
		Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas	✓	As above	Low S = L M = M C = L L = U	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P
	Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	
	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure	✓	<ul style="list-style-type: none"> As above ACH Act and CHMP and/or Indigenous land use agreement 	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk
					Scenario 1	Scenario 2	Scenario 3
Construction in close proximity to the coast which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	<p>Increase in noise and disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna</p> <p>Introduction or spread of weed and pest species reducing the quality and/or condition of terrestrial and/or intertidal vegetation communities, and fauna habitat</p> <p>Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat reducing the condition and quality of adjacent habitats</p> <p>Increased dust impacts in surrounding areas resulting in reduced air quality</p> <p>Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality</p> <p>Increased edge effects on important foraging/roosting habitat for shorebirds</p> <p>Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists</p>	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under GSDA DS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures 	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Medium</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = P</p>	<p>NA</p> <p>Low</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = U</p>
			<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>NA</p> <p>NA</p> <p>NA</p>	
			<p>Negligible</p> <p>S = M</p> <p>M = N</p> <p>C = N</p> <p>L = U</p>	<p>Low</p> <p>S = H</p> <p>M = N</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = H</p> <p>M = N</p> <p>C = L</p> <p>L = U</p>	<p>NA</p> <p>NA</p> <p>NA</p>	
			<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Medium</p> <p>S = H</p> <p>M = M</p> <p>C = H</p> <p>L = P</p>	<p>Medium</p> <p>S = H</p> <p>M = M</p> <p>C = H</p> <p>L = P</p>	<p>NA</p> <p>Low</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = U</p>	
Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and/or surrounding areas as a result of operational activities	<p>Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal flora vegetation communities and fauna habitat</p> <p>Increase in noise and disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna</p> <p>Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas</p> <p>Increase in operational lighting impacting on terrestrial, intertidal and marine fauna foraging/roosting habitat for shorebirds in adjacent areas</p> <p>Increase in dust impacts on adjacent vegetation communities and terrestrial, intertidal and marine fauna habitat, reducing the condition and quality of adjacent habitats</p>	<p>Alteration of groundwater quality as a result of construction activities (eg spills)</p>	✓	<ul style="list-style-type: none"> EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under GSDA DS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures 	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Medium</p> <p>S = H</p> <p>M = M</p> <p>C = H</p> <p>L = P</p>	<p>NA</p> <p>Low</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = U</p>
		<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>Low</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = U</p>	<p>Low</p> <p>S = M</p> <p>M = L</p> <p>C = L</p> <p>L = U</p>	<p>NA</p> <p>Low</p> <p>S = H</p> <p>M = L</p> <p>C = M</p> <p>L = U</p>		

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U		Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U
Construction in close proximity to the coast which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and/or surrounding areas as a result of operational activities	Increased dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality of environments	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
Construction in non-coastal areas which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Alteration of groundwater quality as a result of construction activities (eg spills) Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and fauna habitat Increased edge effects on adjacent terrestrial vegetation communities and fauna habitat, reducing the condition and/or quality of adjacent environments Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas Direct mortality and/or injury to terrestrial fauna as a result of vehicle strike	✓	As above	Negligible S = M M = N C = N L = U	Negligible S = H M = N C = L L = U	Low S = H M = N C = L L = U	No	NA	NA	NA
Construction in non-coastal areas which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and fauna habitat Increased edge effects on adjacent terrestrial vegetation communities and fauna habitat, reducing the condition and/or quality of adjacent environments Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas Direct mortality and/or injury to terrestrial fauna as a result of vehicle strike	X	Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under GSDA DS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures	Low S = M M = M C = M L = P	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	Yes - PMM 5	NA	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U
Construction in non-coastal areas which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Direct mortality and/or injury to terrestrial fauna as a result of vehicle strike	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = P	Low S = M M = L C = L L = P	No	NA	NA	NA
Construction in non-coastal areas which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and fauna habitat	X	As above	Low S = M M = L C = L L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = P	No	NA	NA	NA
Construction in non-coastal areas which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial environments	X	As above	Negligible S = M M = N C = N L = U	Negligible S = M M = N C = N L = U	Negligible S = M M = N C = N L = U	No	NA	NA	NA
Construction in non-coastal areas which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure	X	As above ACH Act and CHMP and/or Indigenous land use agreement	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U		Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U
Construction in non-coastal areas which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = P	No	NA	NA	NA
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and fauna habitat	X	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act/EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under GSDA DS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures 	Low S = M M = M C = M L = U	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	Yes – PMM 5	NA	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U
		Increase in dust impacts on adjacent terrestrial vegetation communities and fauna habitat reducing the condition and quality of adjacent habitats			Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Increase in dust impacts in surrounding areas resulting in reduced air quality	X	As above	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists			Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
		Sedimentation and decreased water quality in adjacent terrestrial areas resulting in decreased condition and/or quality	X	As above	Negligible S = M M = N C = N L = U	Low S = M M = L C = L L = U	Low S = H M = N C = L L = U	No	NA	NA	NA
		Alteration of groundwater quality as a result of construction activities (eg spills)	X	As above	Low S = M M = M C = M L = U	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	Yes – PMM 5	NA	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent areas of environmental value as a result of operational activities	Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna	X	As above	Low S = M M = M C = M L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
	Increase in dust impacts on adjacent terrestrial vegetation communities and fauna habitat , reducing the condition and quality of adjacent habitats			Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S=L M=M C=L L=U	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U		Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U
Construction in non-coastal areas which includes other new industries (eg steel plant, nickel refinery, fertiliser manufacture, fuel refinery, oil shale) and/or an additional energy supply facility	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent areas of environmental operational activities	Decrease in visual amenity for residents, recreational users and tourists	X	As above	Low	Low	Low	No	NA	NA	NA
					M=L	M=M	M=M				
					C=L	C=M	C=M				
					L=U	L=U	L=U				
					Low	Low	Low	No	NA	NA	NA
Sedimentation and decreased water quality in adjacent terrestrial areas resulting in decreased condition and/or quality	Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	Increased dust impacts in surrounding areas resulting in reduced air quality	X	As above	S=M	S=M	S=M				
					M=L	M=L	M=L				
					C=L	C=L	C=L				
					L=U	L=U	L=U				
					Low	Low	Low	No	NA	NA	NA
Alteration of groundwater quality as a result of construction activities (eg spills)	Increase in operational lighting impacting on terrestrial fauna	Alteration of groundwater quality as a result of construction activities (eg spills)	X	As above	Negligible	Negligible	Negligible	No	NA	NA	NA
					S=M	S=M	S=M				
					M=N	M=N	M=N				
					C=N	C=N	C=N				
					L=U	L=U	L=U				
Increase in operational lighting impacting on terrestrial fauna	Increase in operational lighting impacting on terrestrial fauna	Increase in operational lighting impacting on terrestrial fauna	X	As above	Low	Low	Low	No	NA	NA	NA
					S=M	S=M	S=M				
					M=L	M=L	M=L				
					C=L	C=M	C=M				
					L=U	L=U	L=U				
Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat and intertidal flora species, vegetation and intertidal flora species, marine fauna habitat, reducing the condition and/or quality of adjacent environments	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat and intertidal flora species, marine fauna habitat, reducing the condition and/or quality of adjacent environments	✓	As above	NA	Medium	Medium	Yes – PMM 3 and PMM 5	NA	Low	Low
					S=H	S=H	S=H				
					M=L	M=L	M=L				
					C=M	C=M	C=M				
					L=P	L=P	L=P				
Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Direct mortality and/or injury to terrestrial and/or intertidal fauna as a result of vehicle strike	Direct mortality and/or injury to terrestrial and/or intertidal fauna as a result of vehicle strike	✓	As above	NA	Low	Low	No	NA	NA	NA
					S=H	S=H	S=H				
					M=L	M=L	M=L				
					C=M	C=M	C=M				
					L=U	L=U	L=U				
Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities and fauna habitat	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities and fauna habitat	✓	As above	NA	Low	Low	No	NA	NA	NA
					S=M	S=M	S=M				
					M=M	M=M	M=M				
					C=M	C=M	C=M				
					L=U	L=U	L=U				

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment		
					Sensitivity (S) x Magnitude (M) = Consequence (C)				Sensitivity (S) x Magnitude (M) = Consequence (C)		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
Expansion and operation of the road and rail network in close proximity to the coast within the precinct to accommodate the maximum throughput for each industrial and port industry	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, marine and intertidal environments	✓	As above	NA	Negligible S=M M=N C=N L=R	Negligible S=M M=N C=N L=R	No	NA	NA	NA
		Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	No	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> As above ACH Act and CHMP and/or Indigenous land use agreement 	NA	Low S=H M=L C=M L=R	Low S=H M=L C=M L=U	No	NA	NA	NA
		Increase in noise and disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna	✓	As above	NA	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	No	NA	NA	NA
	Increase in dust impacts on adjacent terrestrial and/or intertidal flora species, vegetation communities, and terrestrial, intertidal and/or marine fauna habitat reducing the condition and quality of adjacent habitats	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities and fauna habitat	✓	As above	NA	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	No	NA	NA	NA
		Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality	✓	<ul style="list-style-type: none"> Infrastructure legislative requirements (eg TI Act) and approval under SP Act or Planning Act and other relevant integrated legislation requiring EVMP and other measures 	NA	Low S=H M=L C=M L=U	Medium S=H M=L C=M L=P	Yes – PMM 3 and PMM 5	NA	NA	Low S=H M=L C=M L=U
		Increased dust impacts in surrounding areas resulting in reduced air quality	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	No	NA	NA	NA
	Alteration of groundwater quality as a result of construction activities (eg spills)	Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	✓	As above	NA	Negligible S=M M=N C=N L=R	Negligible S=M M=N C=N L=R	No	NA	NA	NA
			✓	As above	NA	Negligible S=M M=N C=N L=R	Negligible S=M M=N C=N L=R	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3	
					Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	Low S=M M=M C=M L=U		NA	NA	NA	NA
Expansion and operation of the road and rail network in close proximity to the coast within the precinct to accommodate the maximum throughput for each industrial and port industry	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and/or surrounding areas as a result of operational activities	Direct mortality and/or injury to intertidal and/or terrestrial fauna as a result of vehicle strike	✓	As above	NA	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	Low S=M M=M C=M L=U	No	NA	NA	NA
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and/or intertidal vegetation communities, and fauna habitat	✓	As above	NA	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	No	NA	NA	NA
		Increase in noise and disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna	✓	As above	NA	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	No	NA	NA	NA
		Increase in dust impacts on adjacent terrestrial and intertidal flora species and vegetation communities and/or terrestrial, intertidal and marine fauna habitat , reducing the condition and quality of adjacent habitats	✓	As above	NA	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	No	NA	NA	NA
		Decrease in visual amenity for residents, recreational users and tourists accessing surrounding areas	✓	As above	NA	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	No	NA	NA	NA
		Increased dust impacts in surrounding areas resulting in reduced air quality	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	No	NA	NA	NA
		Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	✓	As above	NA	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	No	NA	NA	NA
		Sedimentation and decreased water quality in adjacent terrestrial and marine areas resulting in decreased condition and/or quality of environments	✓	As above	NA	Negligible S=M M=N C=N L=R	Negligible S=M M=N C=N L=R	Negligible S=M M=N C=N L=R	No	NA	NA	NA
		Alteration of groundwater quality as a result of operational activities (eg spills)	✓	As above	NA	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	No	NA	NA	NA
		Increase in lighting impacting on terrestrial, intertidal and marine fauna	✓	As above	NA	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	Low S=H M=L C=M L=U	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment				
					Sensitivity (S) x Magnitude (M) = Consequence (C)				Sensitivity (S) x Magnitude (M) = Consequence (C)				
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3		
Expansion and operation of the road and rail network in close proximity to the coast within the precinct to accommodate the maximum throughput for each industrial and port industry	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and/or surrounding areas as a result of operational activities	Increased edge effects on important foraging/roosting habitat for shorebirds in adjacent areas	✓	As above	NA	Low S = H M = M C = H L = U	Low S = H M = M C = H L = U	Low S = H M = M C = H L = U	No	NA	NA	NA	
	Site preparation activities (eg vegetation clearing, grading, transport of materials to site) associated with construction	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and/or fauna habitat	X	<ul style="list-style-type: none"> Infrastructure legislative requirements (eg TI Act) and approval under SP Act or Planning Act and other relevant integrated legislation requiring E/MVP and other measures 	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA	
	Expansion and operation of the road and rail network in non-coastal areas within the precinct to accommodate the maximum throughput for each industrial and port industry	Increased edge effects on adjacent terrestrial vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments	Increased edge effects on adjacent terrestrial vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments	X	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
							Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
							Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
	Expansion and operation of the road and rail network in non-coastal areas within the precinct to accommodate the maximum throughput for each industrial and port industry	Direct mortality and/or injury to terrestrial fauna as a result of vehicle strike	Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
							Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
							Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
	Expansion and operation of the road and rail network in non-coastal areas within the precinct to accommodate the maximum throughput for each industrial and port industry	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial flora species, vegetation communities and/or fauna habitat	Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial environments	X	As above	NA	Low S = M M = M C = M L = U	Negligible S = M M = N C = N L = R	Negligible S = M M = N C = N L = R	No	NA	NA	NA
							Low S = M M = M C = M L = U	Negligible S = M M = N C = N L = R	Negligible S = M M = N C = N L = R	No	NA	NA	NA
Low S = M M = M C = M L = U							Negligible S = M M = N C = N L = R	Negligible S = M M = N C = N L = R	No	NA	NA	NA	
Expansion and operation of the road and rail network in non-coastal areas within the precinct to accommodate the maximum throughput for each industrial and port industry	Decrease in visual amenity for residents, recreational users and tourists accessing surrounding areas	Decrease in visual amenity for residents, recreational users and tourists accessing surrounding areas	X	As above	NA	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA	
						Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA	
						Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA	
Expansion and operation of the road and rail network in non-coastal areas within the precinct to accommodate the maximum throughput for each industrial and port industry	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	X	<ul style="list-style-type: none"> As above ACH Act and CHMP and/or Indigenous land use agreement 	NA	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	No	NA	NA	NA	
						Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	No	NA	NA	NA	
						Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	No	NA	NA	NA	

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					NA	Low S=M M=L C=L L=U	Low S=M M=M C=M L=U		NA	NA	NA
Expansion and operation of the road and rail network in non-coastal areas within the precinct to accommodate the maximum throughput for each industrial and port industry	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=M C=M L=U	NA	NA	NA	NA
		Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and terrestrial fauna habitat	X	As above	NA	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	NA	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	Increase in dust impacts on adjacent vegetation communities and terrestrial fauna habitat reducing the condition and quality of adjacent habitats	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	NA	NA	NA	NA
		Increased dust impacts in surrounding areas resulting in reduced air quality	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	NA	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	NA	NA	NA	NA
		Sedimentation and decreased water quality in adjacent terrestrial areas resulting in decreased condition and/or quality	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	NA	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction activities	Alteration of groundwater quality as a result of construction activities (eg spills)	X	As above	NA	Negligible S=M M=N C=N L=R	Negligible S=M M=N C=N L=R	NA	NA	NA	NA
		Direct mortality and/or injury to terrestrial fauna as a result of vehicle strike	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	NA	NA	NA	NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in areas with environmental value as a result of operational activities	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or terrestrial fauna habitat	X	As above	NA	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	NA	NA	NA	NA
		Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna	X	As above	NA	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	NA	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk				
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3		
					Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U		NA	NA	NA	NA	NA
Expansion and operation of the road and rail network in non-coastal areas within the precinct to accommodate the maximum throughput for each industrial and port industry	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in areas with environmental value as a result of operational activities	Increase in dust impacts on adjacent terrestrial vegetation communities and/or terrestrial fauna habitat , reducing the condition and quality of adjacent habitats	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	No	NA	NA	NA	
		Decrease in visual amenity for residents, recreational users and tourists accessing surrounding areas	X	As above	NA	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	Low S=M M=M C=M L=U	No	NA	NA	NA	
	Increased dust impacts in surrounding areas resulting in reduced air quality	Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	Increase in dust impacts in surrounding areas resulting in reduced air quality	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	No	NA	NA	NA
			Sedimentation and decreased water quality in adjacent terrestrial areas resulting in decreased condition and/or quality	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	No	NA	NA	NA
	Alteration of groundwater quality as a result of operational activities (eg spills)	Increase in operational lighting impacting on terrestrial fauna	Alteration of groundwater quality as a result of operational activities (eg spills)	X	As above	NA	Negligible S=M M=N C=N L=R	Negligible S=M M=N C=N L=R	Negligible S=M M=N C=N L=R	No	NA	NA	NA
			Increase in operational lighting impacting on terrestrial fauna	X	As above	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U	Yes – PMM 3 and PMM 5	NA	Low S=M M=L C=L L=U	Low S=M M=L C=L L=U

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk Scenario 1 Scenario 2 Scenario 3	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk Scenario 1 Scenario 2 Scenario 3
Construction and operation of supporting/ancillary infrastructure (eg quarries, residue storage facilities etc.) within non-coastal areas to accommodate the maximum throughput for each industrial and port industry	Site preparation activities (eg vegetation clearing, grading, transport of materials) for the establishment of expanded and new facilities	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and fauna habitat Increased edge effects on adjacent terrestrial flora species, vegetation communities and fauna habitat , reducing the condition and/or quality of adjacent environments Direct mortality and/or injury to terrestrial fauna as a result of vehicle strike Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and fauna habitat Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial environments Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPMO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under GSDA DS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures 	NA Scenario 1 Low S = M M = L C = L L = U Scenario 2 Low S = M M = L C = L L = U Scenario 3 NA	No	NA Scenario 1 NA Scenario 2 NA Scenario 3 NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction of expanded and new facilities	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance Loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and fauna habitat Increase in dust impacts on adjacent terrestrial vegetation communities and fauna habitat reducing the condition and quality of adjacent habitats Sedimentation and decreased water quality in adjacent terrestrial areas resulting in decreased condition and/or quality Alteration of groundwater quality as a result of construction activities (eg spills) Increased dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	<ul style="list-style-type: none"> As above ACH Act and CHMP and/or Indigenous land use agreement EIS assessment and approval process with conditions (if required) requiring EVMPs, offsets and other measures Development approvals under GSDA DS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures 	NA Scenario 1 Low S = H M = L C = M L = R Scenario 2 Low S = H M = L C = M L = R Scenario 3 NA	No	NA Scenario 1 NA Scenario 2 NA Scenario 3 NA
	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during construction of expanded and new facilities	Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and fauna habitat Increase in dust impacts on adjacent terrestrial vegetation communities and fauna habitat reducing the condition and quality of adjacent habitats Sedimentation and decreased water quality in adjacent terrestrial areas resulting in decreased condition and/or quality Alteration of groundwater quality as a result of construction activities (eg spills) Increased dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	<ul style="list-style-type: none"> As above 	NA Scenario 1 Low S = M M = L C = L L = P Scenario 2 Low S = M M = L C = L L = P Scenario 3 NA	No	NA Scenario 1 Low S = M M = L C = L L = U Scenario 2 Low S = M M = L C = L L = U Scenario 3 NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk					
				Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3			
Construction of new or expansion of existing dredged material placement areas to accommodate dredged material placement	Preparation of the reclamation site, including clearing of intertidal vegetation resulting in the direct loss or fragmentation of habitats	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of intertidal flora species, vegetation communities, benthic communities, and/or intertidal fauna habitat	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures GPC LUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) for an extension to existing SPL or near shipping channel GSDA DS approval requiring appropriate management measures GRC PS approval (where not within the GSDA DS or GPC LUP) requiring appropriate management measures 	NA	High S = H M = M C = H L = L	High S = H M = M C = H L = L	High S = H M = M C = H L = L	NA	Medium S = H M = M C = H L = U		
			✓	As above	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	NA	NA	NA	
			✓	As above	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA	
			✓	As above	NA	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	NA	NA	NA	
			✓	As above	NA	Low S = M M = L C = L L = P	Low S = M M = L C = L L = P	Low S = M M = L C = L L = P	NA	NA	NA	
			✓	As above	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	NA	NA	NA	
			Direct mortality and/or injury to terrestrial and/or intertidal fauna as a result of vehicle strike	✓	As above	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	NA	NA	NA
			Increased dust impacts on adjacent terrestrial and intertidal vegetation communities, and intertidal fauna habitat , reducing the condition and/or quality of adjacent environments	✓	As above	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA
			Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities, and terrestrial and intertidal fauna habitat	✓	As above	NA	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	NA	NA	NA
			Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas	✓	As above	NA	Low S = M M = L C = L L = P	Low S = M M = L C = L L = P	Low S = M M = L C = L L = P	NA	NA	NA
Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	✓	As above	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	NA	NA	NA			

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					Low S = M M = L C = L L = U	Low S = H M = L C = M L = U	Low S = H M = N C = L L = U		NA	NA	NA
Construction of new or expansion of existing dredged material placement areas to accommodate dredged material placement	Preparation of the reclamation site, including clearing of intertidal vegetation resulting in the direct loss or fragmentation of habitats	Increased dust impacts in surrounding areas resulting in reduced air quality	X	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	NA	NA	NA	NA
		Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	✓	As above	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA	NA
		Sedimentation and decreased water quality in adjacent terrestrial, intertidal and marine areas resulting in decreased condition and/or quality	✓	As above	NA	Low S = H M = N C = L L = U	Low S = H M = N C = L L = U	NA	NA	NA	NA
		Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial and intertidal environments	✓	As above	NA	Low S = H M = N C = L L = U	Low S = H M = N C = L L = U	NA	NA	NA	NA
		Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	As above	NA	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	NA	NA	NA	NA
Placement of core material, rock armour and earth material over intertidal sediments to design height above that of the surrounding water level	Direct disturbance resulting in the loss, fragmentation or loss of terrestrial and intertidal fauna habitat	Direct disturbance resulting in the loss, fragmentation or loss of terrestrial and intertidal fauna habitat	✓	<ul style="list-style-type: none"> As above GPC Cultural Heritage Protocol ACH Act and CHMP and/or Indigenous land use agreement 	NA	High S = H M = M C = H L = L	High S = H M = M C = H L = L	Yes – PMM 3 and PMM 5	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U
		Direct mortality and/or injury to intertidal fauna during placement of rock and/or machinery movements	✓	As above	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	No	NA	NA	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
				Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Construction of new or expansion of existing dredged material placement areas to accommodate dredged material placement	Placement of core material, rock armour and earth material over intertidal sediments to design height above that of the surrounding water level.	Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas	✓	As above	NA	Medium S = M M = M C = M L = P	NA	NA	NA
		Direct impacts on cultural heritage sites during placement of bund wall material	✓	<ul style="list-style-type: none"> As above GPC Cultural Heritage Protocol ACH Act and CHMP and/or Indigenous land use agreement 	NA	Low S = H M = L C = M L = R	NA	NA	NA
		Increase in noise and vibration and potential disruption to behaviour/life-cycle of terrestrial and intertidal fauna Erosion, sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act/EIS assessment and approval process with conditions requiring EYMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EYMPs and other measures GPC LUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) for an extension to existing SPL or near shipping channel GSDA DS approval requiring appropriate management measures GRC PS approval (where not within the GSDA DS or GPC LUP) requiring appropriate management measures 	NA	High S = VH M = L C = H L = P	NA	High S = VH M = L C = H L = P	Yes – PMM 3, PMM 4 and PMM 5
Construction of new or expansion of existing dredged material placement areas to accommodate dredged material placement	Placement of core material, rock armour and earth material over intertidal sediments to design height above that of the surrounding water level.	Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial and intertidal fauna habitat , reducing the condition and quality of adjacent habitats	✓	As above	NA	Low S = H M = L C = M L = U	NA	NA	NA
		Alteration of water quality as a result of construction activities (eg spills) Changes to marine water velocities and potential erosion, sedimentation and decreased water quality impacts in adjacent intertidal and marine areas resulting in decreased condition and/or quality Loss of Traditional Owner access to land as a result of the construction of the bund wall	✓	As above	NA	Low S = H M = L C = M L = U	NA	Low S = H M = L C = M L = U	NA

Activities within the: Port, industry and supply chain precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	
					Scenario 1	Scenario 2	Scenario 3	
Construction of new or expansion of existing dredged material placement areas to accommodate dredged material placement	Placement of core material, rock armour and earth material over intertidal sediments to design height above that of the surrounding water level	Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	Low S = M M = L C = L L = U	NA	NA
Operations of existing, expanded and new port, industry and supporting infrastructure (refer activities above within this precinct)	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and/or surrounding areas during operation of existing, expanded or new facilities and supporting infrastructure	Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna Increase in dust impacts on adjacent terrestrial vegetation communities and fauna habitat , reducing the condition and quality of adjacent habitats Decrease in visual amenity for residents, recreational users and tourists accessing surrounding areas Sedimentation and decreased water quality in adjacent terrestrial areas resulting in decreased condition and/or quality Increase in operational lighting impacting on terrestrial fauna Increased dust impacts in surrounding areas resulting in reduced air quality	✓	<ul style="list-style-type: none"> EIS assessment (where relevant) and development approval process with conditions (if required) requiring EVMPs, offsets and other measures Development approvals under GSDA DS, GPC LUP, GRC PS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures 	NA	Medium S = H M = M C = H L = U	NA	Low S = H M = L C = M L = U
		Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists in the Interface Precinct and surrounding residential areas within close proximity to the port, industry and supply chain precinct	X	As above	NA	Low S = M M = L C = L L = U	NA	NA
		Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists in the Interface Precinct and surrounding residential areas within close proximity to the port, industry and supply chain precinct	X	As above	NA	Medium S = M M = L C = M L = P	NA	NA
	Increase in workforce numbers and transport movements for workforce, materials and other goods required for the operation of facilities under the growth scenario	Increase in pressure on community infrastructure and services (eg airport; health and emergency services; food, water and electricity supply) Increase in noise impacts on residents adjoining transport infrastructure Increase in demand for rental/sale properties which may result in decrease in housing affordability if the demand exceeds the supply of housing Decrease in social/community cohesion due to influx of temporary workforce, potentially leading to increased social and health related issues Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists in the Interface Precinct and surrounding residential areas within close proximity to the port, industry and supply chain precinct	X	<ul style="list-style-type: none"> EIS assessment and approval process with conditions (if required) requiring EVMPs, offsets and other measures Development approvals under GSDA DS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures 	NA	Low S = M M = L C = L L = U	NA	NA

Activities within the: Marine precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					High S = H M = M C = H L = L	High S = H M = M C = H L = L	High S = H M = M C = H L = L		NA	NA	NA
Construction of new or expansion of existing dredged material placement areas to accommodate dredged material placement	Preparation of the reclamation site, including clearing of intertidal vegetation (eg mangroves) resulting in the direct loss or fragmentation of habitats	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of intertidal flora species, vegetation communities, benthic communities, intertidal fauna habitat and/or marine fauna habitat	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMs, offsets and other measures Development approvals under GRC PS and SP Act or Planning Act and relevant integrated legislation requiring EVMs and other measures GPC LUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) for an extension to existing SPL or near shipping channel 	NA	High S = H M = M C = H L = L	Yes – PMM 3 and PMM 5	NA	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U	
		Direct mortality and/or injury to shorebirds and/or intertidal fauna as a result of vehicle strike	✓	As above	NA	Medium S = VH M = L C = H L = U	No	NA	NA	NA	
		Increased dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat , reducing the condition and/or quality of adjacent environments	✓	As above	NA	Low S = H M = L C = M L = U	No	NA	NA	NA	
	Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas	Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat	As above	✓	As above	NA	Medium S = H M = L C = M L = P	No	NA	NA	NA
			Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas	✓	As above	NA	Low S = M M = L C = L L = P	No	NA	NA	NA
			Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna	✓	As above	NA	Medium S = VH M = L C = H L = U	No	NA	NA	NA
	Sedimentation and decreased water quality in adjacent terrestrial, intertidal and marine areas resulting in decreased condition and/or quality	Sedimentation and decreased water quality in adjacent terrestrial, intertidal and marine areas resulting in decreased condition and/or quality	As above	✓	As above	NA	Low S = H M = L C = M L = U	No	NA	NA	NA
			As above	✓	As above	NA	Low S = H M = L C = M L = U	No	NA	NA	NA

Activities within the: Marine precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3	
					Low S = M M = L C = L L = U	Low S = H M = N C = L L = U	Low S = M M = L C = L L = U		NA	NA	NA	NA
Construction of new or expansion of existing dredged material placement areas to accommodate dredged material placement	Preparation of the reclamation site, including clearing of intertidal vegetation (eg mangroves) resulting in the direct loss or fragmentation of habitats	Increased dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists Alteration of groundwater levels and quality as a result of vegetation clearing resulting in impacts to surrounding terrestrial, intertidal and marine environments	X	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA	
					NA	Low S = H M = N C = L L = U	Low S = H M = N C = L L = U	No	NA	NA	NA	
					NA	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	No	NA	NA	NA	
Placement of core material, rock armour and earth material over seabed sediments to crest height above that of the surrounding water level	Direct disturbance resulting in the loss, fragmentation or loss of benthic communities and/or coral reefs	Direct impacts on cultural heritage sites during vegetation clearing and land disturbance	✓	<ul style="list-style-type: none"> ■ As above ■ GPC Cultural Heritage Protocol ■ ACH Act and CHMP and/or Indigenous land use agreement 	NA	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	No	NA	NA	NA	
					NA	High S = H M = M C = H L = L	High S = H M = M C = H L = L	Yes – PMM 3 and PMM 5	NA	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U
					NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	No	NA	NA	NA	NA
Direct mortality and/or injury to intertidal fauna during placement of rock, machinery movements and/or marine fauna (eg fish) enclosed within the bund walls	Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas	Direct mortality and/or injury to intertidal fauna during placement of rock, machinery movements and/or marine fauna (eg fish) enclosed within the bund walls	✓	As above	NA	Medium S = M M = M C = M L = P	Medium S = M M = M C = M L = P	No	NA	NA	NA	
					NA	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	No	NA	NA	NA	
					NA	Low S = H M = L C = M L = R	Low S = H M = L C = M L = R	No	NA	NA	NA	

Activities within the: Marine precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					NA	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P		NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
Construction of new or expansion of existing dredged material placement areas to accommodate dredged material placement	Placement of core material, rock armour and earth material over seabed sediments to crest height above that of the surrounding water level	Increase in noise and vibration and potential disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna Erosion, sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality	✓	<ul style="list-style-type: none"> EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under GRC PS and SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures GPC LUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) for an extension to existing SPL or near shipping channel 	NA	High S = VH M = L C = H L = P	High S = VH M = L C = H L = P	Yes – PMM 3 and PMM 5	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
		Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat , reducing the condition and quality of adjacent habitats	✓	As above	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	No	NA	NA	NA
		Alteration of water quality as a result of construction activities (eg spills) Changes to marine water velocities and potential erosion, sedimentation and decreased water quality impacts in adjacent intertidal and marine areas resulting in decreased condition and/or quality	✓	As above	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	No	NA	NA	NA
		Increase in dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
Construction and operation of new jetties and wharves or expansion of existing wharves to accommodate maximum throughput	Construction including cargo handling infrastructure and pile driving activities associated with jetty/wharf construction	Direct mortality and/or injury to intertidal and/or marine fauna as a result of vessel strike Direct disturbance resulting in the loss or fragmentation of benthic communities and/or coral reefs Direct disturbance resulting in the loss or fragmentation of intertidal flora species and vegetation communities Increase in noise, vibration and disruption to behaviour/life-cycle of intertidal and marine fauna Sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality	✓	<ul style="list-style-type: none"> EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures GPC LUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) for an extension to existing SPL 	NA	Medium S = VH M = L C = H L = U	High S = VH M = L C = H L = P	Yes – PMM 3 and PMM 5	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U

Activities within the: Marine precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment			
					Sensitivity (S) x Magnitude (M) = Consequence (C)				Sensitivity (S) x Magnitude (M) = Consequence (C)			
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3	
Construction and operation of new jetties and wharves or expansion of existing wharves to accommodate maximum throughput	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in adjacent areas during operation	Increased edge effects on adjacent intertidal vegetation communities, and intertidal and marine fauna habitat , reducing the condition and/or quality Increase in lighting impacts on behaviour/life-cycle of intertidal and marine fauna	✓	<ul style="list-style-type: none"> EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures GPC LLUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) for an extension to existing SPL 	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	Yes – PMM 3 and PMM 5	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	
			Introduction or spread of pest and weed species resulting in reduced condition and/or quality of intertidal vegetation communities, and intertidal and marine fauna habitat	✓	As above	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	No	NA	NA	NA
			Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas	✓	As above	NA	Low S = M M = M C = M L = U	Low S = M M = M C = M L = U	No	NA	NA	NA
	Increase in vessel numbers and movements (industrial, commercial and recreational) during operation Increase in use of anchorage locations due to increase in vessel numbers and movements during operation Increase in substrate from additional marine structures	Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat , reducing the condition and quality Increased dust impacts in surrounding areas resulting in reduced air quality Increase in light, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists Increase in direct mortality and/or injury to intertidal and/or marine fauna as a result of vessel strike Increase in noise and disruption to behaviour/life-cycle of intertidal and marine fauna Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas Beneficial impact that increases the opportunities for establishment of benthic communities and associated marine fauna	✓	As above	NA	Low S = M M = M C = M L = U	Low S = M M = L C = L L = U	No	NA	NA	NA	
			Increased dust impacts in surrounding areas resulting in reduced air quality	X	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	NA	NA
			Beneficial impact that increases the opportunities for establishment of benthic communities and associated marine fauna	✓	As above	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	No	NA	NA	NA

Activities within the: Marine precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk		
					Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3
					NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U		NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
Capital dredging for the port channels, and new berth pockets and swing basins	Removal of seabed material during capital dredging and transport of dredged material to existing and/or new reclamation areas	Direct mortality and/or injury to intertidal and/or marine fauna as a result of vessel strike and/or dredging activity Direct disturbance resulting in the loss or fragmentation of benthic communities Direct disturbance resulting in the loss or fragmentation of seagrass meadows Increase in noise, vibration and disruption to behaviour/life-cycle of intertidal and marine fauna	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMs and other measures GPC operational environmental management measures (refer Table 4.3) 	NA	Medium S = VH M = L C = H L = U	Medium S = VH M = L C = H L = U	Yes – PMM 3 and PMM 5	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
	Dewatering via controlled release into Port Curtis via licenced discharge points from the reclamation area	Sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality of adjacent intertidal and marine environments as a result of the dredging plume or release of contaminants (eg spills)	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMs, offsets and other measures Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMs and other measures GPC operational environmental management measures (refer Table 4.3) 	NA	Medium S = H M = M C = H L = U	Medium S = H M = M C = H L = U	Yes – PMM 3 and PMM 5	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
	Increase in noise, dust, light, vibration and water quality impacts during construction of new industrial and/or port areas on reclamation areas	Direct loss or change in benthic communities near the licenced discharge point Increase in noise, vibration and disruption to behaviour/life-cycle of intertidal and marine fauna Sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality	✓	<ul style="list-style-type: none"> Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMs and other measures GPC LUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) for an extension to existing SPL As above 	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	No	NA	Low S = H M = L C = M L = U	NA
Establishment of final landforms, rehabilitation and land uses on reclamation areas	Increase in noise, dust, light, vibration and water quality impacts during construction of new industrial and/or port areas on reclamation areas	Increase in light, dust, noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	<ul style="list-style-type: none"> Development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMs and other measures GPC LUP approval requiring appropriate management measures (refer Tables 4.2 and 4.3) for an extension to existing SPL As above 	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	No	NA	Low S = M M = L C = L L = U	NA

Activities within the:	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Priority Management Measures (PMMs) required?	Post-PMM implementation risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk					
					Scenario 1	Scenario 2	Scenario 3					
Marine precinct	Increase in noise, dust, light, vibration, water quality impacts and other edge effects during operation in the marine precinct and surrounding areas (dependent on the specific location of the reclamation area) as a result of construction and operational activities	Sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality Increased edge effects on adjacent intertidal vegetation communities, and intertidal and marine fauna habitat, reducing the condition and/or quality Increase in lighting impacts on behaviour/life-cycle of intertidal and marine fauna Introduction or spread of pest and weed species resulting in reduced condition and/or quality of intertidal vegetation communities, and intertidal and marine fauna habitat Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial, intertidal and fauna habitat, reducing the condition and quality	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under the GSDA DS, GRC PS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures (refer Tables 4.1, 4.4 and 4.5) 	NA	Medium S = H M = L C = M L = P	Medium S = H M = L C = M L = P	NA	Yes – PMM 3 and PMM 5	NA	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U
	Increase in vehicle (road and rail) movements throughout the precinct and surrounding areas to transport workforce, construction materials and other goods	Increase in noise and air quality impacts for adjoining areas of environmental value and/or residential land uses Increase in noise and vibration impacts resulting in a decreased level of social amenity for residents and tourists	X	As above	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	NA	No	NA	NA	NA
	Site preparation activities (eg vegetation clearing, grading and transport of materials) for construction of road and rail and/or infrastructure corridor within intertidal areas. Includes the placement of fill material and erosion protection controls within the intertidal and marine areas during construction	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of intertidal flora species, vegetation communities and fauna habitat Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas	✓	<ul style="list-style-type: none"> Infrastructure legislative requirements (eg TI Act) and development approvals under SP Act or Planning Act and relevant integrated legislation requiring EVMPs and other measures Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMPs, offsets and other measures Development approvals under the GSDA DS, GRC PS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMPs and other measures (refer Tables 4.1, 4.4 and 4.5) 	NA	Low S = M M = L C = L L = U	Low S = M M = L C = L L = U	NA	No	NA	NA	NA

Activities within the: Marine precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk Scenario 1 Scenario 2 Scenario 3	Proposed Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk Scenario 1 Scenario 2 Scenario 3
Construction and operation of road and rail bridge from the mainland to Curtis Island Infrastructure corridor link from Curtis Island to Tide Island	Increase in noise, dust, light, vibration, water quality impacts and other edge effects in the marine precinct and surrounding areas as a result of increased development footprint and increased movements of vehicles and trains adjacent to intertidal and marine areas during operation	Increase in noise and disruption to behaviour/life-cycle of intertidal and marine fauna due to vehicle/train movements Decrease in visual amenity for recreational boating and tourism operations accessing the surrounding areas Sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality as a result of runoff from the bridge and potential spills Introduction or spread of pest and weed species resulting in reduced condition and/or quality of intertidal vegetation communities, and intertidal and marine fauna habitat Increase in dust impacts on surrounding terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat , reducing the condition and quality	✓	<ul style="list-style-type: none"> Commonwealth controlled action under the EPBC Act and SDPWO Act EIS assessment and approval process with conditions requiring EVMs, offsets and other measures Development approvals under the GSDA DS, GRC PS, SP Act or Planning Act and/or relevant integrated legislation requiring EVMs and other measures (refer Tables 4.1, 4.4 and 4.5) 	NA NA NA	No	NA NA NA
Increased commercial vessels movements resultant from maximum throughput for each industrial and port industry	Increase in vessel movements within the marine precinct and GBRWHA as result of the expanded port and industrial industries	Decrease in marine water quality impacting resulting in decreased condition and/or quality of marine environmental values Increase in direct mortality and/or injury to marine fauna as a result of vessel strike Direct disturbance resulting in the loss or reduced quality of benthic communities and/or coral reefs	✓	<ul style="list-style-type: none"> Designated shipping areas Compulsory pilotage Mandatory vessel monitoring and reporting (ie Great Barrier Reef and Torres Strait Vessel Traffic Service) PP Ships Act and TOMP Act requirements for pollution controls and prevention documentation Marine Safety Act Navigation Act 2012 QCPP, Marine Order 54, Marine Notices and Pilot Advisor Notices Port Procedures and Information for Shipping Port of Gladstone 2012 Standard for Marine Construction Activities with Gladstone Harbour (MSQ 2013) 	NA Medium S = VH M = L C = H L = U	No	NA Medium S = VH M = L C = H L = U

Activities within the: Marine precinct	Cause	Potential impact on environmental value	OUV of the GBR WHA	Management measure (refer Tables 4.1 to 4.4 for detail)	Risk assessment Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk	Proposed Management Measures (PMMs) required?	Post-PMM implementation risk Sensitivity (S) x Magnitude (M) = Consequence (C) Consequence (C) x Likelihood (L) = Risk			
				Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3	
Maintenance dredging and dredged material placement at sea within the GPC existing East Banks dredged material placement area (DMPA)	Removal of seabed material during maintenance dredging	Direct mortality and/or injury to marine fauna as a result of vessel strike and/or dredging activity Direct disturbance resulting in the loss or fragmentation of benthic communities Increase in noise, vibration and disruption to behaviour/life-cycle of marine fauna Sedimentation and decreased water quality in adjacent marine areas resulting in decreased condition and/or quality of adjacent marine environments as a result of the dredging plume or release of contaminants (eg spills)		<ul style="list-style-type: none"> Sea Dumping Act and EP Act applications, and conditions requiring EVMPs and other measures GPC operational environmental management measures (refer Table 4.3) 	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA
	Increase in dredged material placed at the existing East Banks DMPA for maintenance dredging of the channel	Direct mortality and/or injury to marine fauna as a result of vessel strike and/or dredging activity Increase in noise, vibration and disruption to behaviour/life-cycle of marine fauna Sedimentation and decreased water quality in adjacent marine areas resulting in decreased condition and/or quality of adjacent marine environments as a result of the dredged material placement plume or release of contaminants (eg spills)		<ul style="list-style-type: none"> Sea Dumping Act application and conditions requiring EVMPs and other measures GPC operational environmental management measures (refer Table 4.3) 	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	Low S = H M = L C = M L = U	NA	NA	NA

5.7 Priority management measures

Table 5.7 provides the proposed PMMs for the master planned area, including the justification for the PMM being required, the proposed implementation mechanism and the entity responsible for the implementation (and appropriate advisory entities) of each PMM.

As stated in Section 2.5, the process implemented for identifying PMMs for development activities within the master planned area included:

- Assessment of the gaps and potential for the existing statutory requirements and operational management measures to address and minimise the potential impacts
- Assessment of whether inconsistencies, information and management gaps, and implementation timeframe gaps are likely to occur during the implementation of existing statutory requirements and operational management measures over the master planning timeframe
- Assessment of the security of non-statutory measures (ie voluntary) over the master planning timeframe
- Identification of PMM and reasoning/justification for the measure being required
- Identification of the implementation mechanism and responsible entity (and appropriate advisory entities) for the PMM

Furthermore, PMMs are measures that are determined to be important to the future and ongoing management of potential impacts on the OUV of the GBRWHA and other environmental values within, and surrounding, the master planned area.

The proposed PMMs have been prepared for DSD's consideration in drafting the master plan and port overlay. DSD will further consider implementation matters with relevant stakeholders.

5.7.1 Environmental protection precinct

- PMM 1 Amend the Gladstone Regional Council Planning Scheme to change the zoning over Mount Larcom landform area to Environmental Management as part of the next Planning Scheme review process
- PMM 2 Prior to undertaking any operational works within the master planned area, proponents who are not operating in accordance with a cultural heritage management plan approved under the *Aboriginal Cultural Heritage Act 2003*, an Indigenous Land Use Agreement registered under the *Native Title Act 1993*, or an agreement with an Aboriginal Party made in accordance with the *Native Title Act 1993*, will notify the traditional owner representative (of the operational works) as part of implementing the 'cultural heritage duty of care' requirements of the *Aboriginal Cultural Heritage Act 2003*

Note: An approved cultural heritage management plan is a plan that has been approved by the chief executive or the Minister under part 7 of the *Aboriginal Cultural Heritage Act 2003*



PMM 3 Where necessary to supplement existing environmental value monitoring and technical reporting, undertake surveys within and surrounding the master plan marine precinct to monitor the health of the following values and habitats:

- Seagrass meadows and macroalgae
- Coral reefs
- Marine fauna and their habitat
- Shorebirds and their habitat

Surveys are to be undertaken every five years

Note: This information is to be incorporated into the mapping and information maintained in PMM 4

PMM 4 To consolidate, manage and update every five years all the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental value information and mapping for the master planned area

PMM 6 Prepare a Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline which shall include requirements to:

- Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within the environmental protection precinct areas to be managed (with reference to the data and information collected in PMM 4)
- Define the objectives and management outcomes of the environmental protection precinct area (Land Management Plan objectives should be consistent with the environmental protection precinct environmental management framework objectives within the master plan)
- Identify the existing and potential threats and potential risks to achieving the environmental protection precinct objectives and management outcomes
- Identification and management of potential impacts on other environmental values within surrounding areas
- Management actions and requirements for the management of the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
- Monitoring and reporting requirements for the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values

PMM 7 Prepare a Land Management Plan for Facing Island in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)

PMM 8 Prepare a Land Management Plan for the Priority Port of Gladstone Inshore Islands in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)

PMM 9 Prepare a Land Management Plan for the Mount Larcom Landform in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)

5.7.2 Marine industry and recreation precinct

PMM 2 Prior to undertaking any operational works within the master planned area, proponents who are not operating in accordance with a cultural heritage management plan approved under the *Aboriginal Cultural Heritage Act 2003*, an Indigenous Land Use Agreement registered under the *Native Title Act 1993*, or an agreement with an Aboriginal Party made in accordance with the *Native Title Act 1993*, will notify the traditional owner representative (of the operational works) as part of implementing the 'cultural heritage duty of care' requirements of the *Aboriginal Cultural Heritage Act 2003*

Note: An approved cultural heritage management plan is a plan that has been approved by the chief executive or the Minister under part 7 of the *Aboriginal Cultural Heritage Act 2003*

PMM 4 To consolidate, manage and update every five years all the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental value information and mapping for the master planned area

PMM 5 Prepare a Priority Port of Gladstone Environmental Impact Assessment Guideline which shall include the minimum requirements for development applications, for example including:

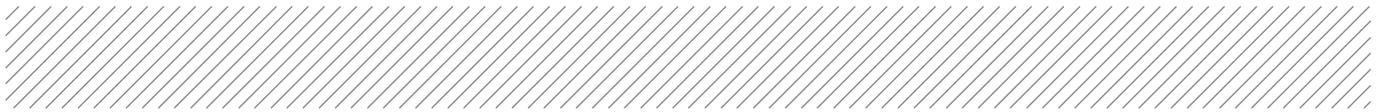
- Project description and design that address the management hierarchy of avoidance, minimisation and/or mitigation of potential impacts on the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
- Background monitoring and reporting requirements (eg environmental values, scope, timeframe) prior to lodging the application to the regulator
- Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within and surrounding the development area for lodgement to the regulator (ie utilising/building upon the information and mapping associated with PMM 4)
- Indigenous cultural heritage requirements
- Identify and assess the potential impacts and risks to achieving the master plan objectives and other legislation objectives
- Management actions and requirements
- Monitoring and reporting requirements during construction and operation

Note: The guideline is to be addressed during preparation of the terms of reference for an environmental impact statement prepared under the *State Development and Public Works Organisation Act 1971*, *Environmental Protection Act 1994* and/or the *Planning Act 2016*.

5.7.3 Interface precinct

PMM 2 Prior to undertaking any operational works within the master planned area, proponents who are not operating in accordance with a cultural heritage management plan approved under the *Aboriginal Cultural Heritage Act 2003*, an Indigenous Land Use Agreement registered under the *Native Title Act 1993*, or an agreement with an Aboriginal Party made in accordance with the *Native Title Act 1993*, will notify the traditional owner representative (of the operational works) as part of implementing the 'cultural heritage duty of care' requirements of the *Aboriginal Cultural Heritage Act 2003*

Note: An approved cultural heritage management plan is a plan that has been approved by the chief executive or the Minister under part 7 of the *Aboriginal Cultural Heritage Act 2003*



PMM 4 To consolidate, manage and update every five years all the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental value information and mapping for the master planned area

5.7.4 Port, industry and supply chain precinct

PMM 2 Prior to undertaking any operational works within the master planned area, proponents who are not operating in accordance with a cultural heritage management plan approved under the *Aboriginal Cultural Heritage Act 2003*, an Indigenous Land Use Agreement registered under the *Native Title Act 1993*, or an agreement with an Aboriginal Party made in accordance with the *Native Title Act 1993*, will notify the traditional owner representative (of the operational works) as part of implementing the 'cultural heritage duty of care' requirements of the *Aboriginal Cultural Heritage Act 2003*

Note: An approved cultural heritage management plan is a plan that has been approved by the chief executive or the Minister under part 7 of the *Aboriginal Cultural Heritage Act 2003*

PMM 3 Where necessary to supplement existing environmental value monitoring and technical reporting, undertake surveys within and surrounding the master plan marine precinct to monitor the health of the following values and habitats:

- Seagrass meadows and macroalgae
- Coral reefs
- Marine fauna and their habitat
- Shorebirds and their habitat

Surveys are to be undertaken every five years

Note: This information is to be incorporated into the mapping and information maintained in PMM 4

PMM 4 To consolidate, manage and update every five years all the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental value information and mapping for the master planned area



PMM 5 Prepare a Priority Port of Gladstone Environmental Impact Assessment Guideline which shall include the minimum requirements for development applications, for example including:

- Project description and design that address the management hierarchy of avoidance, minimisation and/or mitigation of potential impacts on the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
- Background monitoring and reporting requirements (eg environmental values, scope, timeframe) prior to lodging the application to the regulator
- Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within and surrounding the development area for lodgement to the regulator (ie utilising/building upon the information and mapping associated with PMM 4)
- Indigenous cultural heritage requirements
- Identify and assess the potential impacts and risks to achieving the master plan objectives and other legislation objectives
- Management actions and requirements
- Monitoring and reporting requirements during construction and operation

Note: The guideline is to be addressed during preparation of the terms of reference for an environmental impact statement prepared under the *State Development and Public Works Organisation Act 1971*, *Environmental Protection Act 1994* and/or the *Planning Act 2016*.

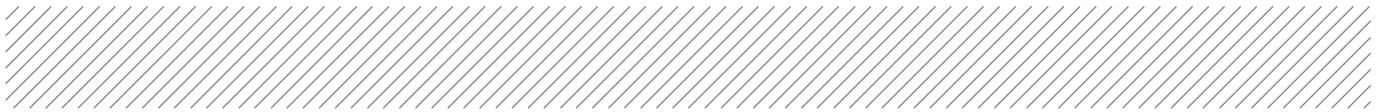
PMM 10 Prepare a Land Management Plan for Lot 87 on SP144431 in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan (refer PMM 6)

Note: This lot is a Reserve located directly adjacent to the southern cadastral boundary of Lot 1 on SP144430 at 293 Mylrea Road, Aldoga

5.7.5 Marine precinct

PMM 2 Prior to undertaking any operational works within the master planned area, proponents who are not operating in accordance with a cultural heritage management plan approved under the *Aboriginal Cultural Heritage Act 2003*, an Indigenous Land Use Agreement registered under the *Native Title Act 1993*, or an agreement with an Aboriginal Party made in accordance with the *Native Title Act 1993*, will notify the traditional owner representative (of the operational works) as part of implementing the 'cultural heritage duty of care' requirements of the *Aboriginal Cultural Heritage Act 2003*

Note: An approved cultural heritage management plan is a plan that has been approved by the chief executive or the Minister under part 7 of the *Aboriginal Cultural Heritage Act 2003*



PMM 3 Where necessary to supplement existing environmental value monitoring and technical reporting, undertake surveys within and surrounding the master plan marine precinct to monitor the health of the following values and habitats:

- Seagrass meadows and macroalgae
- Coral reefs
- Marine fauna and their habitat
- Shorebirds and their habitat

Surveys are to be undertaken every five years

Note: This information is to be incorporated into the mapping and information maintained in PMM 4

PMM 4 To consolidate, manage and update every five years all the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental value information and mapping for the master planned area

PMM 5 Prepare a Priority Port of Gladstone Environmental Impact Assessment Guideline which shall include the minimum requirements for development applications, for example including:

- Project description and design that address the management hierarchy of avoidance, minimisation and/or mitigation of potential impacts on the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
- Background monitoring and reporting requirements (eg environmental values, scope, timeframe) prior to lodging the application to the regulator
- Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within and surrounding the development area for lodgement to the regulator (ie utilising/building upon the information and mapping associated with PMM 4)
- Indigenous cultural heritage requirements
- Identify and assess the potential impacts and risks to achieving the master plan objectives and other legislation objectives
- Management actions and requirements
- Monitoring and reporting requirements during construction and operation

Note: The guideline is to be addressed during preparation of the terms of reference for an environmental impact statement prepared under the *State Development and Public Works Organisation Act 1971*, *Environmental Protection Act 1994* and/or the *Planning Act 2016*.

5.8 Conclusions from the risk assessment process

This section summarises the outcomes (ie PMMs and other port overlay matters content) from the master plan risk assessment process for consideration by DSD and other agencies in drafting the priority Port of Gladstone master plan. This section also contains additional general conclusions for state government consideration during the relevant legislative, planning and/or administrative review and updating process.

The proposed PMMs, potential port overlay matters and additional general conclusions provided below are each numbered for ease of cross-referencing.

5.8.1 Proposed priority management measures

The proposed PMMs for the priority Port of Gladstone master plan are provided below. The PMM justification, potential impacts addressed, relevant draft precincts, implementation mechanism, and responsible and advisory entities are provided in Table 5.7.

- PMM 1 Amend the Gladstone Regional Council Planning Scheme to change the zoning over Mount Larcom landform area to Environmental Management as part of the next Planning Scheme review process
- PMM 2 Prior to undertaking any operational works within the master planned area, proponents who are not operating in accordance with a cultural heritage management plan approved under the *Aboriginal Cultural Heritage Act 2003*, an Indigenous Land Use Agreement registered under the *Native Title Act 1993*, or an agreement with an Aboriginal Party made in accordance with the *Native Title Act 1993*, will notify the traditional owner representative (of the operational works) as part of implementing the 'cultural heritage duty of care' requirements of the *Aboriginal Cultural Heritage Act 2003*
- Note:** An approved cultural heritage management plan is a plan that has been approved by the chief executive or the Minister under part 7 of the *Aboriginal Cultural Heritage Act 2003*
- PMM 3 Where necessary to supplement existing environmental value monitoring and technical reporting, undertake surveys within and surrounding the master plan marine precinct to monitor the health of the following values and habitats:
- Seagrass meadows and macroalgae
 - Coral reefs
 - Marine fauna and their habitat
 - Shorebirds and their habitat
- Surveys are to be undertaken every five years
- Note:** This information is to be incorporated into the mapping and information maintained in PMM 4
- PMM 4 To consolidate, manage and update every five years all the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental value information and mapping for the master planned area

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- PMM 5 Prepare a Priority Port of Gladstone Environmental Impact Assessment Guideline which shall include the minimum requirements for development applications, for example including:
- Project description and design that address the management hierarchy of avoidance, minimisation and/or mitigation of potential impacts on the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
 - Background monitoring and reporting requirements (eg environmental values, scope, timeframe) prior to lodging the application to the regulator
 - Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within and surrounding the development area for lodgement to the regulator (ie utilising/building upon the information and mapping associated with PMM 4)
 - Indigenous cultural heritage requirements
 - Identify and assess the potential impacts and risks to achieving the master plan objectives and other legislation objectives
 - Management actions and requirements
 - Monitoring and reporting requirements during construction and operation
- Note:** The guideline is to be addressed during preparation of the terms of reference for an environmental impact statement prepared under the *State Development and Public Works Organisation Act 1971*, *Environmental Protection Act 1994* and/or the *Planning Act 2016*.

- PMM 6 Prepare a Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline which shall include requirements to:
- Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within the environmental protection precinct areas to be managed (with reference to the data and information collected in PMM 4)
 - Define the objectives and management outcomes of the environmental protection precinct area (Land Management Plan objectives should be consistent with the environmental protection precinct environmental management framework objectives within the master plan)
 - Identify the existing and potential threats and potential risks to achieving the environmental protection precinct objectives and management outcomes
 - Identification and management of potential impacts on other environmental values within surrounding areas
 - Management actions and requirements for the management of the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
 - Monitoring and reporting requirements for the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values
- PMM 7 Prepare a Land Management Plan for Facing Island in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)
- PMM 8 Prepare a Land Management Plan for the Priority Port of Gladstone Inshore Islands in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)

PMM 9 Prepare a Land Management Plan for the Mount Larcom Landform in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)

PMM 10 Prepare a Land Management Plan for Lot 87 on SP144431 in accordance with the *Land Act 1994* and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan (refer PMM 6)

Note: This lot is a Reserve located directly adjacent to the southern cadastral boundary of Lot 1 on SP144430 at 293 Mylrea Road, Aldoga

5.8.2 Port overlay matters

The risk assessment process has also identified other port overlay matters summarised below.

POM 1 The port overlay should consider including a design code which includes measures and other controls to be implemented within the master plan interface precinct and adjacent port, industry and supply chain precinct to minimise noise, vibration, light, visual amenity and air quality impacts from adjoining port and industrial land uses. The justification for the design code is due to the following:

- To ensure the GRC Planning Scheme requires that future residential development within the master plan interface precinct is appropriately located and designed with due consideration of the close proximity to existing and future port and industrial development. Location and design considerations should include measures that minimise and/or mitigate potential noise, light, visual amenity and air quality impacts.
- If the design and location of port activities and adjoining residential dwellings does not appropriately address potential noise, vibration, light, visual amenity and air quality impacts, future residential land uses have the potential to limit the expansion and ongoing operation of port and industrial land uses within areas adjoining the master plan interface precinct.
- To ensure future expansions and new port and industrial developments within the master plan port, industry and supply chain precinct (adjoining the master plan interface precinct and other residential areas) is appropriately designed to minimise and/or mitigate potential noise, vibration, light, visual amenity and air quality impacts on residential and other sensitive land uses within the master plan interface precinct and other residential areas.

POM 2 DSD to consider including PMM implementation and approval timeframes within the port overlay. DSD should also consider including a prioritisation framework for all PMMs to identify the required order of PMM implementation (ie some PMMs are a precursor to other PMMs).

POM 3 The port overlay should consider including a marine precinct code which includes measures and other controls to be implemented by development within the master plan marine precinct. The justification for the code is due to the following:

- To ensure consistency between the design, construction and operation of expanded or new developments within the master plan marine precinct
- To ensure that expansions and new development and operations within the master plan marine precinct are appropriately located, designed and implement mitigation measures with due consideration of the OUV of the GBRWHA and other environmental values within and surrounding the master plan marine precinct, for example including:
 - Seagrass meadows, macroalgae, mangroves and other intertidal vegetation

- Coral reefs (inshore turbid and fringing) and species
- Marine water quality
- Fish and other nekton, marine megafauna, marine turtles and other marine reptiles, macroinvertebrates, shorebirds, migratory birds and seabirds
- Other areas identified as part of confirming, addressing information gaps and documenting the spatial extent and conservation significance of the other environmental values via field surveys and/or recognised expert advice (ie the outputs of PMM 4)

5.8.3 Additional general conclusions

The risk assessment process has also resulted in identifying additional general conclusions below for state government to consider during relevant legislative, planning and/or administrative review and updating processes.

- GC 1 Renaming the environmental protection precinct to environmental management precinct to be consistent with the terminology used in the GSDA Development Scheme. This proposed change in terminology also better reflects the broader management intent (in accord with the principles of ESD) for these areas and associated environmental values.
- GC 2 Inclusion of Lot 87 on SP144431 into the proposed environmental management precinct (ie referred to within this report as the environmental protection precinct). The tenure of this lot is currently 'Reserve', and is described as land reserved by DNRM for community or public purposes. DSD has held discussions with the relevant stakeholders regarding this land parcel and has advised that the management intent of this land parcel is consistent with the intent of the proposed environmental management precinct of the master plan.
- GC 3 DILGP to update the SPP Interactive Mapping System Biodiversity GIS layers to include all of the current mapping of the OUV of the GBRWHA and other environmental values. This will enable GRC to utilise this GIS mapping to update the planning scheme biodiversity overlay.
- GC 4 DSD and DILGP consider updating the SPP to include the OUV of the GBRWHA and other environmental values so that these environmental values can be included in other planning instruments adjoining the GBRWHA (ie through the review and amendment process).
- GC 5 Incorporation of the design code (refer POM 1) into the GRC Planning Scheme during the next review and amendment processes to ensure compatibility in the location and design of future residential development within the master plan interface precinct, and gives due consideration of the close proximity to existing and future port and industrial development.
- GC 6 DTMR (MSQ) undertake a review of their existing policies and procedures for emergency response and disaster management within the marine precinct and update to include consideration of the OUV of the GBRWHA. This may include identification of the OUV of the GBRWHA within the marine precinct and planned response, monitoring and reporting requirements for emergency response and disaster management actions.

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- GC 7 Include a gap analysis component in association with PMM 4 (consolidation, management and updating the OUV of the GBRWHA information and mapping every five years). It is proposed that this gap analysis would be coordinated by DSD (entity responsible for implementing PMM 4) immediately following the consolidation and updating of the OUV of the GBRWHA information and mapping. It is recommended that this gap analysis identify and manage the following:
- Gaps in knowledge or monitoring efforts for a receptor or location which contributes to the OUV of the GBRWHA
 - Required improvements in data collection and management methods or protocols (ie significant variability in data collected, statutory requirements)
 - Review of existing data to determine monitoring requirements and to develop objectives for the next five year period (in consideration of PMM 3)
- GC 8 DSD review the Reef 2050 Integrated Monitoring and Reporting Program Strategy (GBRMPA 2015) and liaise with GBRMPA and other relevant stakeholders to ensure that the monitoring and reporting requirements of PMM 3 do not duplicate that of the Reef 2050 Integrated Monitoring and Reporting Program (RIMReP). Other reporting programs within the master planned area and surrounding areas will also be considered in implementing PMM 3, such as the GHHP Gladstone harbour report card framework.
- GC 9 The requirements of PMM 2 are incorporated into the future amendments of the ACH Act and the Planning Act as a longer term measure to ensure the consistent management of cultural heritage values in Queensland.
- GC 10 The existing Curtis Island GSDA Environmental Management Precinct LMP is reviewed against the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline.
- GC 11 The OUV of the GBRWHA and other environmental values and master plan EMF objectives (where relevant) should be incorporated into the GSDA Development Scheme, GPC Land Use Plan and GRC Planning Scheme during the next review and amendment process.
- GC 12 The Priority Port of Gladstone Impact Assessment Guideline (PMM 5) requirements should be incorporated into the terms of reference for an EIS prepared under the SDPWO Act, EP Act and/or Planning Act.
- GC 13 The Priority Port of Gladstone Impact Assessment Guideline requirements should be incorporated into the GSDA Development Scheme, GPC Land Use Plan and GRC Planning Scheme during the next review and amendment process.
- GC 14 Further consideration be given to the management of stormwater runoff within the master planned area and upstream catchment areas. Specifically, where there is a change in land management practices, or a change or intensification in land use, this should trigger the review and updating of stormwater runoff management measures for the development area. The measures should avoid or minimise the chemical, nutrient and sediment loads of stormwater runoff to a level appropriate to minimise impacts to the downstream OUV of the GBRWHA and other environmental values within the master planned area and surrounds.

Table 5.7 Priority Port of Gladstone master planning recommended priority management measures

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply				Implementation mechanism	Entity responsible for implementing	Advisory entity/entities
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct			
PMM 1	Amend the Gladstone Regional Council Planning Scheme to change the zoning over Mount Larcom landform area to Environmental Management as part of the next Planning Scheme review process	<p>The Gladstone Regional Council (GRC) Planning Scheme (PS) requires amendment due to the following:</p> <ul style="list-style-type: none"> The current GRC PS zoning over the Mount Larcom landform is Rural, which does not recognise the existing environmental values within the area To ensure the Mount Larcom landform area only allows nature based recreation that is consistent with the Environmental Management zone and the area is managed in accordance with the objectives of the master plan environmental protection precinct (EPP) To minimise and manage the potential direct (nature based recreation) impacts to the environmental values within the EPP area and indirect (from nearby development within the Gladstone State Development Area (GSDA)) impacts to the environmental values within the master plan EPP area (refer potential impacts column of this table) 	<p>Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and/or fauna habitat associated with Mount Larcom</p> <p>Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas of Mount Larcom due to vegetation clearing</p> <p>Direct mortality and/or injury to terrestrial fauna at Mount Larcom (eg vehicle or machinery strike, clearing activities)</p> <p>Increased edge effects on adjacent terrestrial vegetation communities and/or fauna habitat, reducing the condition and/or quality of adjacent environments associated with Mount Larcom</p> <p>Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or fauna habitat associated with Mount Larcom</p>	Yes	No	No	No	No	DILGP	
PMM 2	Prior to undertaking any operational works within the master planned area, proponents who are not operating in accordance with a cultural heritage management plan approved under the <i>Aboriginal Cultural Heritage Act 2003</i> , an Indigenous Land Use Agreement registered under the <i>Native Title Act 1993</i> , or an agreement with an Aboriginal Party made in accordance with the <i>Native Title Act 1993</i> , will notify the traditional owner representative (of the operational works) as part of implementing the 'cultural heritage duty of care' requirements of the <i>Aboriginal Cultural Heritage Act 2003</i> Note: An approved cultural heritage management plan is a plan that has been approved by the chief executive or the Minister under part 7 of the <i>Aboriginal Cultural Heritage Act 2003</i>	<p>The notification process in this PMM is required to enable the consistent implementation of the 'cultural heritage duty of care' under the <i>Aboriginal Cultural Heritage Act 2003</i> (ACH Act). This notification process will facilitate:</p> <ul style="list-style-type: none"> Consistency in the management of cultural heritage across planning and approval processes within the master planned area Consistent involvement of Traditional Owners in the management of cultural heritage within the master planned area Consistency in the management of cultural heritage across terrestrial, intertidal and marine areas within the master planned area Education and awareness of cultural heritage management 	<p>Direct impacts on cultural heritage sites and loss of Traditional Owner access to land as a result of construction and/or operation of developments and infrastructure within the master planned area</p>	Yes	Yes	Yes	Yes	Yes	Proponent undertaking operational works	DATSIP

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply					Implementation mechanism	Entity responsible for implementing	Advisory entity/entities
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct			
PMM 3	Where necessary to supplement existing environmental value monitoring and technical reporting, undertake surveys within and surrounding the master plan marine precinct to monitor the health of the following values and habitats: <ul style="list-style-type: none"> Seagrass meadows and macroalgae Coral reefs Marine fauna and their habitat Shorebirds and their habitat Surveys are to be undertaken every five years Note: This information is to be incorporated into the mapping and information maintained in PMM 4	<p>Gladstone Ports Corporation (GPC) Ecosystem Research and Monitoring Program (ERMP) surveys are proposed to finish at the timeframes below:</p> <ul style="list-style-type: none"> Seagrass meadow surveys – November 2018 Dugong feeding ecology and habitat use – February 2017 Migratory shorebird surveys – March 2018 Turtle surveys – 2020 Monitoring the survival and recovery of shorelines (tidal wetlands) – May 2021 <p>These surveys are required to continue during the master plan timeframe to monitor, report and increase the understanding of the health and presence of seagrass meadows, coral reefs and marine fauna and shorebird habitat within and surrounding the master planned area</p> <p>The findings of these surveys will also assist in the development of actions and measures for the future management of the outstanding universal value (OUV) of the Great Barrier Reef World Heritage Area (GBRWHA) and other environmental values within the master planned area</p> <p>Gladstone Healthy Harbour Partnership (GHHP) and the Port Curtis Integrated Monitoring Program (PCIMP) to continue to summarise Gladstone harbour health via their existing reporting process. It is also intended that this PMM is undertaken in consideration of Reef 2050 Integrated Monitoring and Reporting Program (RIMReP)</p>	<p>Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of intertidal flora species, vegetation communities, benthic communities, coral reefs, intertidal fauna habitat and/or marine fauna habitat</p> <p>Increase in noise and vibration and potential disruption to behaviour/life-cycle of terrestrial, intertidal and marine fauna</p> <p>Direct mortality and/or injury to intertidal and/or marine fauna as a result of vessel strike</p> <p>Increase in construction and operational noise, vibration, and lighting resulting in disruption to behaviour/life-cycle of intertidal and marine fauna</p> <p>Erosion, sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality</p> <p>Sedimentation and decreased water quality in adjacent intertidal and marine areas resulting in decreased condition and/or quality of adjacent intertidal and marine environments as a result of the dredging plume or release of contaminants (eg spills)</p>	Yes (Facing Island)	No	No	Yes	Yes	Operational	DSD	GPC, DoE, GBRMPA, EHP, DNPSR, DAF, DSITI and GHHP

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply					Implementation mechanism	Entity responsible for implementing	Advisory entity/entities
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct			
PMM 4	To consolidate, manage and update every five years all the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental value information and mapping for the master planned area	<p>The consolidation of environmental value information and mapping for the master planned area is required due to the following:</p> <ul style="list-style-type: none"> To ensure consistency in describing and mapping of the OUV of the GBRWHA and other environmental values during the review and amendment of statutory land use plans, and approval processes To ensure development applications within the master planned area utilise consistent available information on the OUV of the GBRWHA and other environmental values in their assessment of the potential direct and indirect impacts To ensure additional OUV of the GBRWHA and other environmental values information and mapping is updated every five years during the master plan timeframe <p>It is intended that this PMM is undertaken in consideration of the RIMRep, the Water Tracking and Electronic Reporting System (WaTERS) and other relevant data collection and maintenance programs.</p>	All direct and indirect impacts on values that contribute to the OUV of the GBRWHA	Yes	Yes	Yes	Yes	Yes	DSD	GPC, DSITI, EHP, DAF, DNRM, DNPSR, GHHP, GBRMPA and GRC	

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed					Master planned area draft precincts to which the PMM is likely to apply				Implementation mechanism	Entity responsible for implementing	Advisory entity/entities
			Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct							
PMM 5	<p>Prepare a Priority Port of Gladstone Environmental Impact Assessment Guideline which shall include the minimum requirements for development applications, for example including:</p> <ul style="list-style-type: none"> Project description and design that address the management hierarchy of avoidance, minimisation and/or mitigation of potential impacts on the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values Background monitoring and reporting requirements (eg environmental values, scope, timeframe) prior to lodging the application to the regulator Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within and surrounding the development area for lodgement to the regulator (ie utilising/building upon the information and mapping associated with PMM 4) Indigenous cultural heritage requirements Identify and assess the potential impacts and risks to achieving the master plan objectives and other legislation objectives Management actions and requirements Monitoring and reporting requirements during construction and operation <p>Note: The guideline is to be addressed during preparation of the terms of reference for an environmental impact statement prepared under the <i>State Development and Public Works Organisation Act 1971</i>, <i>Environmental Protection Act 1994</i> and/or the <i>Planning Act 2016</i>.</p>	<p>The Priority Port of Gladstone (PPG) Environmental Impact Assessment (EIA) Guideline is required due to the following:</p> <ul style="list-style-type: none"> To ensure consistency in the background monitoring, describing and mapping environmental values, and assessing and managing environmental impacts on environmental values under the <i>State Development and Public Works Organisation Act 1971</i> (SDPWO Act), GSDA Development Scheme, GPC Land Use Plan (LUP), GRC PS, <i>Environmental Protection Act 1994</i> (EP Act), <i>Nature Conservation Act 1992</i> (NC Act), <i>Coastal Protection and Management Act 1995</i> (CPM Act), <i>Petroleum and Gas (Production and Safety) Act 2004</i> (P&G Act), <i>Vegetation Management Act 1999</i> (VM Act), <i>Water Act 2000</i> (Water Act), <i>Fisheries Act 1994</i> (Fisheries Act), <i>Transport Infrastructure Act 1994</i> (TI Act) To ensure consistency between the design, construction and operation of expanded or new developments within marine precinct (MP), port, industry and supply chain precinct (PISCP) and marine industry and recreation precinct (MIRP) within the master planned area To ensure that potential direct impacts are avoided and potential indirect impacts are minimised and managed at the Pelican Banks North, Pelican Banks South, Facing Island and Quoin Island seagrass meadows, as they contribute significantly to the expression of the OUV of the GBRWHA within the master planned area To ensure that expansions and new development and operations within the master plan MP, PISCP and MIRP are appropriately located, designed and implement mitigation measures (to address potential impacts summarised in the adjoining column within this table) with due consideration of the OUV of the GBRWHA and other environmental values within and surrounding the master plan MP, for example including: <ul style="list-style-type: none"> Seagrass meadows, macroalgae, mangroves and other intertidal vegetation Shorebirds, migratory seabirds and other migratory bird species (eg woodland or freshwater wetland migrants) and their habitat (eg roosting and foraging habitat) 	<p>Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities, fauna habitat, seagrass meadows, benthic communities and/or coral reefs</p> <p>Direct mortality and/or injury to intertidal and /or marine fauna as a result of vessel strike</p> <p>Increased edge effects on adjacent terrestrial and/or intertidal flora species, vegetation communities and terrestrial, intertidal and/or marine fauna habitat, reducing the condition and/or quality of adjacent environments</p> <p>Increase in construction and operational lighting and noise resulting in disruption to behaviour/life-cycle of terrestrial, intertidal, and marine fauna</p> <p>Introduction or spread of weed and pest species reducing the quality and/or condition of terrestrial and/or intertidal vegetation communities, and fauna habitat</p> <p>Increase in dust impacts on adjacent terrestrial and intertidal vegetation communities, and terrestrial, intertidal and marine fauna habitat reducing the condition and quality of adjacent habitats</p> <p>Increased dust impacts in surrounding areas resulting in reduced air quality</p> <p>Sedimentation and decreased water quality in adjacent terrestrial, intertidal and marine areas resulting in decreased condition and/or quality</p> <p>Increased edge effects on important foraging/roosting habitat for shorebirds</p> <p>Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas</p> <p>Direct impacts on cultural heritage sites and loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure</p>	No	Yes	No	Yes	Yes	DSD	GPC, GRC, DAF, EHP, DSITI, DILGP, DTMR, DNRMI, DNPSR, DoE and JCU TropWATER				



PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply					Implementation mechanism	Entity responsible for implementing	Advisory entity/entities
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct			
		<ul style="list-style-type: none"> - Coral reefs (inshore turbid and fringing) and species - Marine water quality - Fish and other nekton, marine megafauna, marine turtles and other marine reptiles, macroinvertebrates, shorebirds, migratory birds and seabirds - Rodds Bay Dugong Protection Area - Other areas identified as part of confirming, addressing information gaps and documenting the spatial extent and conservation significance of the other environmental values via field surveys and/or recognised expert advice (ie the outputs of PMM 4) 		Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct			

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply					Implementation mechanism	Entity responsible for implementing	Advisory entity/entities	
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct				
PMM 6	<p>Prepare a Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline which shall include requirements to:</p> <ul style="list-style-type: none"> Describe and map the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values within the environmental protection precinct areas to be managed (with reference to the data and information collected in PMM 4) Define the objectives and management outcomes of the environmental protection precinct area (Land Management Plan objectives should be consistent with the environmental protection precinct environmental management framework objectives within the master plan) Identify the existing and potential threats and potential risks to achieving the environmental protection precinct objectives and management outcomes Identification and management of potential impacts on other environmental values within surrounding areas Management actions and requirements for the management of the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values Monitoring and reporting requirements for the outstanding universal value of the Great Barrier Reef World Heritage Area and other environmental values 	<p>A PPG EPP Land Management Plan (LMP) Guideline (PPG EPP LMP Guideline) is required due to the following:</p> <ul style="list-style-type: none"> To ensure the Land Management Plans (LMPs) for the EPP areas are consistent within the master planned area To ensure sufficient background information and management actions/requirements are included within LMPs that manage the: <ul style="list-style-type: none"> Potential direct and indirect impacts to the OUV of the GBRWHA and other environmental values within the master plan EPP area Potential indirect impacts to the surrounding OUV of the GBRWHA and other environmental values (refer potential impacts column of this table) 	<p>Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial and intertidal flora species, vegetation communities and/or fauna habitat on the master planned area islands</p> <p>Direct mortality and/or injury to terrestrial and/or intertidal fauna on the master planned area islands (eg vehicle or machinery strike, clearing activities)</p> <p>Increase in noise and disruption to behaviour/life-cycle of terrestrial and intertidal fauna on the master planned area islands</p> <p>Increased edge effects on adjacent terrestrial and intertidal vegetation communities, fauna habitat, important nesting habitat for marine turtles and/or foraging/roosting habitat for shorebirds, reducing the condition and/or quality of adjacent environments on the master planned area islands</p> <p>Increase in operational lighting impacting on terrestrial, intertidal, and/or marine fauna on the master planned area islands</p> <p>Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial and intertidal vegetation communities and/or fauna habitat on the master planned area islands</p> <p>Sedimentation and decreased water quality in terrestrial and marine areas resulting in decreased condition and/or quality of environments associated with the master planned area islands</p> <p>Decrease in visual amenity for residents, recreational users and tourists accessing the master planned area islands and surrounding areas as a result of construction activities associated with recreational infrastructure</p> <p>Disruption to terrestrial and intertidal fauna behaviour and/or life-cycle due to increased potential for human interaction on the master planned area islands</p> <p>Direct impacts on cultural heritage sites and loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure</p>	Yes	No	No	No	No	No	Operational	DNRM	GPC, EHP, DAF, DNPSR, DSITI, GRC and DoE

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply					Implementation mechanism	Entity responsible for implementing	Advisory entity/entities	
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct				
PMM 7	Prepare a Land Management Plan for Facing Island in accordance with the <i>Land Act 1994</i> and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)	<p>The Facing Island LMP is required due to the following:</p> <ul style="list-style-type: none"> ■ To ensure the LMPs for the EPP areas are consistent within the master planned area ■ To ensure sufficient background information and management actions/requirements are included within the LMP that: <ul style="list-style-type: none"> – Avoid direct impacts on very high sensitivity environmental values (eg endangered under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)) within the master plan EPP – Minimise and manage the potential direct and indirect impacts on high, moderate and low sensitivity environmental values within the master plan EPP – Minimise and manage the potential indirect impacts to the surrounding environmental values (refer potential impacts column of this table). <p>Examples of the OUV attributes of the GBRWHA to be included in the LMP include:</p> <ul style="list-style-type: none"> ■ Marine turtle nesting beaches ■ Conservation significant fauna habitat ■ Island vegetation and fauna species diversity ■ Dune systems ■ Other areas identified as part of confirming, addressing information gaps and documenting the spatial extent and conservation significance of the other environmental values via field surveys and/or recognised expert advice (ie as part of preparing the LMP and also the output of PMM 4) 	As above	Yes	No	No	No	No	No	Operational	GPC	EHP, DAF, DNPSR, DSITI and GRC

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply					Implementation mechanism	Entity responsible for implementing	Advisory entity/entities	
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct				
PMM 8	Prepare a Land Management Plan for the Priority Port of Gladstone Inshore Islands in accordance with the <i>Land Act 1994</i> and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)	<p>The PPG Inshore Islands LMP is required due to the following:</p> <ul style="list-style-type: none"> ■ To ensure the LMPs for the EPP areas are consistent within the master planned area ■ To ensure sufficient background information and management actions/requirements are included within the LMP that: <ul style="list-style-type: none"> – Avoid direct impacts on very high sensitivity environmental values (eg endangered under the EPBC Act) within the master plan EPP – Minimise and manage the potential direct and indirect impacts on high, moderate and low sensitivity environmental values within the master plan EPP – Minimise and manage the potential indirect impacts to the surrounding environmental values (refer potential impacts column of this table). <p>Examples of the OUV attributes of the GBRWHA to be included in the LMP include:</p> <ul style="list-style-type: none"> ■ Habitat for threatened flora and fauna species ■ Shorebird habitat ■ Threatened ecological communities (eg Coastal saltmarsh) ■ Intertidal flora and fauna communities (including mangroves) ■ Adjacent seagrass meadows ■ Adjacent inshore turbid reefs and/or fringing reefs ■ Other areas identified as part of confirming, addressing information gaps and documenting the spatial extent and conservation significance of the other environmental values via field surveys and/or recognised expert advice (ie the output of PMM 4) 	As above	Yes	No	No	No	No	No	Operational	GRC	EHP, DAF, DSITI, DNPSR, GPC and land owners

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply					Implementation mechanism	Entity responsible for implementing	Advisory entity/entities
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct	Marine precinct			
PMM 9	Prepare a Land Management Plan for the Mount Larcom Landform in accordance with the <i>Land Act 1994</i> and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan Guideline (refer PMM 6)	<p>The PPG Mount Larcom Landform LMP is required due to the following:</p> <ul style="list-style-type: none"> ■ To ensure the LMPs for the EPP areas are consistent within the master planned area ■ To ensure sufficient background information and management actions/requirements are included within the LMP that: <ul style="list-style-type: none"> – Avoid direct impacts on very high sensitivity environmental values (eg endangered under the EPBC Act) within the master plan EPP – Minimise and manage the potential direct and indirect impacts on high, moderate and low sensitivity environmental values within the master plan EPP – Minimise and manage the potential indirect impacts to the surrounding environmental values (refer potential impacts column of this table). <p>Examples of the environmental values to be included in the LMP include:</p> <ul style="list-style-type: none"> ■ Habitat for threatened flora and fauna species ■ Endangered and Of concern Regional Ecosystems ■ Connectivity and fauna movement corridor values ■ Indigenous and non Indigenous cultural heritage values ■ Other areas identified as part of confirming, addressing information gaps and documenting the spatial extent and conservation significance of the other environmental values via field surveys and/or recognised expert advice (ie the output of PMM 4) 	<p>Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and/or fauna habitat associated with Mount Larcom</p> <p>Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas of Mount Larcom due to vegetation clearing</p> <p>Direct mortality and/or injury to terrestrial fauna at Mount Larcom (eg vehicle or machinery strike, clearing activities)</p> <p>Increased edge effects on adjacent terrestrial vegetation communities and/or fauna habitat, reducing the condition and/or quality of adjacent environments associated with Mount Larcom</p> <p>Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or fauna habitat associated with Mount Larcom</p> <p>Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna associated with Mount Larcom</p> <p>Increase in operational lighting impacting on terrestrial fauna associated with Mount Larcom</p> <p>Disruption to terrestrial fauna behaviour and/or life-cycle due to increased potential for human interaction as a result of an increase in the number of recreational visitors and tourists accessing Mount Larcom</p> <p>Increased levels of waste materials resulting in reduced terrestrial fauna habitat condition and/or quality due to increased recreational visitors and tourists to Mount Larcom</p> <p>Direct impacts on cultural heritage sites and loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure</p>	Yes	No	No	No	No	Operational	DNRM/DNPSR	DSITI, EHP, GRC, DILGP (EDQ) and DSD (OCG)

PMM cross-reference	Recommended PMM	Justification for PMM	Potential impact on environmental values to be addressed	Master planned area draft precincts to which the PMM is likely to apply				Implementation mechanism	Entity responsible for implementing	Advisory entity/entities
				Environmental protection precinct	Marine industry and recreation precinct	Interface precinct	Port, industry and supply chain precinct			
PMM 10	Prepare a Land Management Plan for Lot 87 on SP144431 in accordance with the Land Act 1994 and the Priority Port of Gladstone Environmental Protection Precinct Land Management Plan (refer PMM 6) Note: This lot is a Reserve located directly adjacent to the southern cadastral boundary of Lot 1 on SP144430 at 293 Myreia Road, Aldoga	The PPG Lot 87 on SP144431 LMP is required due to the following: <ul style="list-style-type: none"> To ensure the LMPs for different areas are consistent within the master planned area To ensure sufficient background information and management actions/requirements are included within the LMP that: <ul style="list-style-type: none"> Avoid direct impacts on very high sensitivity environmental values (eg endangered under the EPBC Act) within the LMP area Minimise and manage the potential direct and indirect impacts on high, moderate and low sensitivity environmental values within the LMP area Minimise and manage the potential indirect impacts to the surrounding environmental values (refer potential impacts column of this table). Examples of the environmental values to be included in the LMP include: <ul style="list-style-type: none"> Habitat for threatened flora and fauna species Endangered and Of concern Regional Ecosystems Connectivity and fauna movement corridor values Indigenous and non Indigenous cultural heritage values Other areas identified as part of confirming, addressing information gaps and documenting the spatial extent and conservation significance of the other environmental values via field surveys and/or recognised expert advice (ie the output of PMM 4) 	Direct disturbance resulting in the loss, fragmentation or loss of connectivity values of terrestrial flora species, vegetation communities and/or fauna habitat associated with Lot 87 on SP144431 Decrease in visual amenity for residents, recreational users and tourists accessing the surrounding areas of Lot 87 on SP144431 due to vegetation clearing Direct mortality and/or injury to terrestrial fauna at Lot 87 on SP144431 (eg vehicle or machinery strike, clearing activities) Increased edge effects on adjacent terrestrial vegetation communities and/or fauna habitat , reducing the condition and/or quality of adjacent environments associated with Lot 87 on SP144431 Introduction or spread of pest and weed species resulting in reduced condition and/or quality of terrestrial vegetation communities and/or fauna habitat associated with Lot 87 on SP144431 Increase in noise and disruption to behaviour/life-cycle of terrestrial fauna associated with Lot 87 on SP144431 Increase in operational lighting impacting on terrestrial fauna associated with Lot 87 on SP144431 Disruption to terrestrial fauna behaviour and/or life-cycle due to increased potential for human interaction as a result of an increase in the number of recreational visitors and tourists accessing Lot 87 on SP144431 Increased levels of waste materials resulting in reduced terrestrial fauna habitat condition and/or quality due to increased recreational visitors and tourists to Lot 87 on SP144431 Direct impacts on cultural heritage sites and loss of Traditional Owner access to land as a result of construction and/or operation of infrastructure	No	No	No	Yes	No	DILGP (EDO)	EHP, DSITI, DSD (OCG) and GRC

Table notes:

Precincts:
EPP = Environmental protection precinct
MIRP = Marine industry and recreation precinct
IP = Interface precinct
PISCP = Port, industry and supply chain precinct
MP = Marine precinct

DAF = Department of Agriculture and Fisheries
DATSP = Department of Aboriginal and Torres Strait Islander Partnerships
DILGP = Department of Infrastructure, Local Government and Planning
DNPSR = Department of National Parks, Sport and Racing
DNRM = Department of Natural Resources and Mines
DoE = Department of the Environment
DSD = Department of State Development
DSITI = Department of Science, Information Technology and Innovation
DTMR = Department of Transport and Main Roads
EDQ = Economic Development Queensland
EHP = Department of Environment and Heritage Protection
EIA = Environmental Impact Assessment
LMP = Land Management Plan
ERMPP = Ecosystem Research and Monitoring Program
GBRWPA = Great Barrier Reef Marine Park Authority

GBRWHA = Great Barrier Reef World Heritage Area
GHHP = Gladstone Healthy Harbour Partnership
GFC = Gladstone Ports Corporation
GFC LUP = GFC 2012 Land Use Plan
GRC = Gladstone Regional Council
GRC PS = Gladstone Regional Council Planning Scheme
GSDA DS = Gladstone State Development Area Development Scheme
JCU TropWATER = James Cook University TropWATER Centre for Tropical Water and Aquatic Ecosystem Research
OCG = Office of the Coordinator-General
OUV = outstanding universal value
PCIMP = Port Curtis Integrated Monitoring Program
PMM = Priority management measure
RIMRep = Reef 2050 Integrated Monitoring and Reporting Program
PPG = Priority Port of Gladstone
WATERS = Water Tracking and Electronic Reporting System

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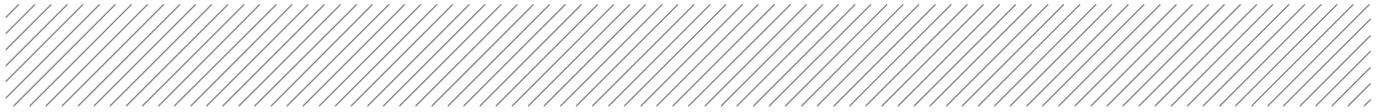
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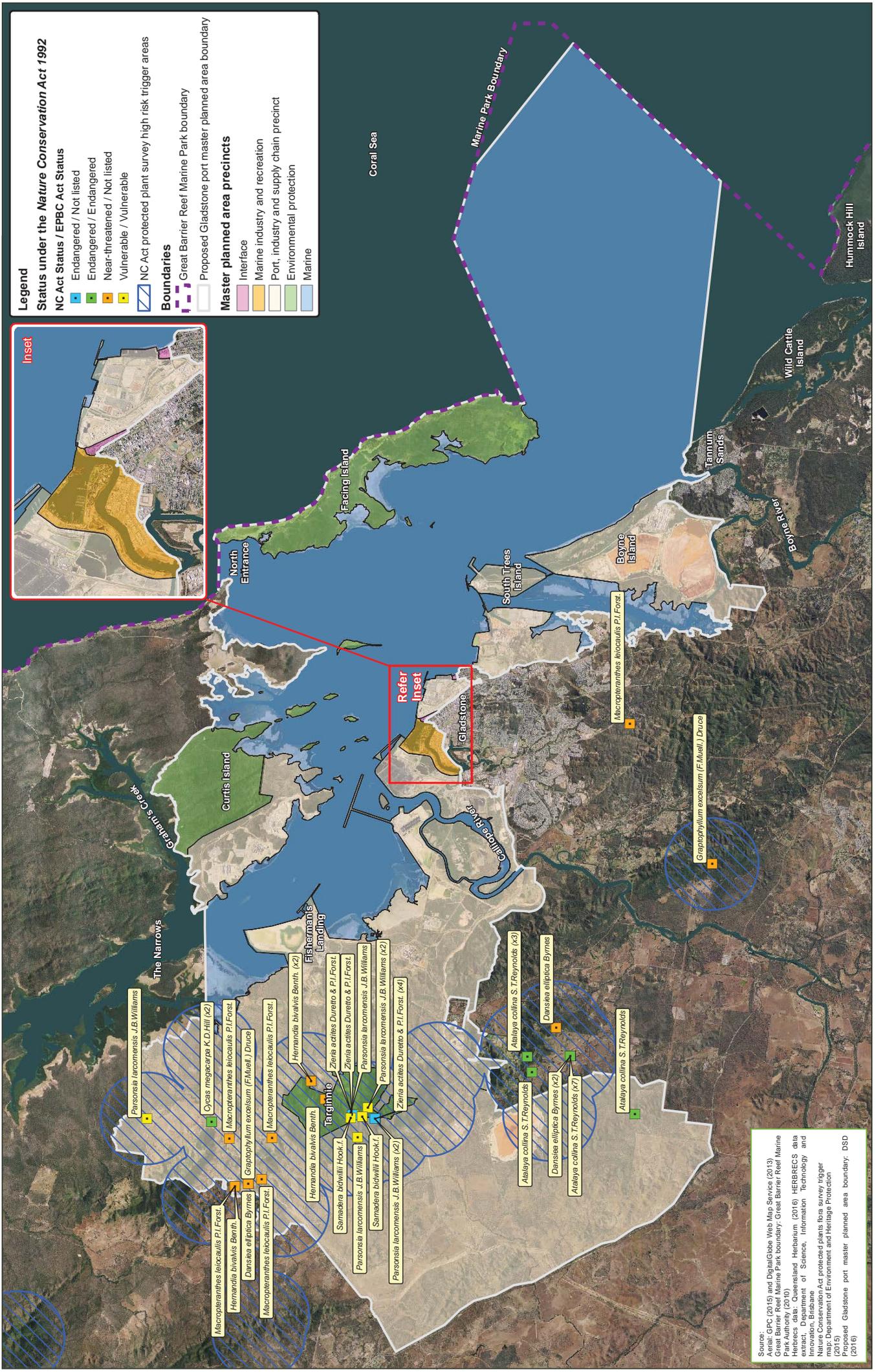
Appendices





Appendix A

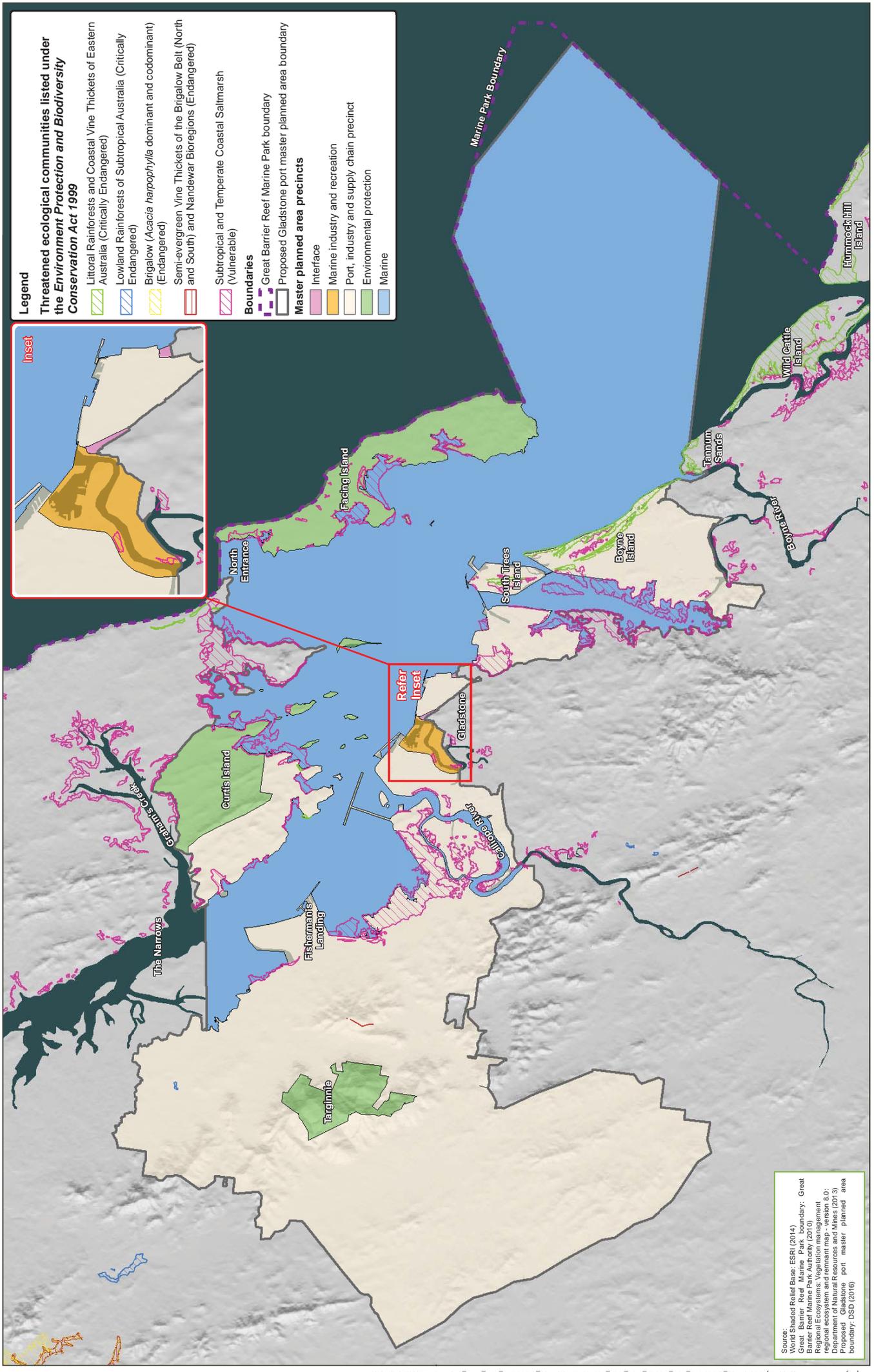
Environmental value maps



Gladstone port master planning risk assessment

Figure A.1: Nature Conservation Act 1992 listed threatened flora species records from HerbreCs database and protected plant survey 'high risk' trigger areas

Date: 22/08/2016 Version: 4 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

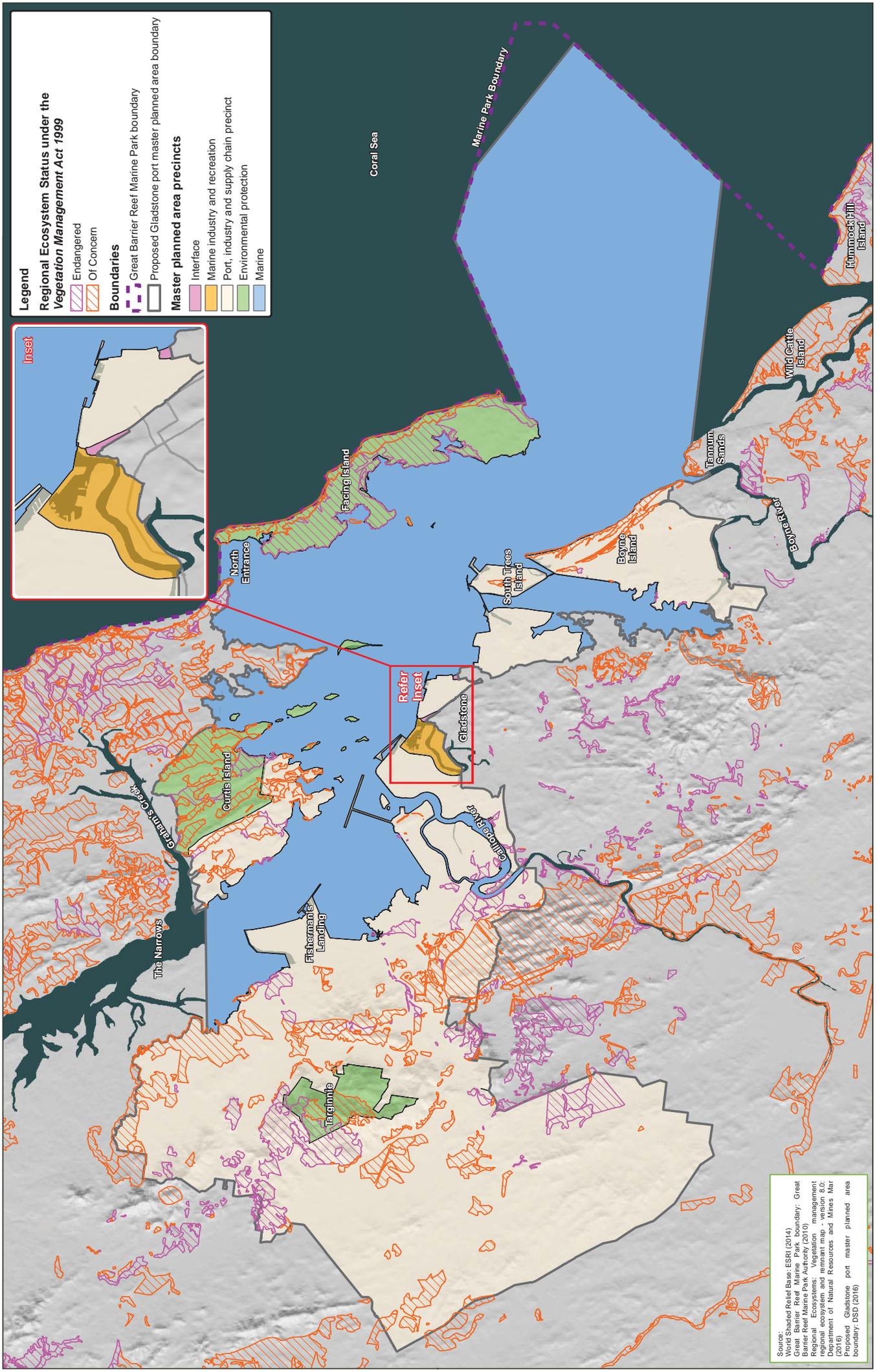


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 Regional Ecosystems: Vegetation management regional ecosystem and remnant map - version 8.0; Department of Environment and Heritage (2010)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 6 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Figure A.2: Threatened ecological communities listed under the Environment Protection and Biodiversity Conservation Act 1999
 Gladstone port master planning risk assessment



Legend

Regional Ecosystem Status under the Vegetation Management Act 1999

- Endangered
- Of Concern

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

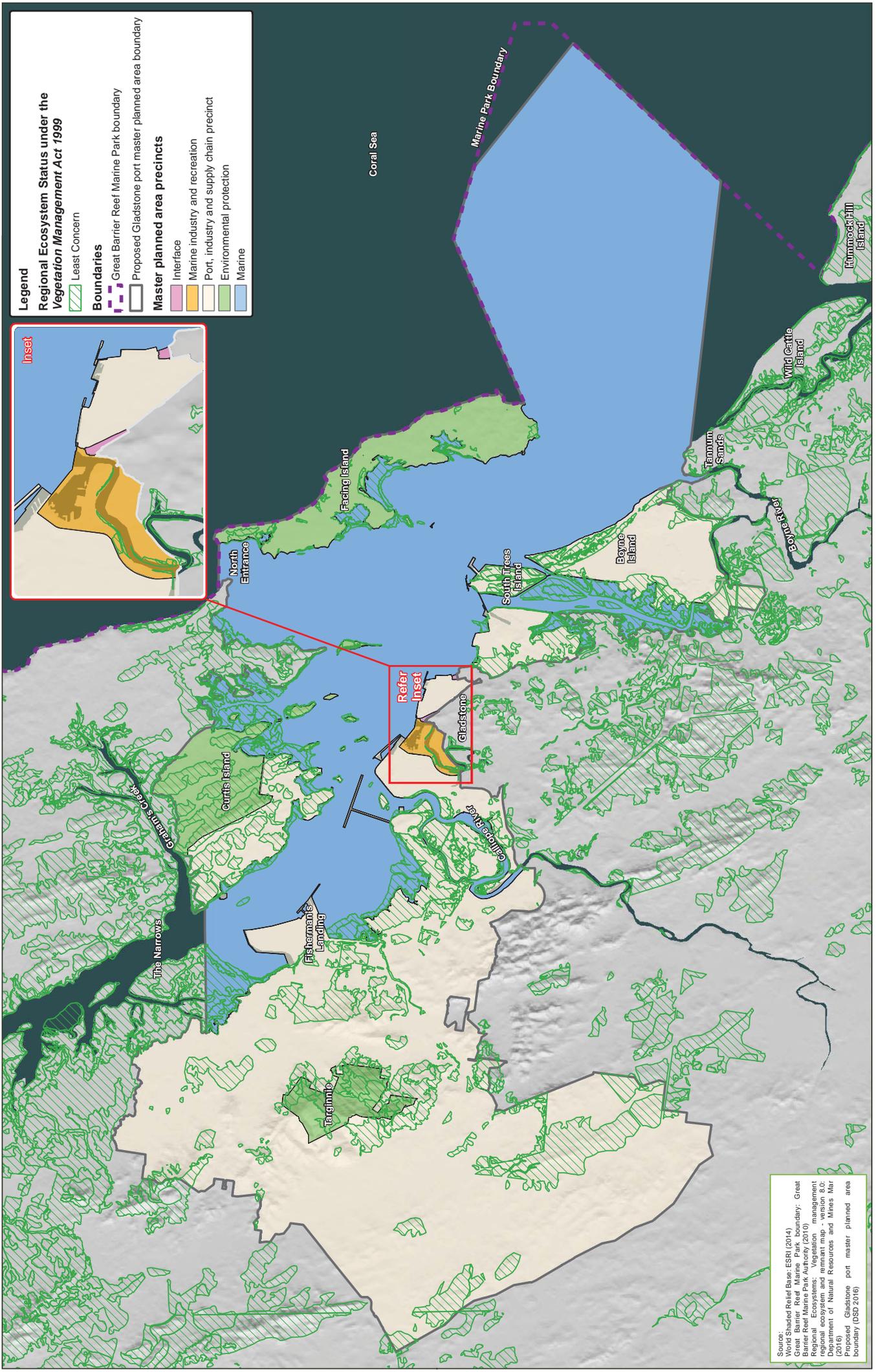
Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain precinct
- Environmental protection
- Marine

Source: World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park Boundary: Great Barrier Reef Marine Park Authority (2010)
 Regional Ecosystems: Vegetation management regional ecosystem and remnant map - version 8.0; Department of Natural Resources and Mines Mar (2016)
 Gladstone port master planned area boundary: DSD (2016)



Figure A.3: Endangered and Of concern Regional Ecosystems as listed under the Vegetation Management Act 1999
 Gladstone port master planning risk assessment



Legend

Regional Ecosystem Status under the Vegetation Management Act 1999

- Least Concern

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain precinct
- Environmental protection
- Marine

Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority
 Regional Ecosystems: Vegetation Management Act 1999
 Regional ecosystem and remnant map - version 8.0: Department of Natural Resources and Mines Mar (2016)
 Gladstone port master planned area boundary (DSD 2016)

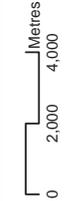
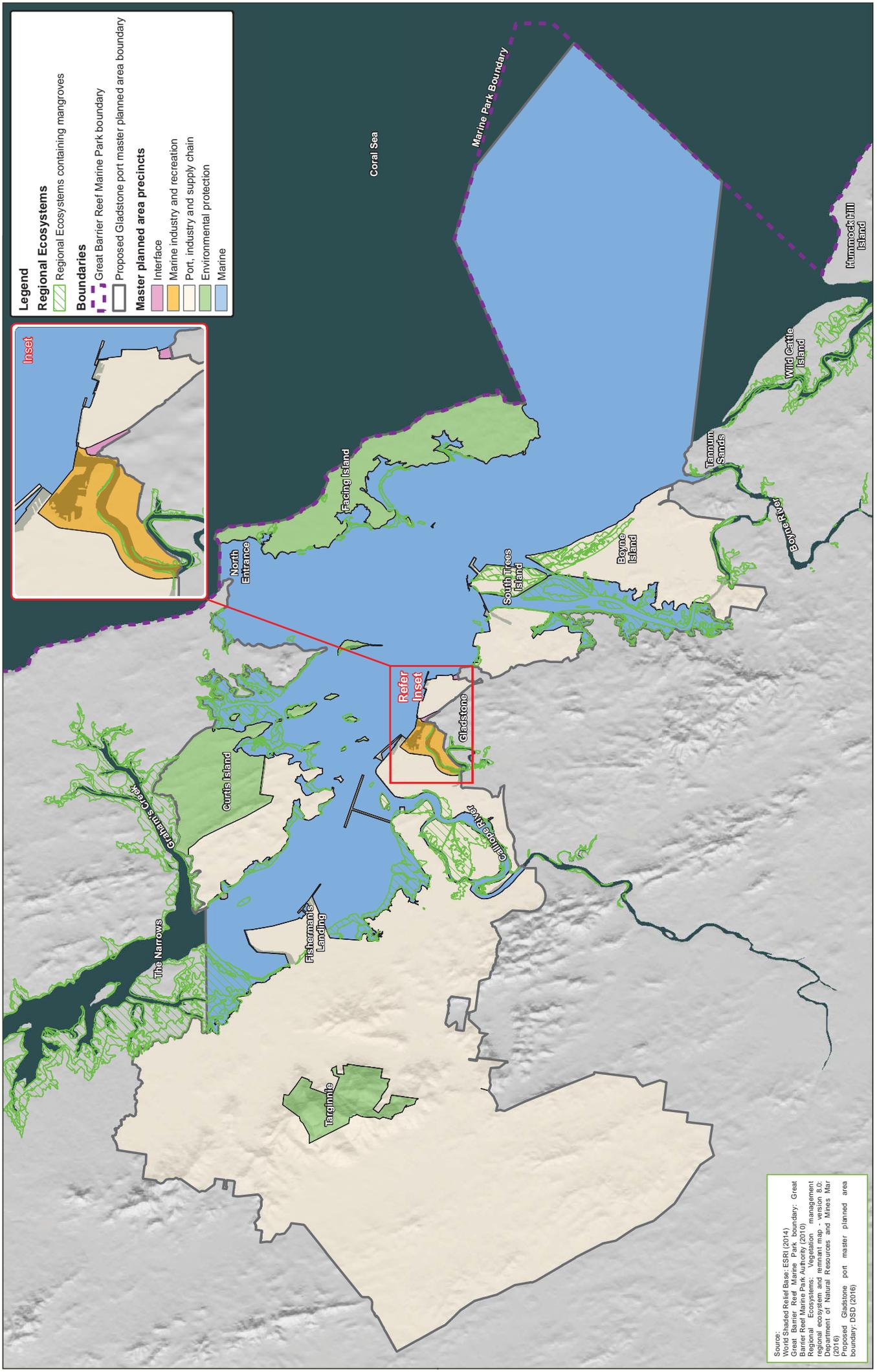


Figure A.4: Least concern Regional Ecosystems as listed under the Vegetation Management Act 1999
 Gladstone port master planning risk assessment



Legend

Regional Ecosystems

- Regional Ecosystems containing mangroves

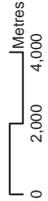
Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

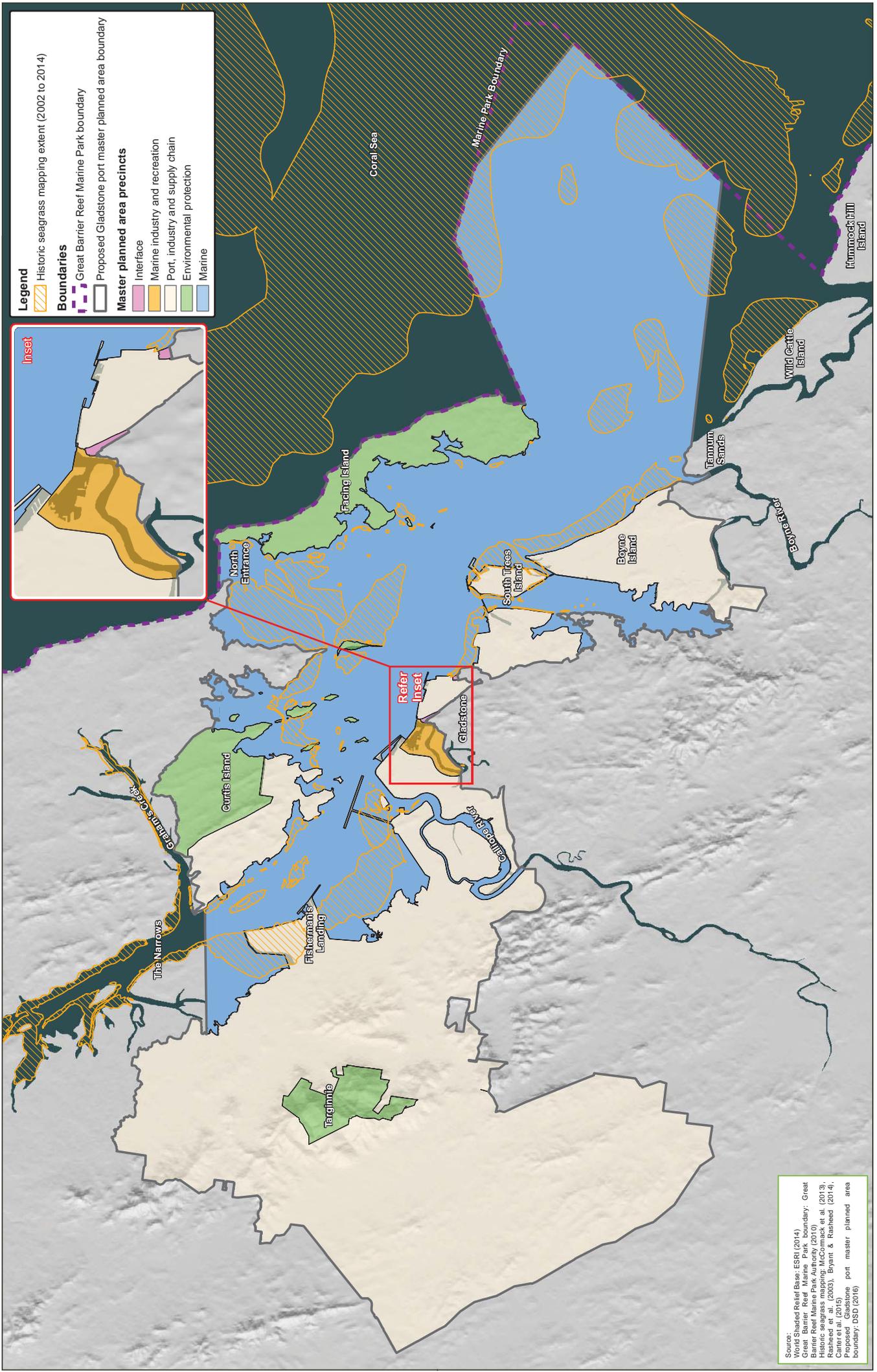
Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

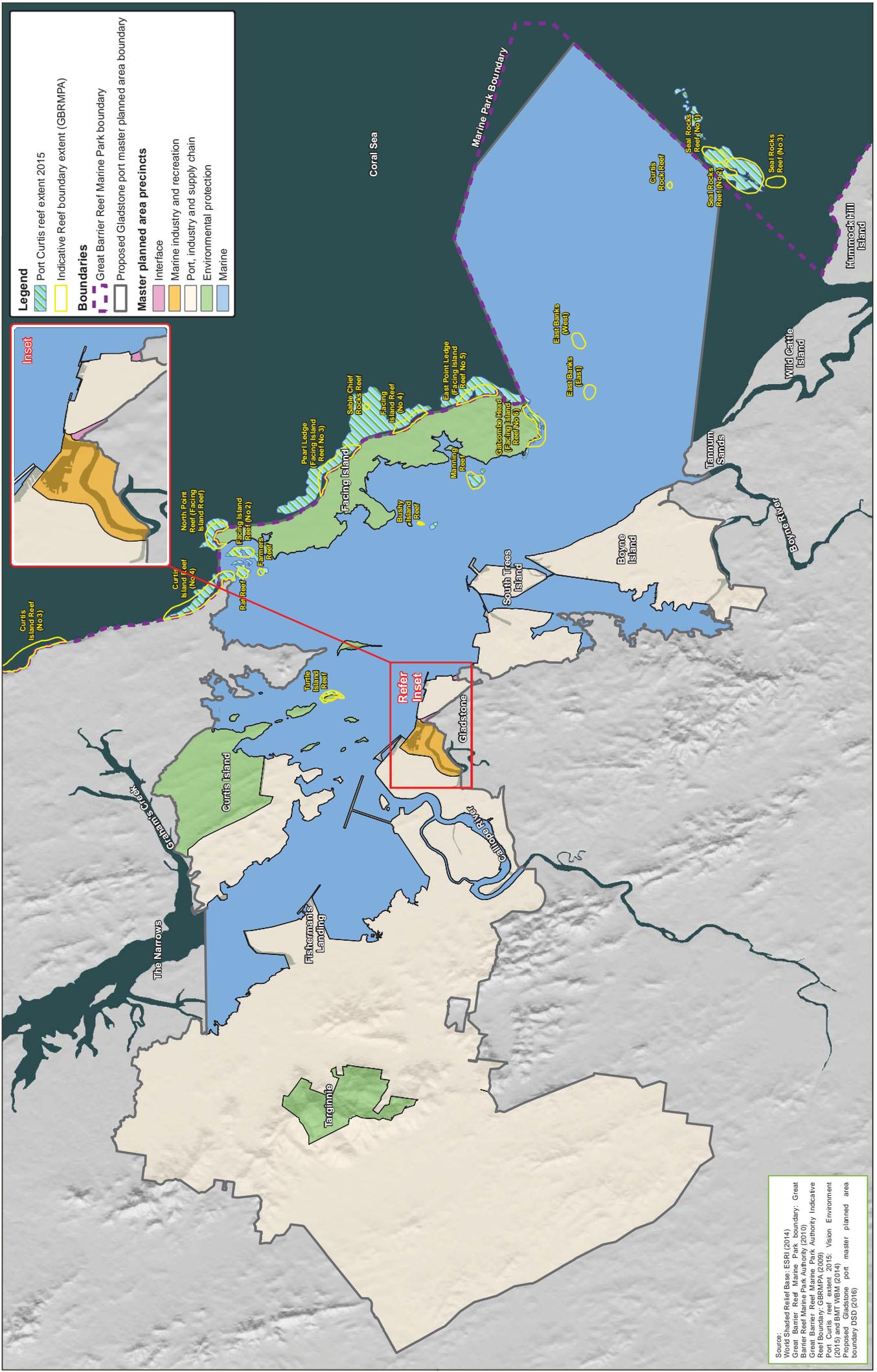
Sources:
 Shaded Relief Base: ESR (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Regional Ecosystems: Vegetation management regional ecosystem and remnant map - version 8.0: Department of Natural Resources and Mines (Mar 2015)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Gladstone port master planning risk assessment
Figure A.5: Regional Ecosystems containing mangroves



Gladstone port master planning risk assessment
Figure A.6: Extent of seagrass meadows



- Legend**
- Port Curtis reef extent 2015
 - Indicative Reef boundary extent (GBRMIPA)
- Boundaries**
- Great Barrier Reef Marine Park boundary
 - Proposed Gladstone port master planned area boundary
- Master planned area precincts**
- Interface
 - Marine industry and recreation
 - Port, industry and supply chain
 - Environmental protection
 - Marine

Map by: RB
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Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

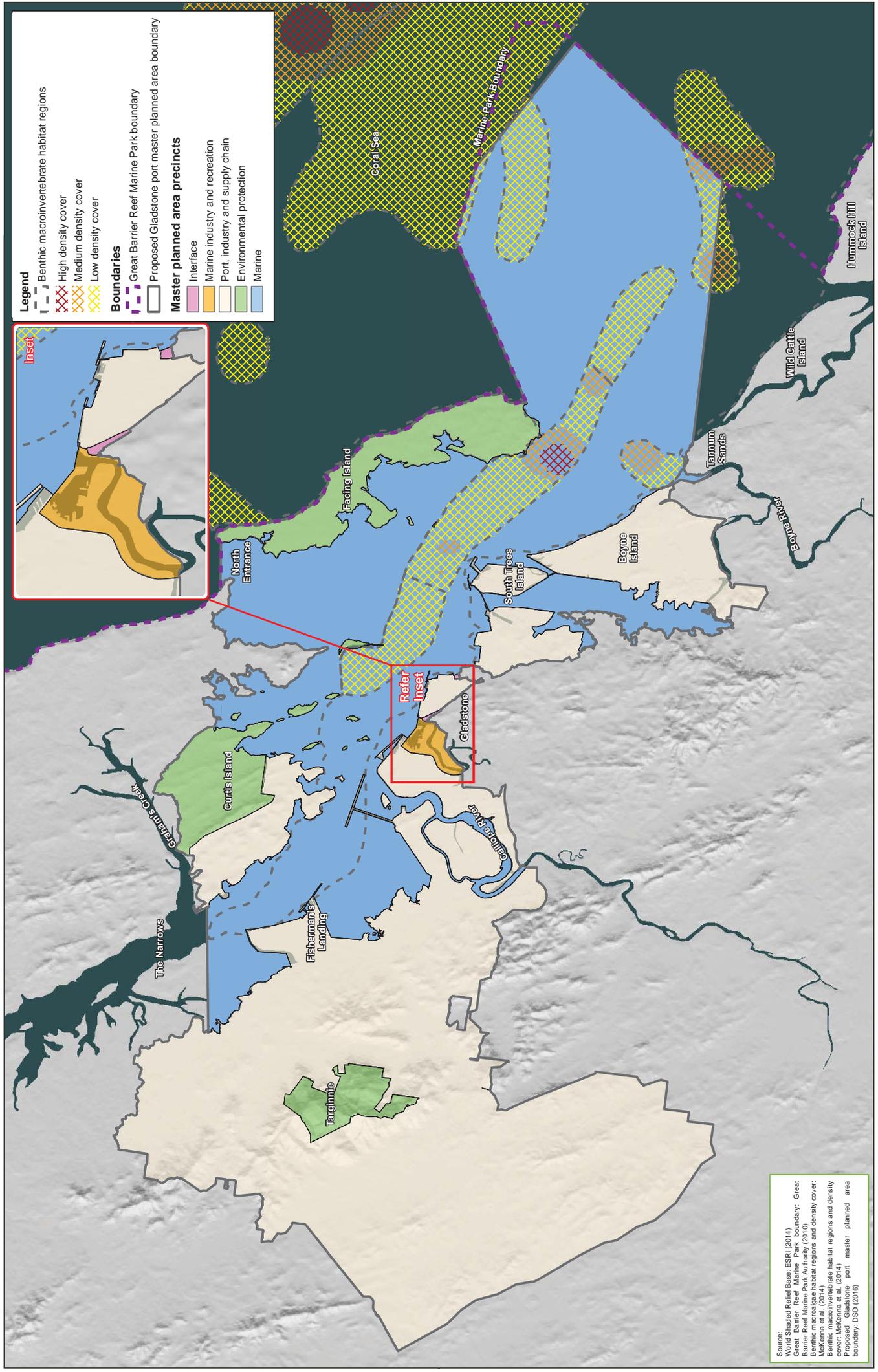
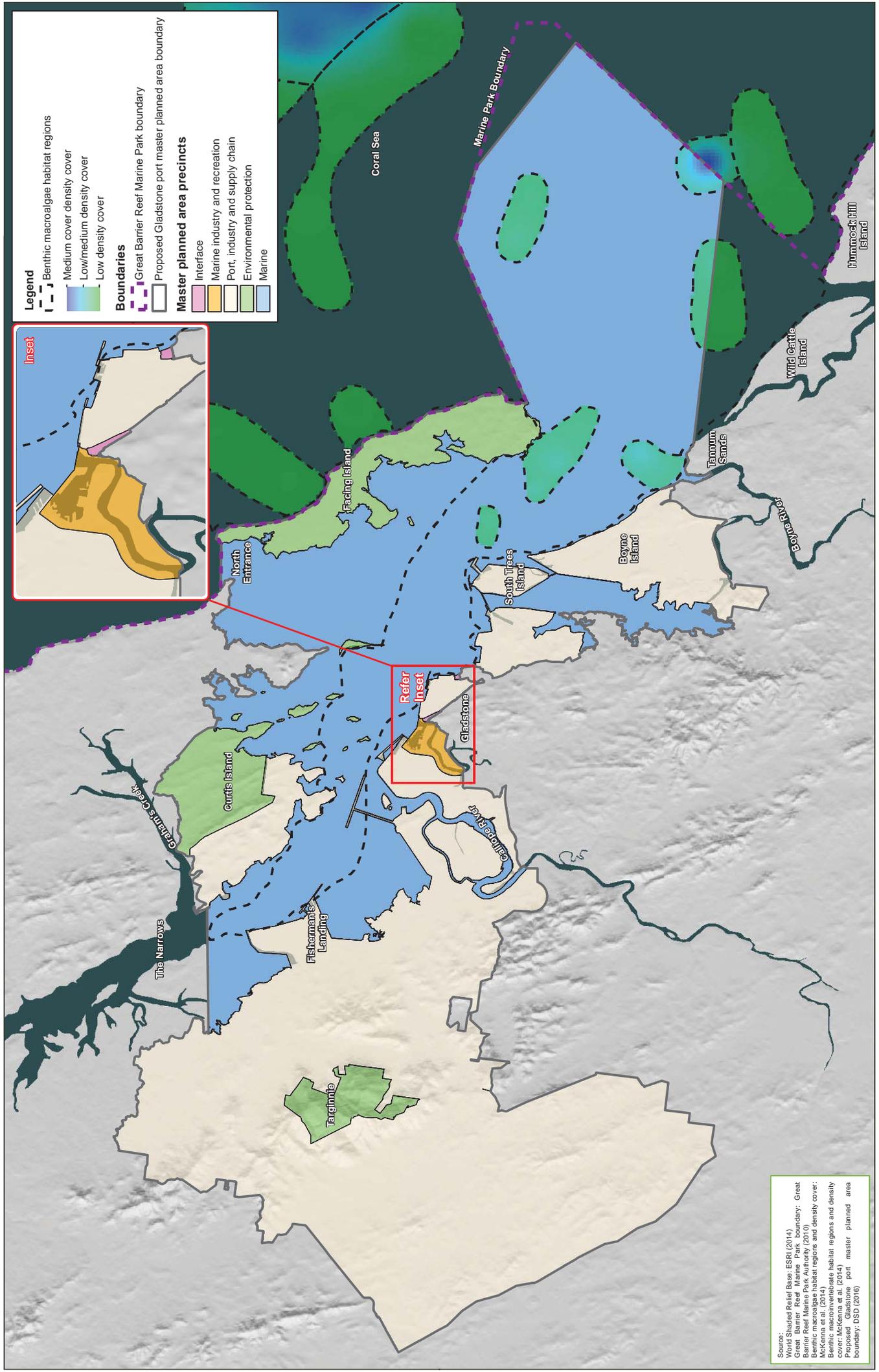


Figure A.8: Benthic macroalgae and macroinvertebrate distribution and density

Source:
 United States Geological Survey (2014)
 Great Barrier Reef Marine Park Authority (2010)
 Benthic macroalgae habitat regions and density cover:
 McKenna et al. (2014)
 Benthic macroinvertebrate habitat regions and density cover:
 Proposed Gladstone port master planned area boundary, DSD (2016)



Legend

- Benthic macroalgae habitat regions
- Medium cover density cover
- Low/medium density cover
- Low density cover

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

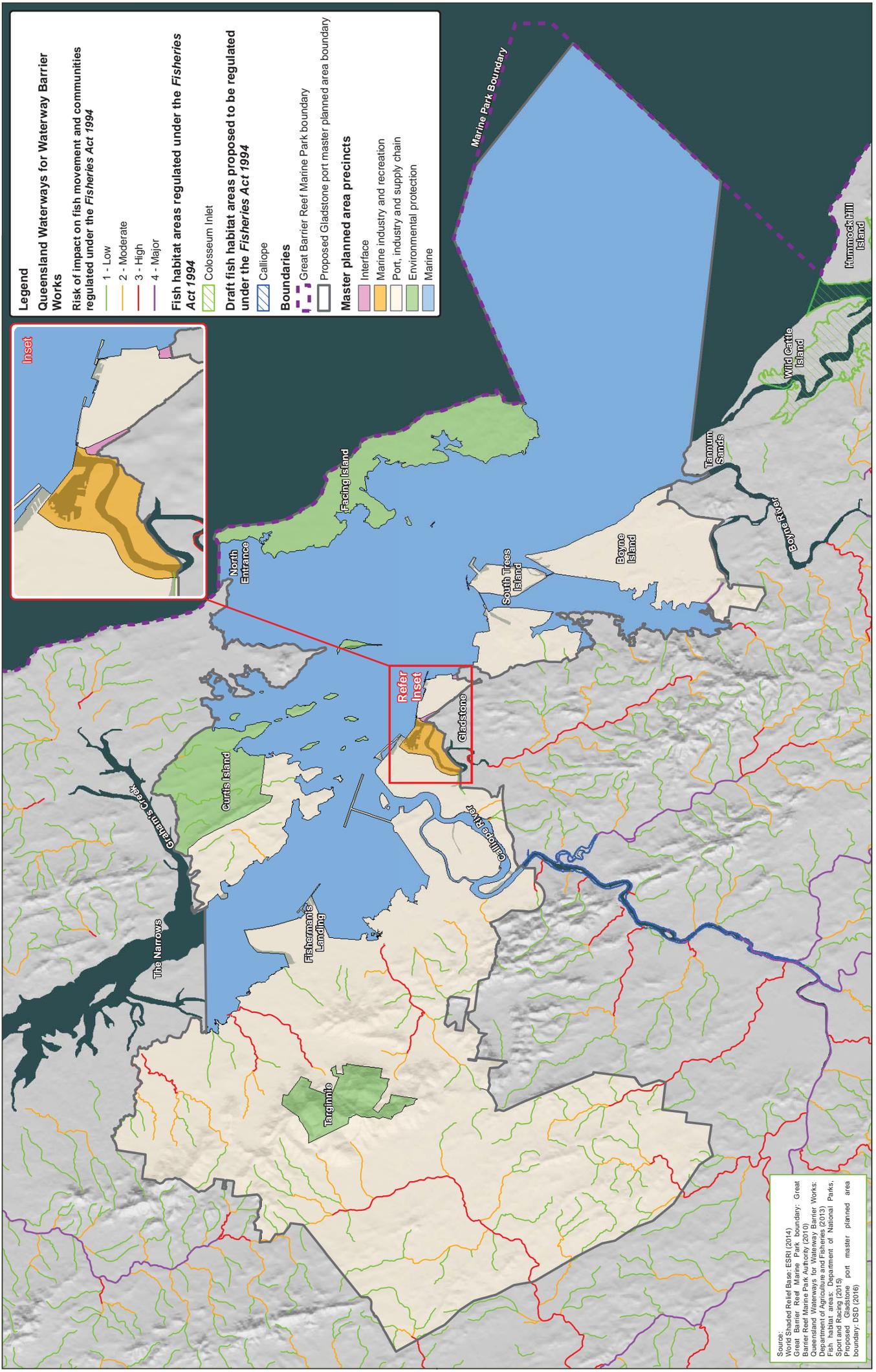
Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Source:
 World Heritage List (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Benthic macroalgae habitat regions and density cover: McKenna et al. (2014)
 Benthic macroinvertebrate habitat regions and density cover: McKenna et al. (2014)
 Proposed Gladstone port master planned area boundary: DSD (2016)



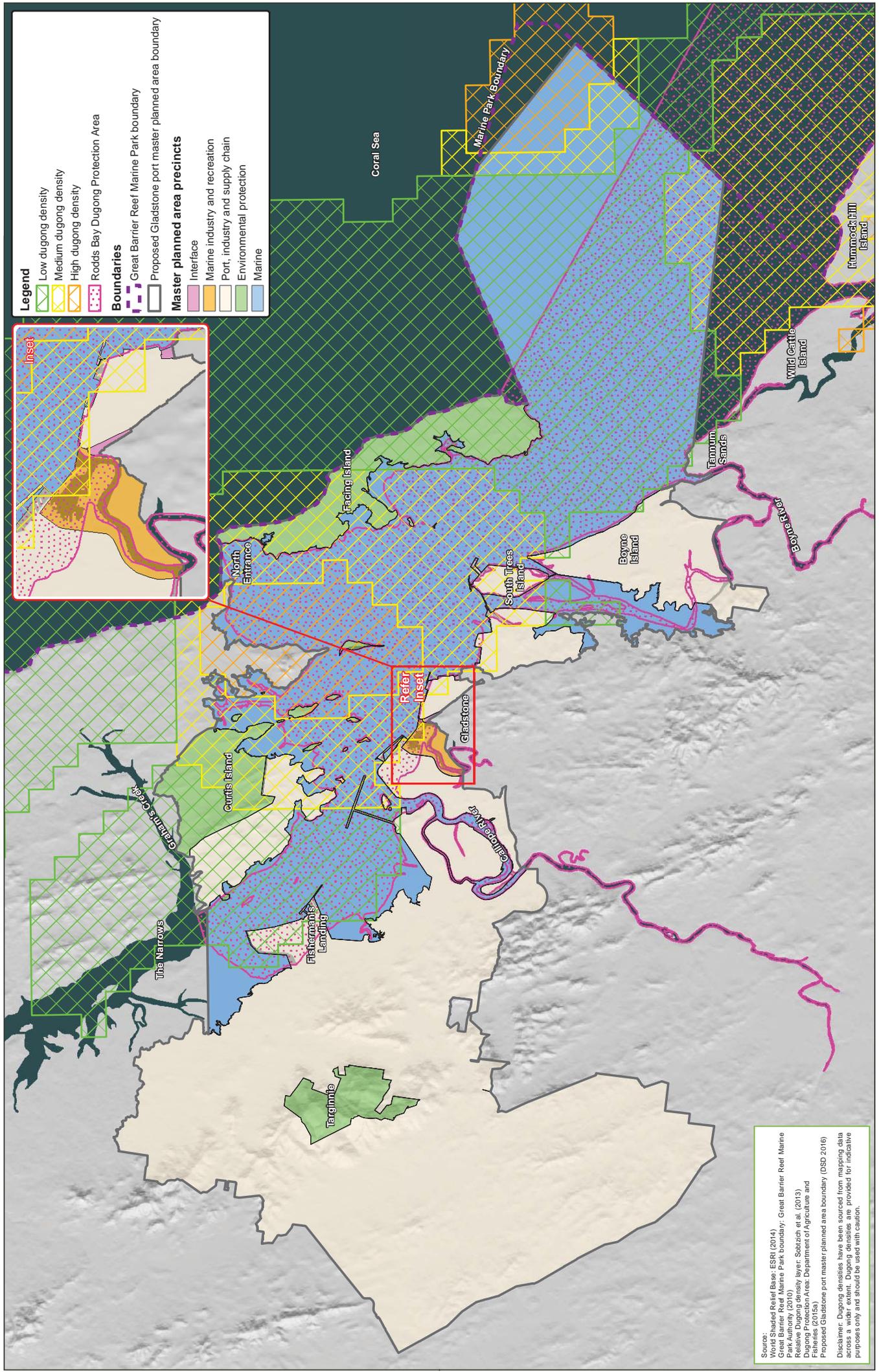
Figure A.8: Benthic macroalgae and macroinvertebrate distribution and density
 Gladstone port master planning risk assessment
 Page 2 of 2



Source: World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority
 Queensland Waterways for Waterway Barrier Works: Department of Agriculture and Fisheries (2013)
 Fish habitat areas: Department of National Parks, Sport and Racing (2015)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Figure A.9: Fish Habitat Areas and potential fish movement passages regulated under the Fisheries Act 1994



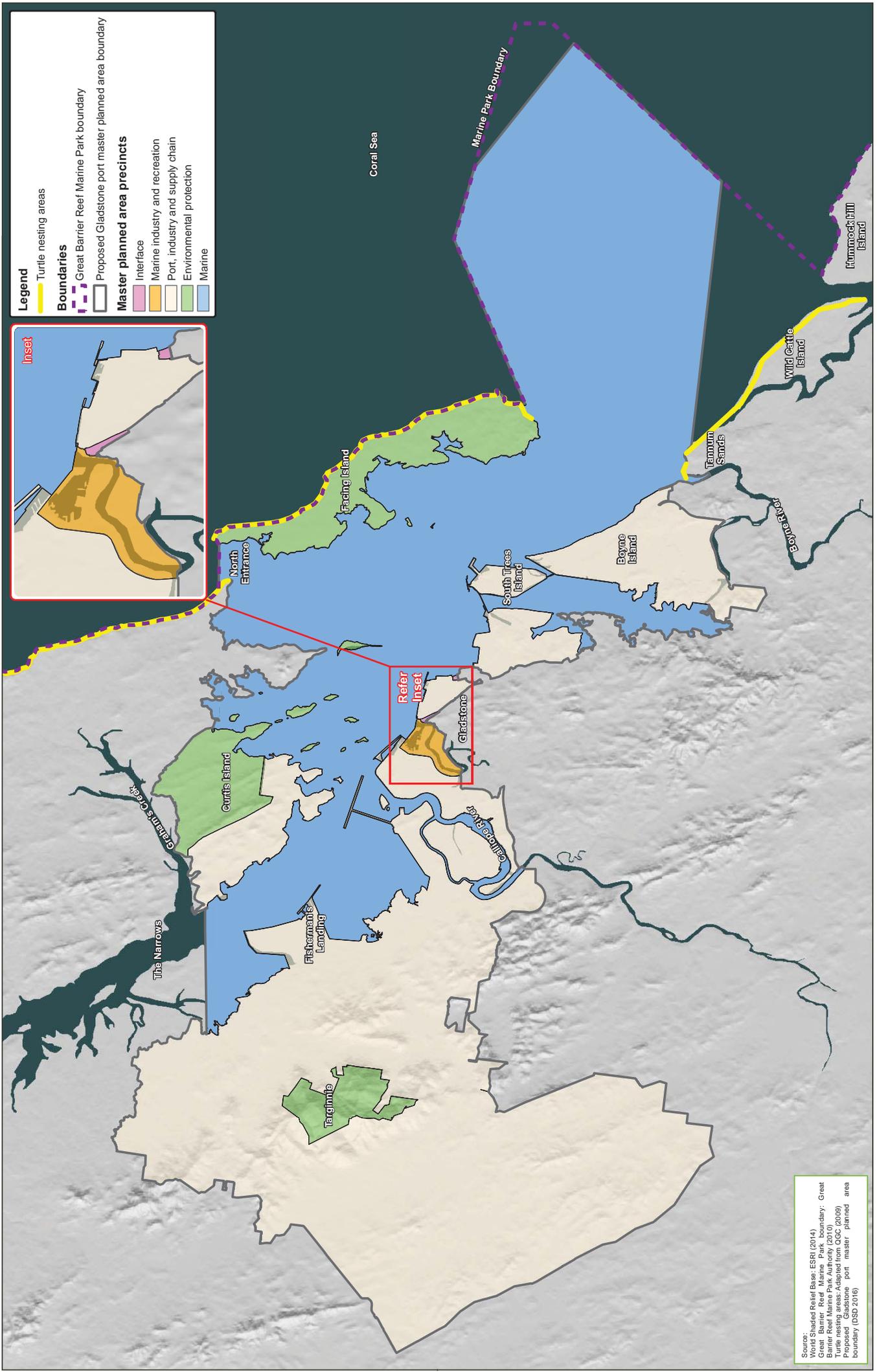
Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Dugong density layer: Szatich et al. (2013)
 Dugong Protection Area: Department of Agriculture and Fisheries (2015a)
 Proposed Gladstone port master planned area boundary (DSD 2016)

Disclaimer: Dugong densities have been sourced from mapping data across a wide extent. Dugong densities are provided for indicative purposes only and should be used with caution.

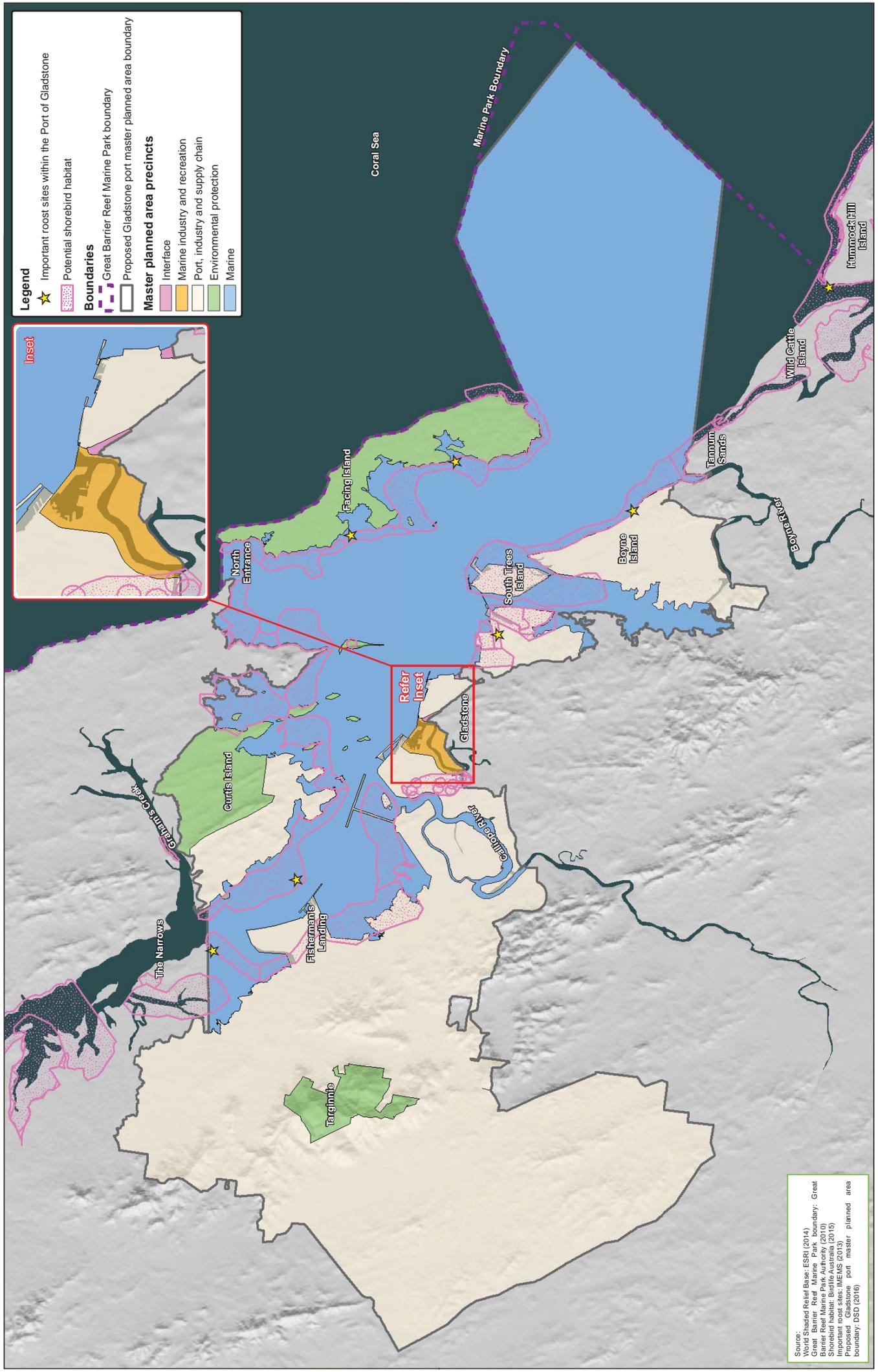


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 Coordinate system: GDA 1994 MGA Zone 56

Figure A.10: Relative dugong density based on aerial surveys conducted from 1986 to 2005
 Gladstone port master planning risk assessment



Gladstone port master planning risk assessment
 Figure A.11: Marine turtle nesting areas



Legend

- ★ Important roost sites within the Port of Gladstone
- ▨ Potential shorebird habitat

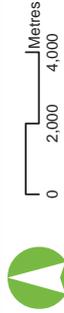
Boundaries

- ▬ Great Barrier Reef Marine Park boundary
- ▬ Proposed Gladstone port master planned area boundary

Master planned area precincts

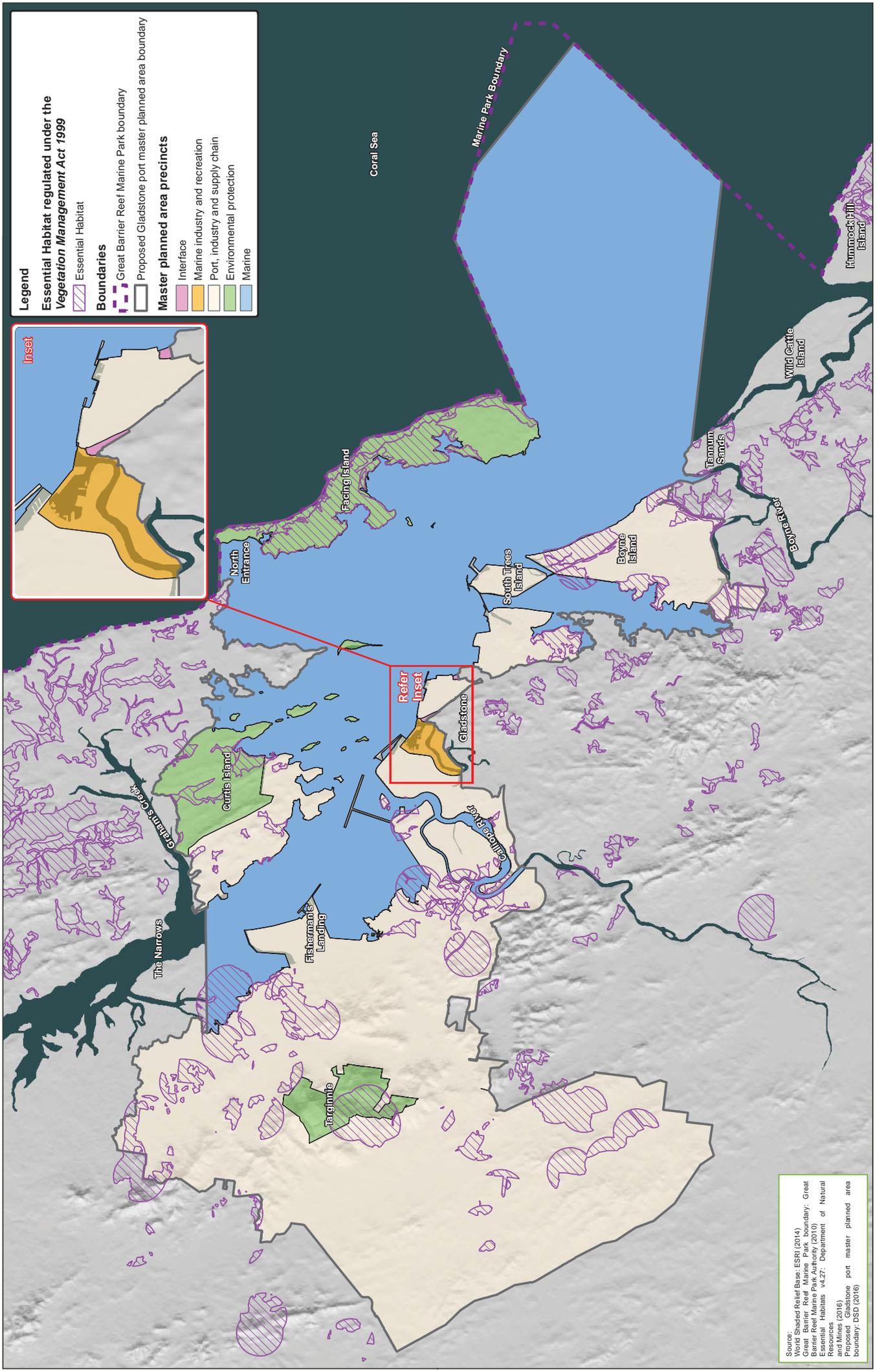
- ▬ Interface
- ▬ Marine industry and recreation
- ▬ Port, industry and supply chain
- ▬ Environmental protection
- ▬ Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Shorebird habitat: BirdLife Australia (2015)
 Important roost sites: IIRMS (2013)
 Port of Gladstone port master planned area boundary: DSD (2016)



Gladstone port master planning risk assessment

Figure A.12: Potential shorebird habitat and important roost sites identified through shorebird monitoring surveys



Legend

Essential Habitat regulated under the Vegetation Management Act 1999

- Essential Habitat

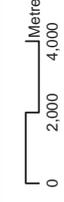
Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Source:
 Unpublished Report: ESS1 (2014)
 Great Barrier Reef Marine Park Authority
 Great Barrier Reef Marine Park Authority (2010)
 Essential Habitats v4.27: Department of Natural Resources and Mines (2016)
 Gladstone port master planned area boundary, DSD (2016)



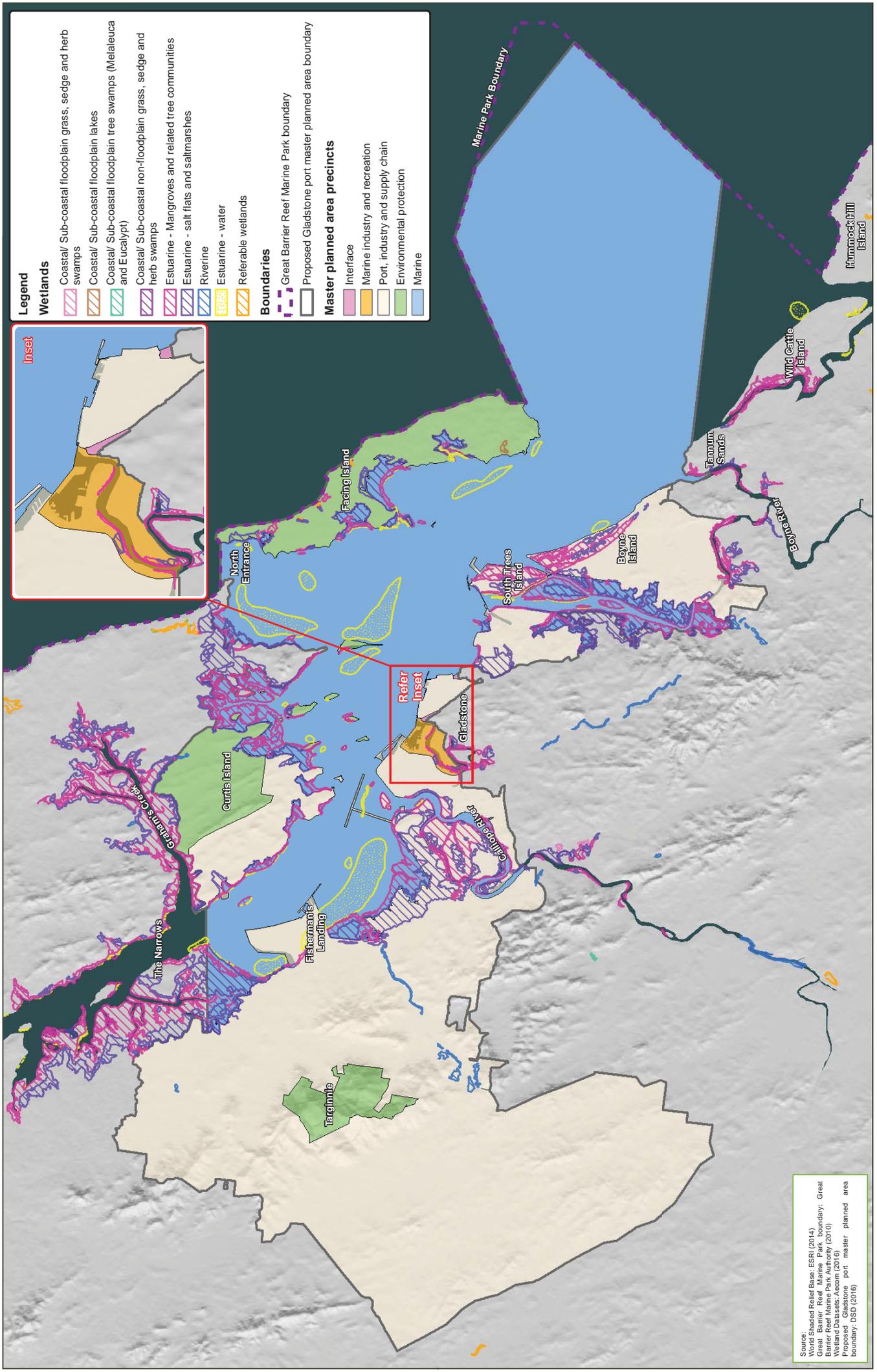
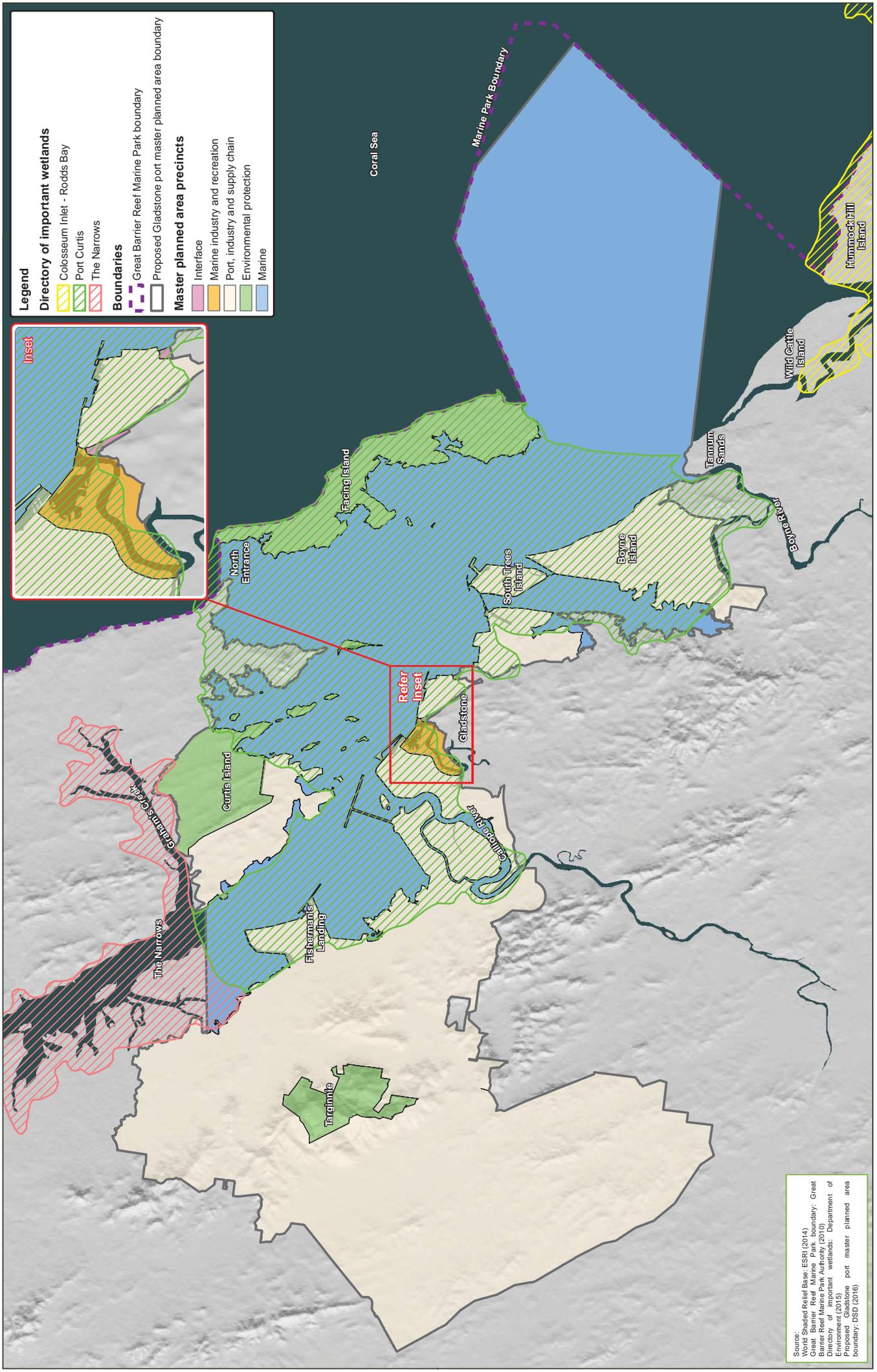


Figure A.15: Wetlands as mapped in the Evidence Base Report



Legend

Directory of important wetlands

- Colosseum Inlet - Rodds Bay
- Port Curtis
- The Narrows

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

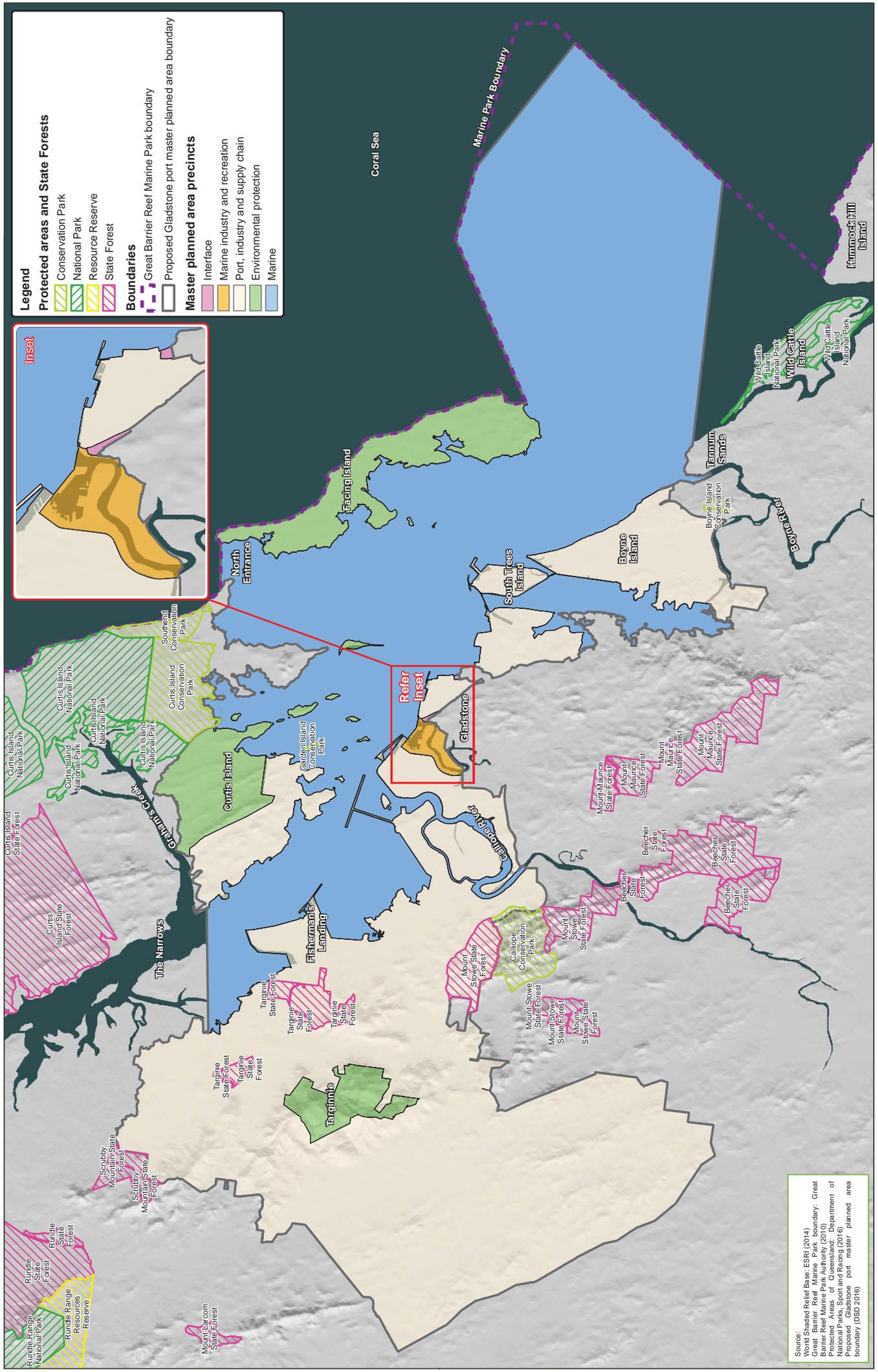
- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Directory of important wetlands: Department of Environment and Heritage (2010)
 Proposed Gladstone port master planned area boundary: DSD (2016)



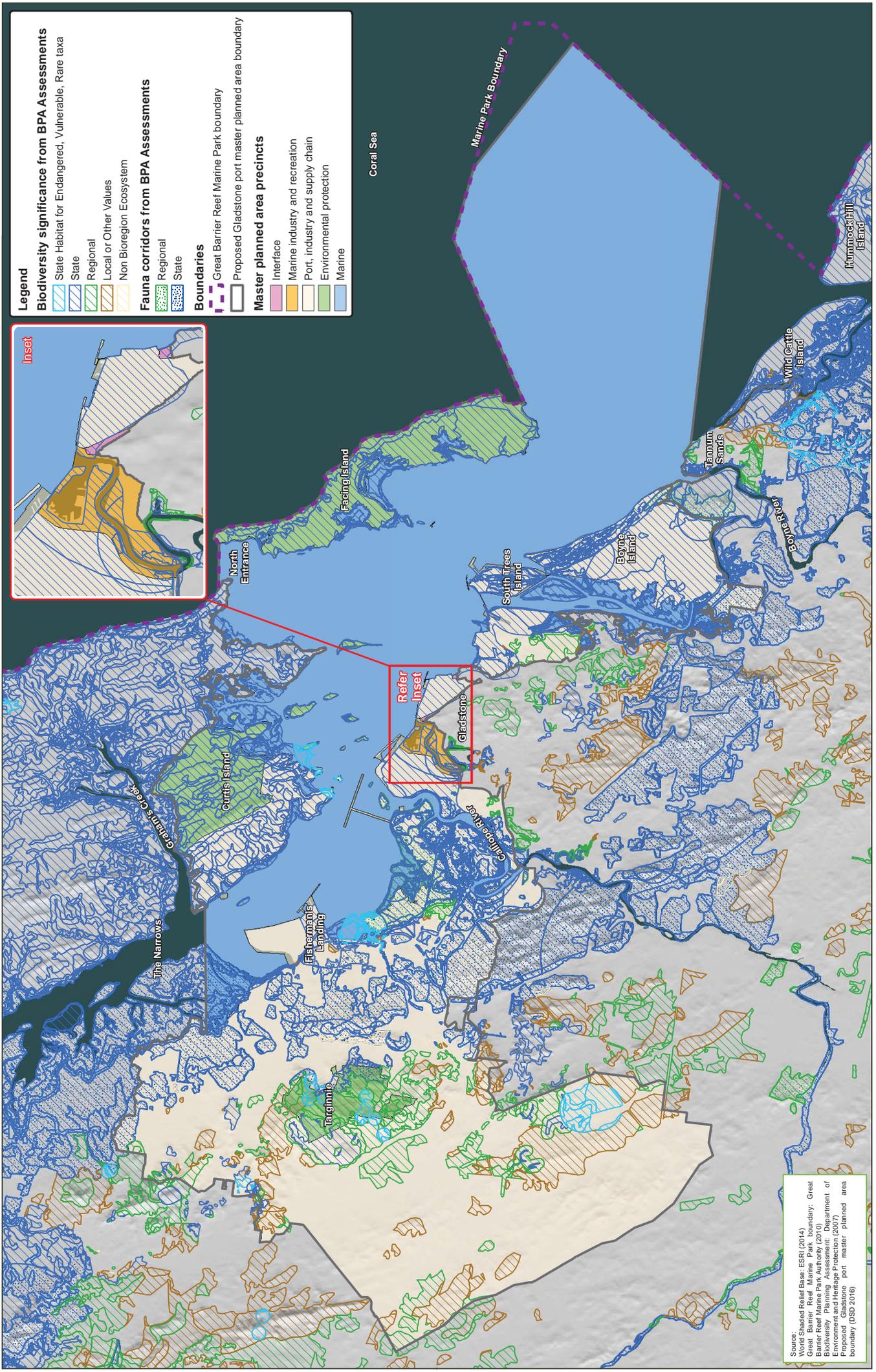
Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
 Figure A.16: Directory of important wetlands



Gladstone port master planning risk assessment

Figure A.17: Protected areas regulated under the Nature Conservation Act 1992 and State Forests regulated under the Forestry Act 1959



Legend

Biodiversity significance from BPA Assessments

- State Habitat for Endangered, Vulnerable, Rare taxa
- State
- Regional
- Local or Other Values
- Non Bioregion Ecosystem

Fauna corridors from BPA Assessments

- Regional
- State

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

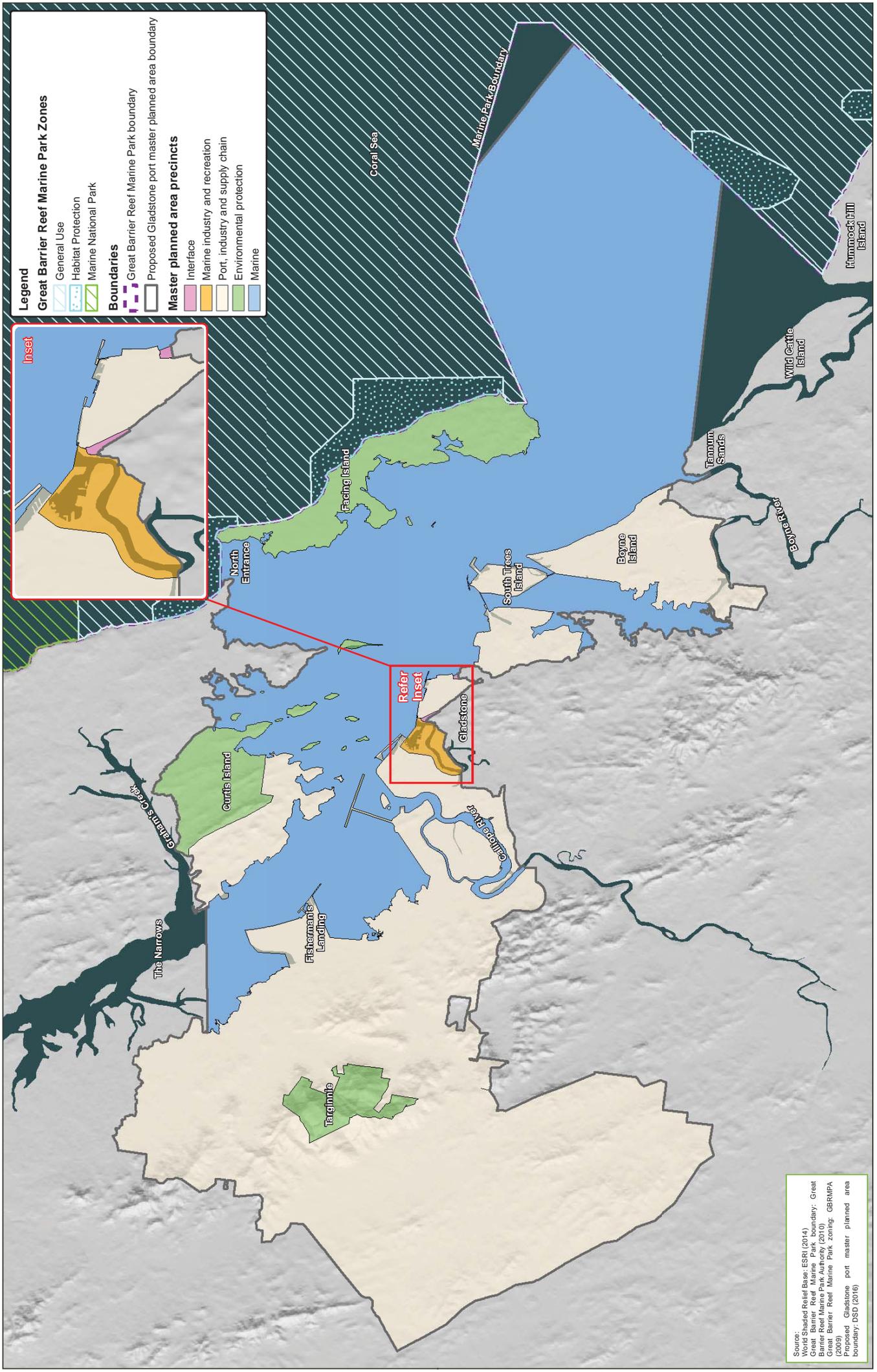
Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Source: World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Biodiversity significance assessment: Department of Environment and Heritage Protection (2007)
 Proposed Gladstone port master planned area boundary (DSD 2016)



Figure A.18: Biodiversity Planning Assessment areas mapped using the Biodiversity Assessment and Mapping Methodology



Legend

Great Barrier Reef Marine Park Zones

- General Use
- Habitat Protection
- Marine National Park

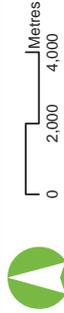
Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

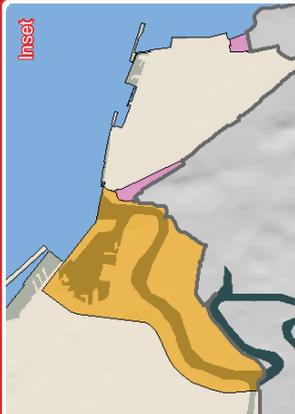
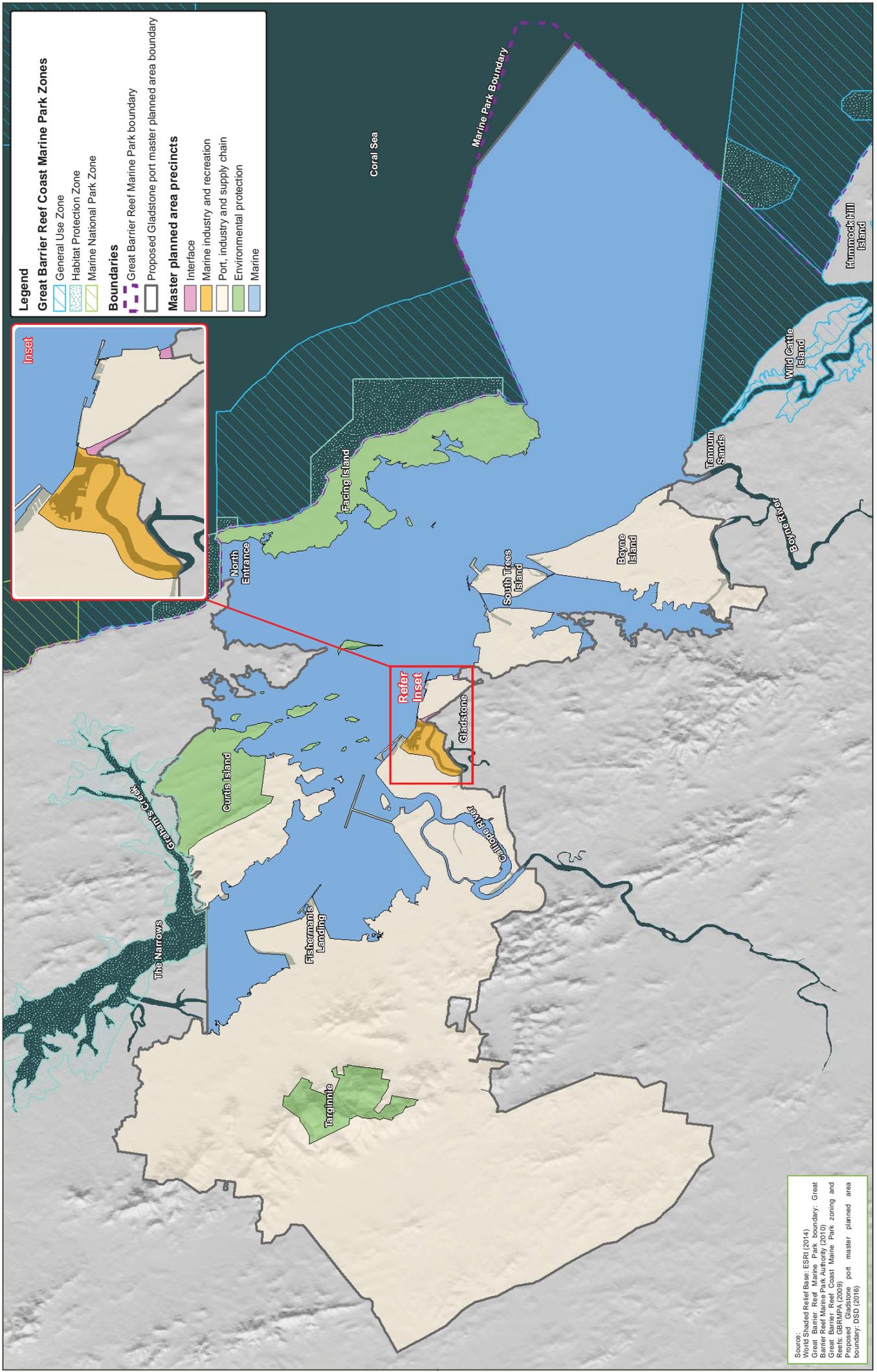
- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Great Barrier Reef Marine Park zoning: GBRMPA (2010)
 Proposed Gladstone port master planned area boundary: DSD (2016)

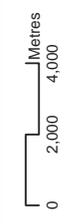


Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

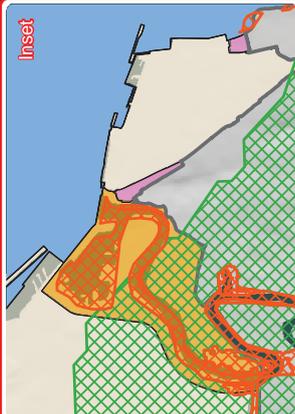
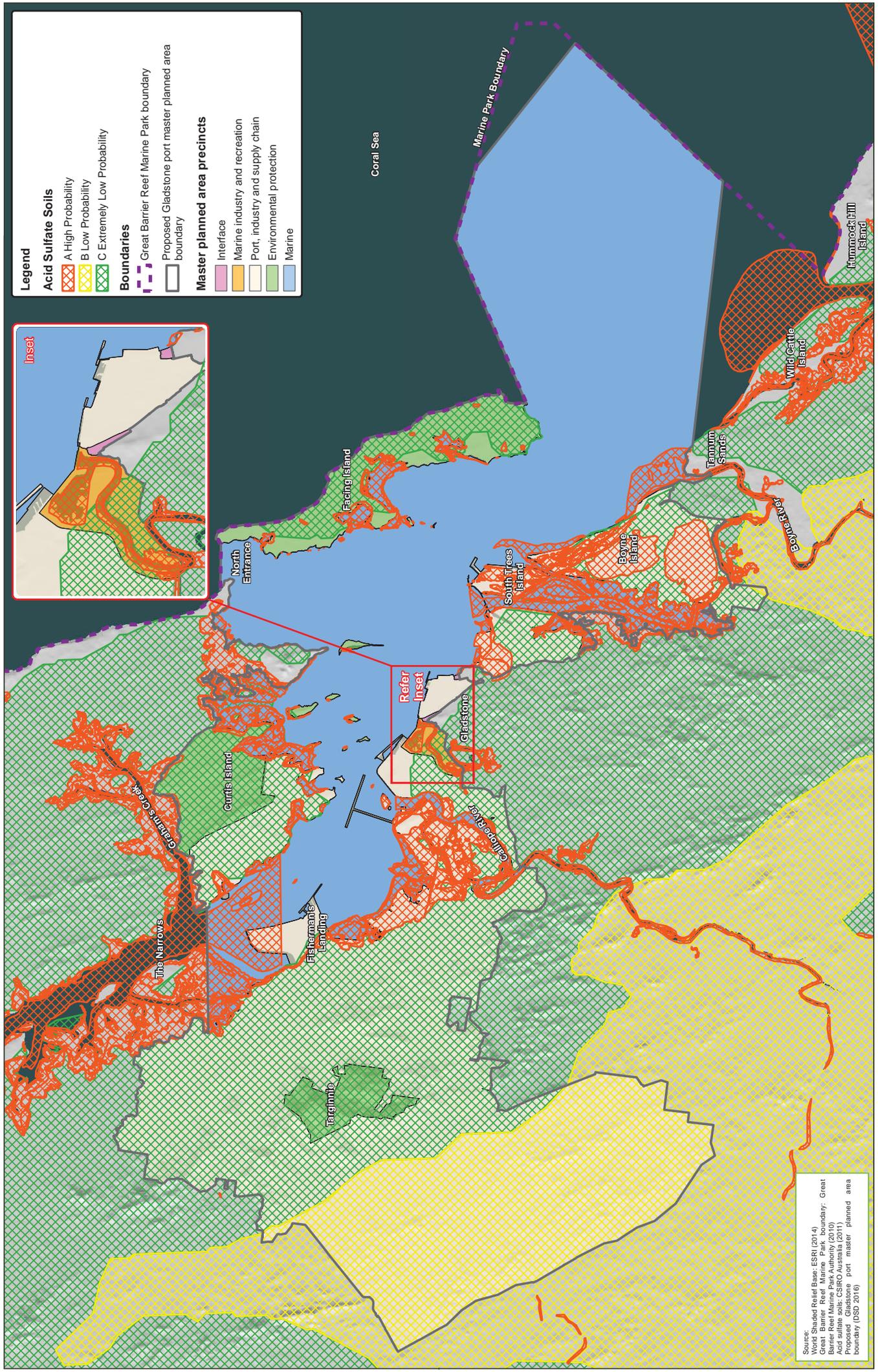
Gladstone port master planning risk assessment
Figure A.19: Great Barrier Reef Marine Park Zones (Commonwealth)



Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Great Barrier Reef Coast Marine Park zoning and Reefs: GBRP/PA (2009)
 Gladstone port master planned area boundary: DSD (2016)



Gladstone port master planning risk assessment
 Figure A.20: Great Barrier Reef Coast Marine Park Zones (State)



Legend

Acid Sulfate Soils

- A High Probability
- B Low Probability
- C Extremely Low Probability

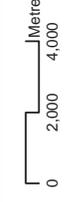
Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Acid sulfate soils: CSIRO Australia (2010)
 Port master planned area boundary: DSD (2016)



Gladstone port master planning risk assessment
 Figure A.21: Acid sulfate soils

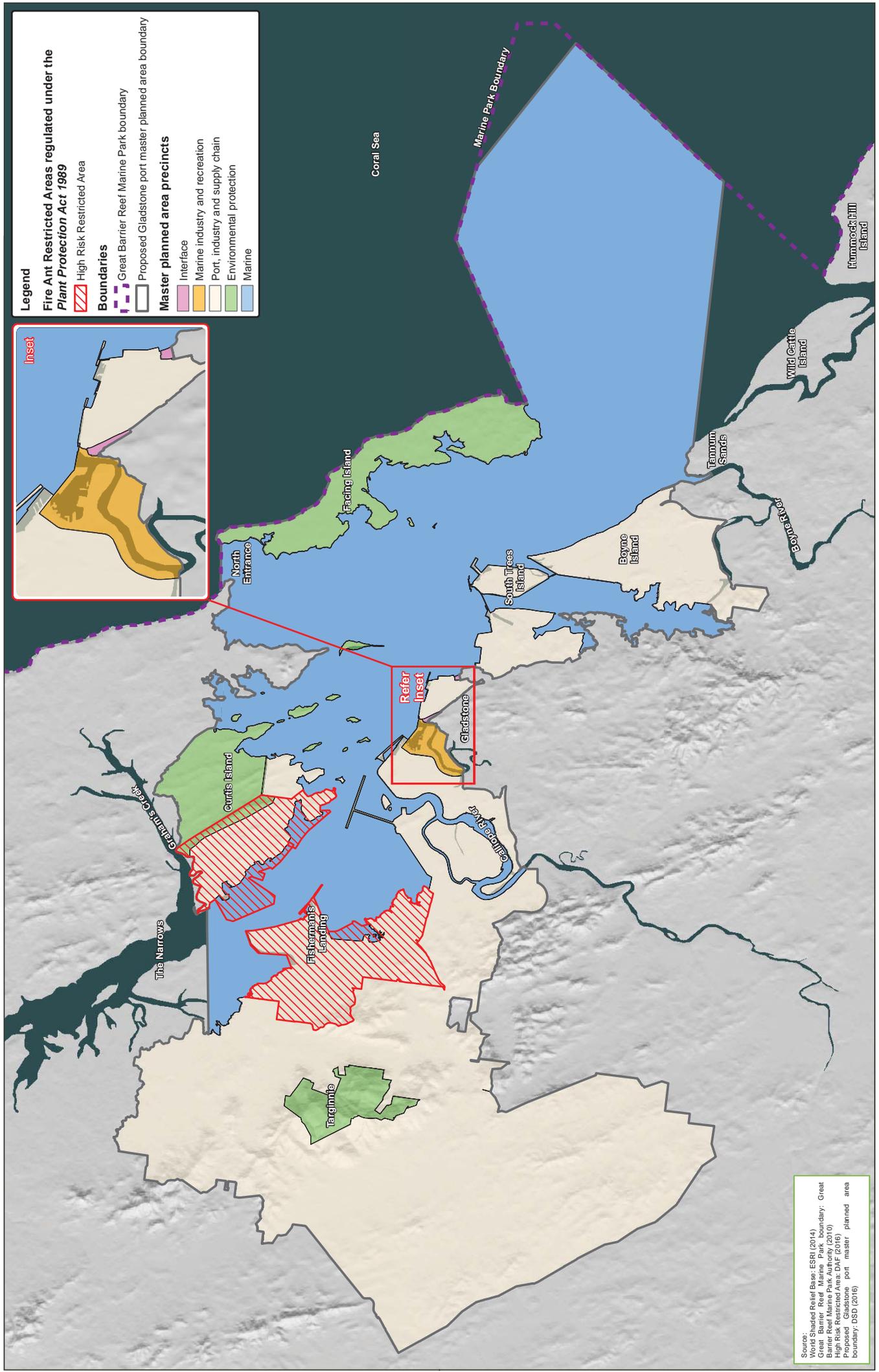


Figure A.22: Gladstone Fire Ant Restricted Areas regulated under the Plant Protection Act 1989



Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 High Risk Restricted Area DAF (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

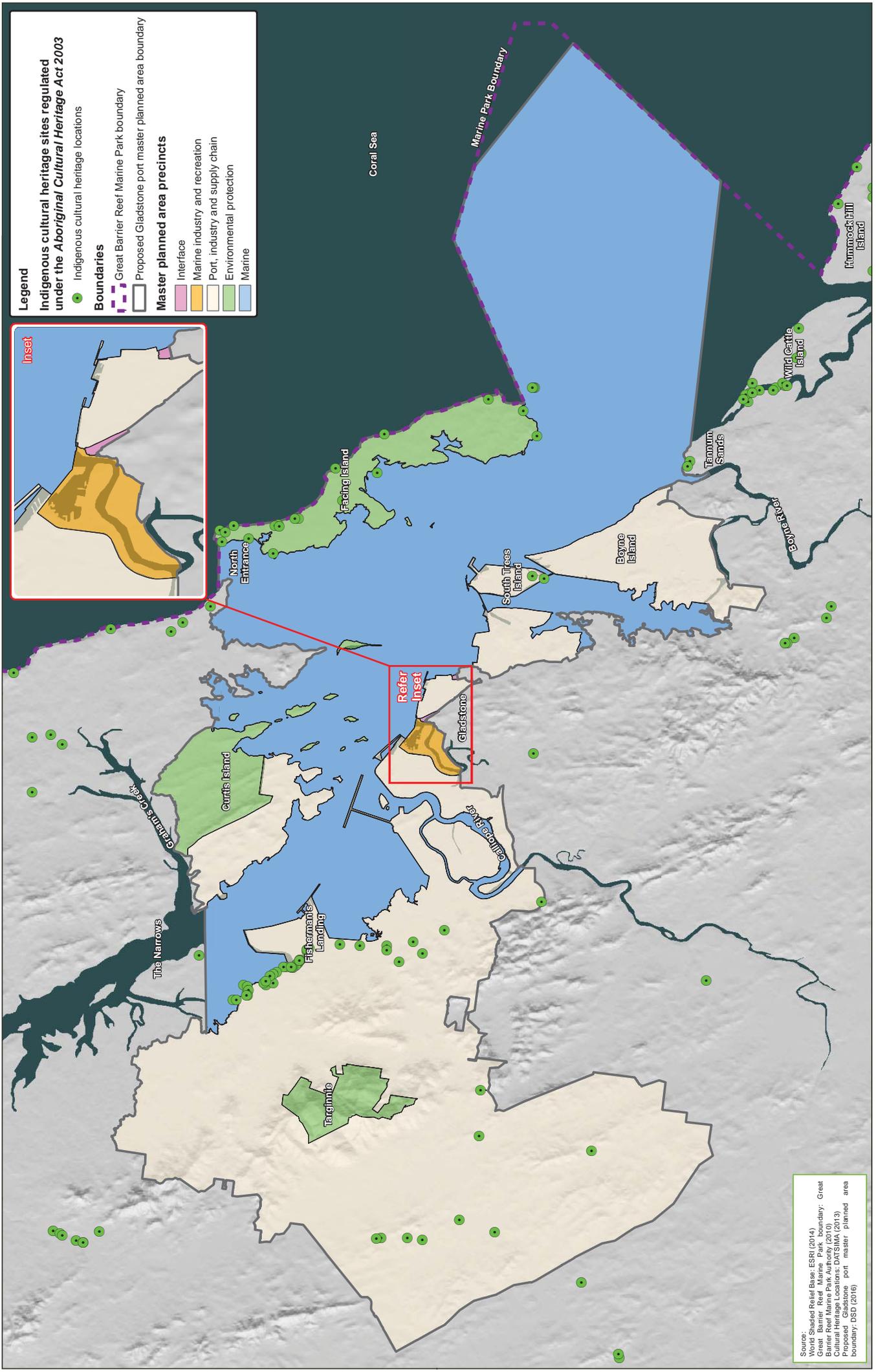


Figure A.23: Indigenous cultural heritage sites regulated under the Aboriginal Cultural Heritage Act 2003

Gladstone port master planning risk assessment

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 Coordinate system: GDA 1994 MGA Zone 56

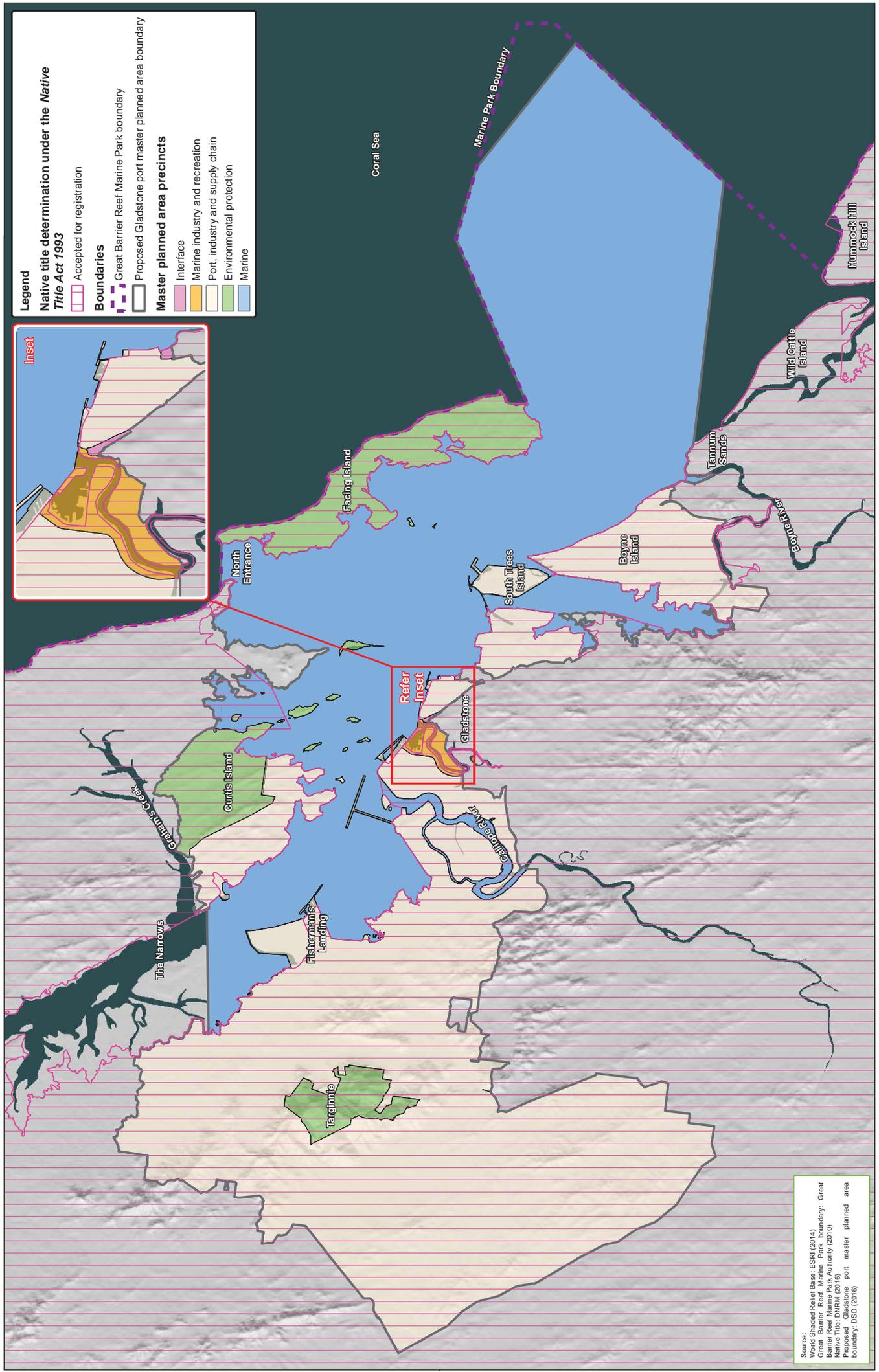


Figure A.24: Native title determination under the Native Title Act 1993

Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Native Title: DNRM (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

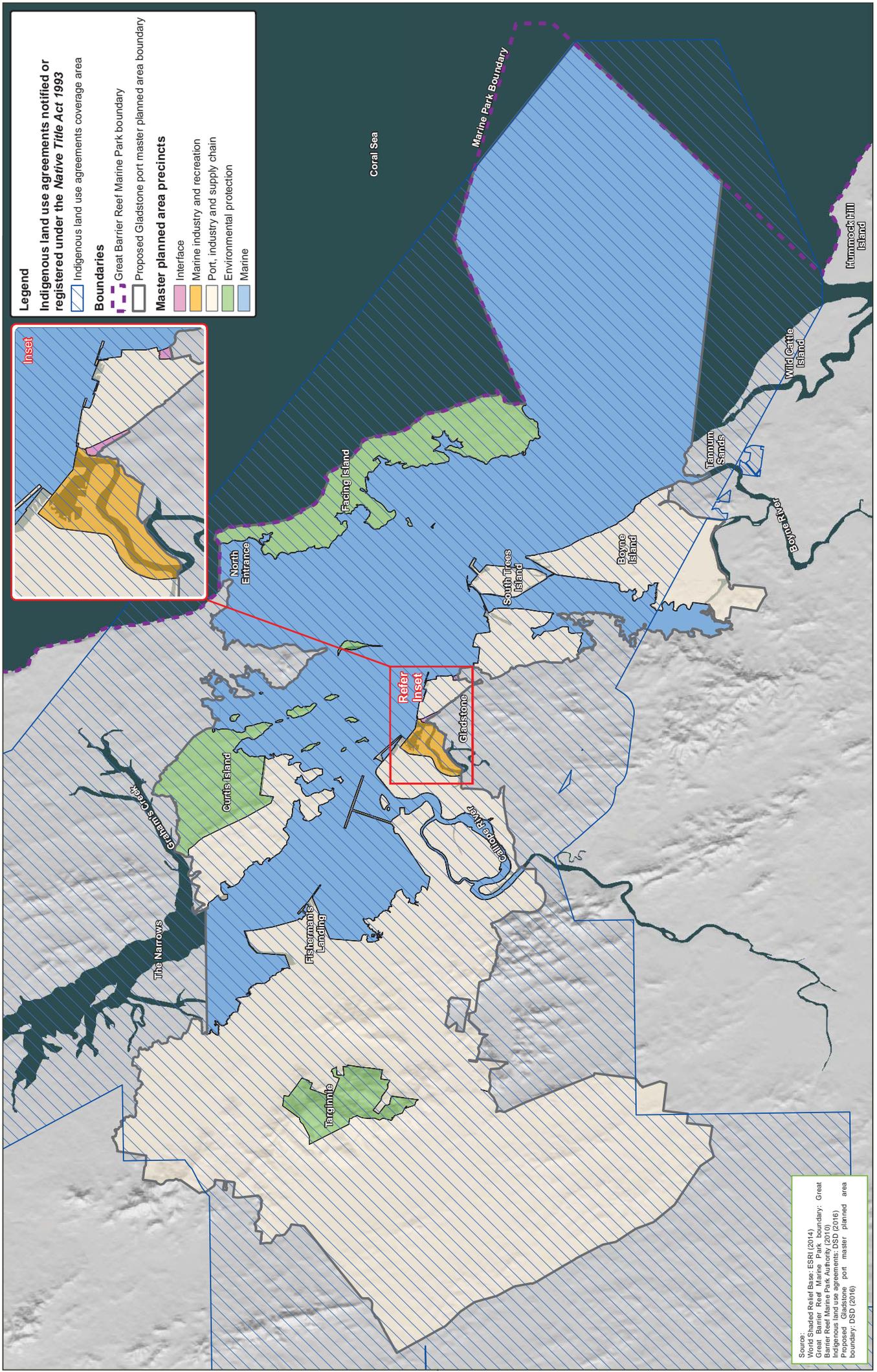
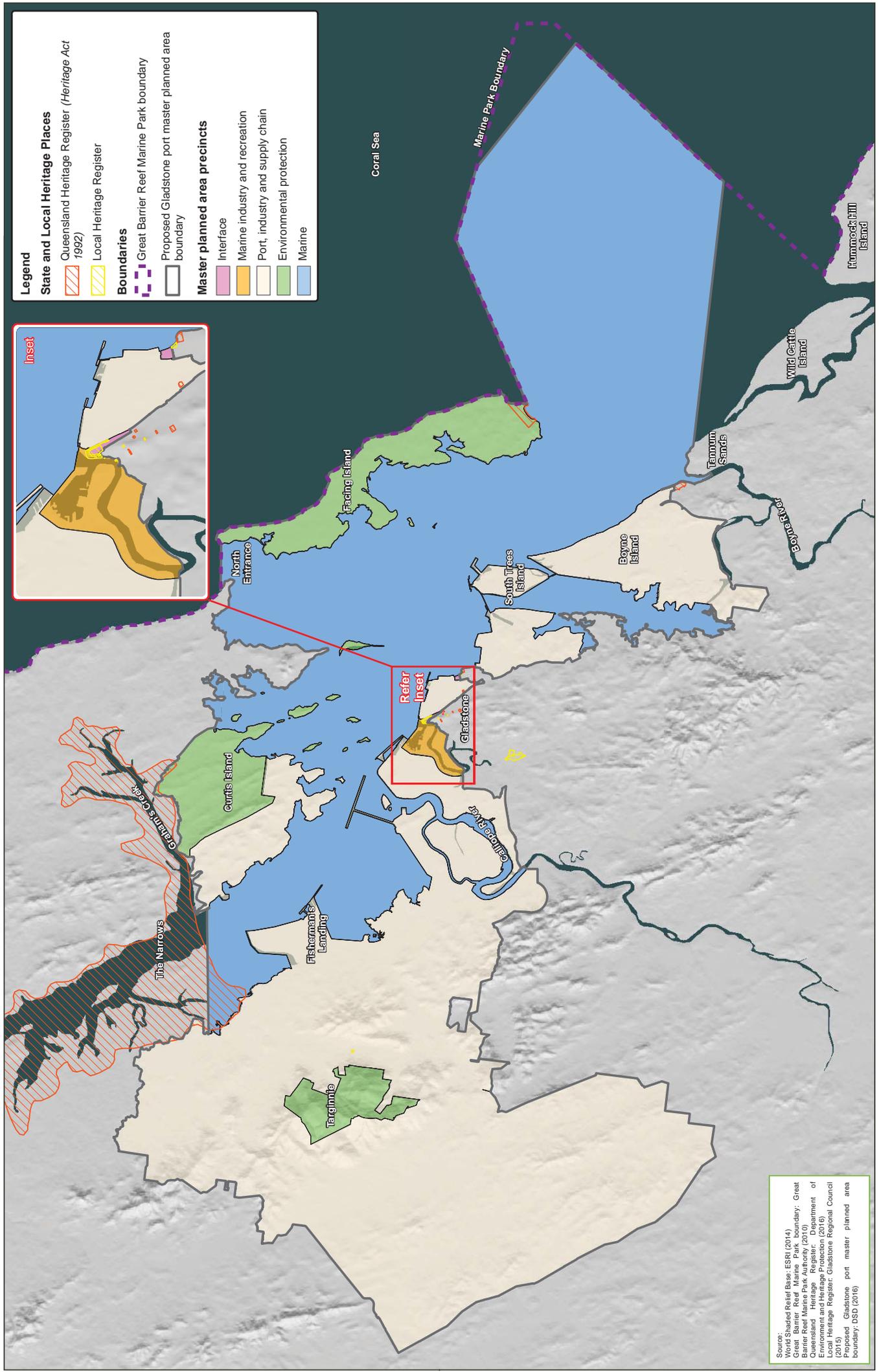


Figure A.25: Coverage of Indigenous land use agreements notified or registered under the Native Title Act 1993



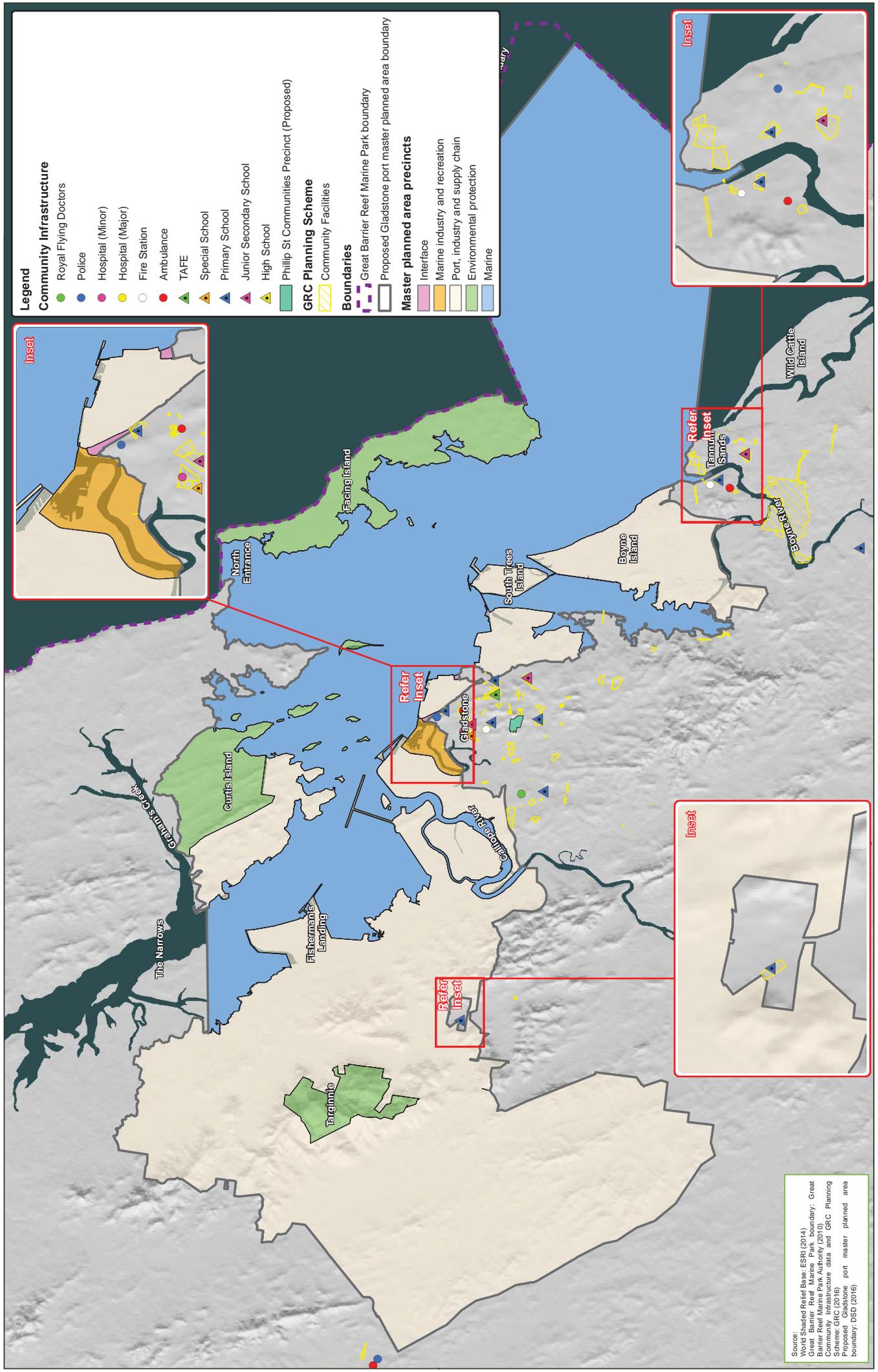
- Legend**
- State and Local Heritage Places**
- Queensland Heritage Register (Heritage Act 1992)
 - Local Heritage Register
- Boundaries**
- Great Barrier Reef Marine Park boundary
 - Proposed Gladstone port master planned area boundary
- Master planned area precincts**
- Interface
 - Marine industry and recreation
 - Port, industry and supply chain
 - Environmental protection
 - Marine

Sources:
 Shaded Relief Base: ESR (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Queensland Heritage Register: Department of Environment and Heritage Protection (2016)
 Local Heritage Register: Gladstone Regional Council (2015)
 Proposed Gladstone port master planned area boundary: DSD (2016)



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 Coordinate system: GDA 1994 MGA Zone 56

Figure A.27: State heritage places protected under the Heritage Act 1992 and local heritage places



Legend

Community Infrastructure

- Royal Flying Doctors
- Police
- Hospital (Minor)
- Hospital (Major)
- Fire Station
- Ambulance
- TAFE
- Special School
- Primary School
- Junior Secondary School
- High School
- Phillip St Communities Precinct (Proposed)

GRC Planning Scheme

- Community Facilities

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Community Facilities: ESRI (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

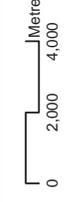


Figure A.28: Social and community infrastructure identified in the Gladstone Regional Council Planning Scheme

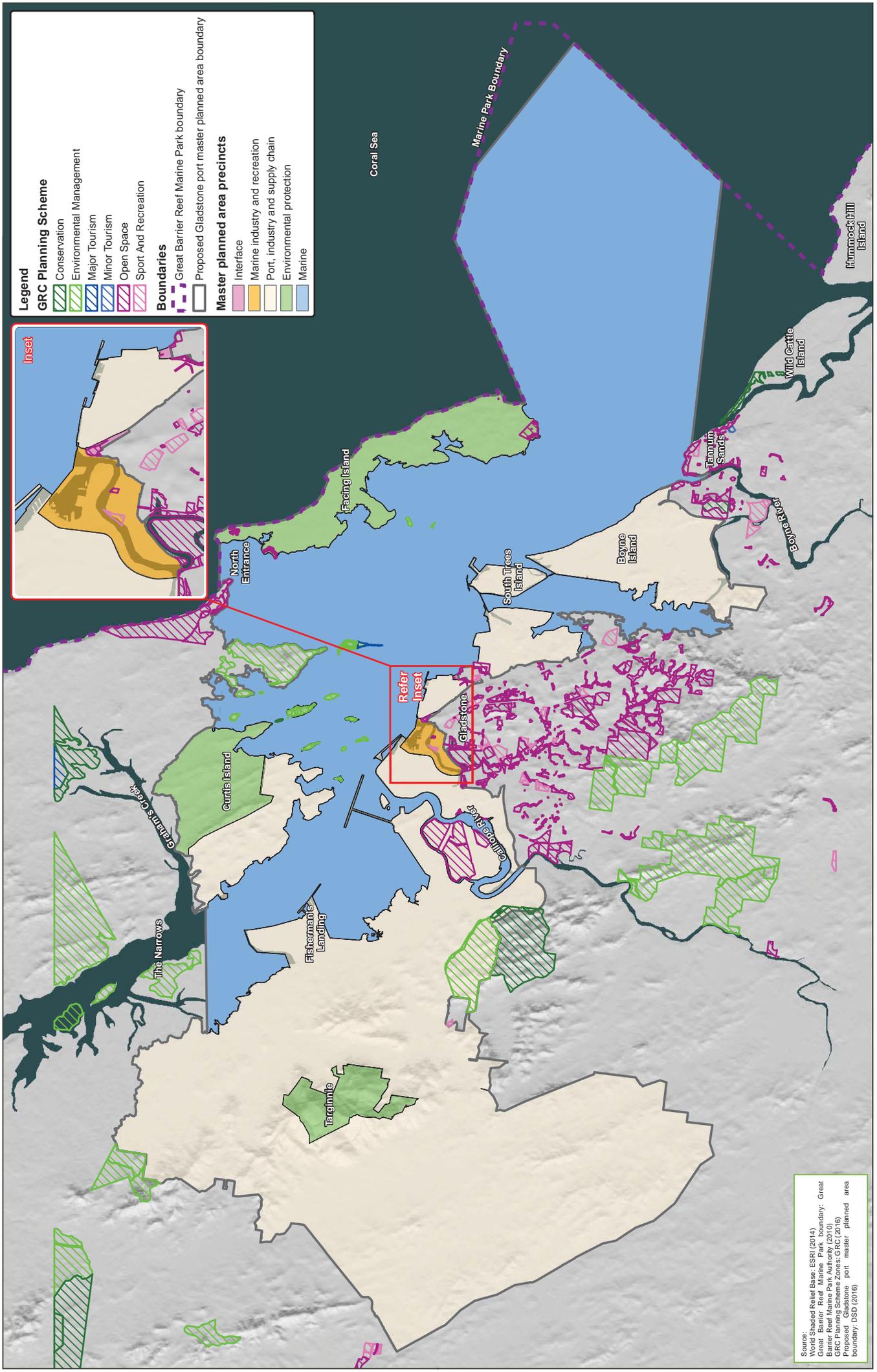
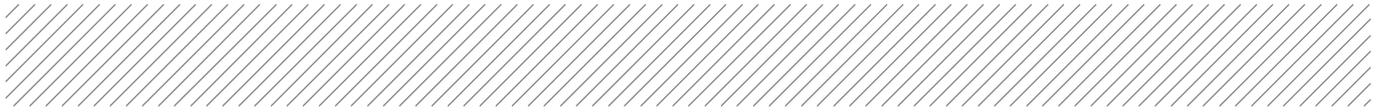


Figure A.29: Recreational opportunities and natural amenity as identified by the Gladstone Regional Council Plan Scheme

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 Coordinate system: GDA 1994 MGA Zone 56

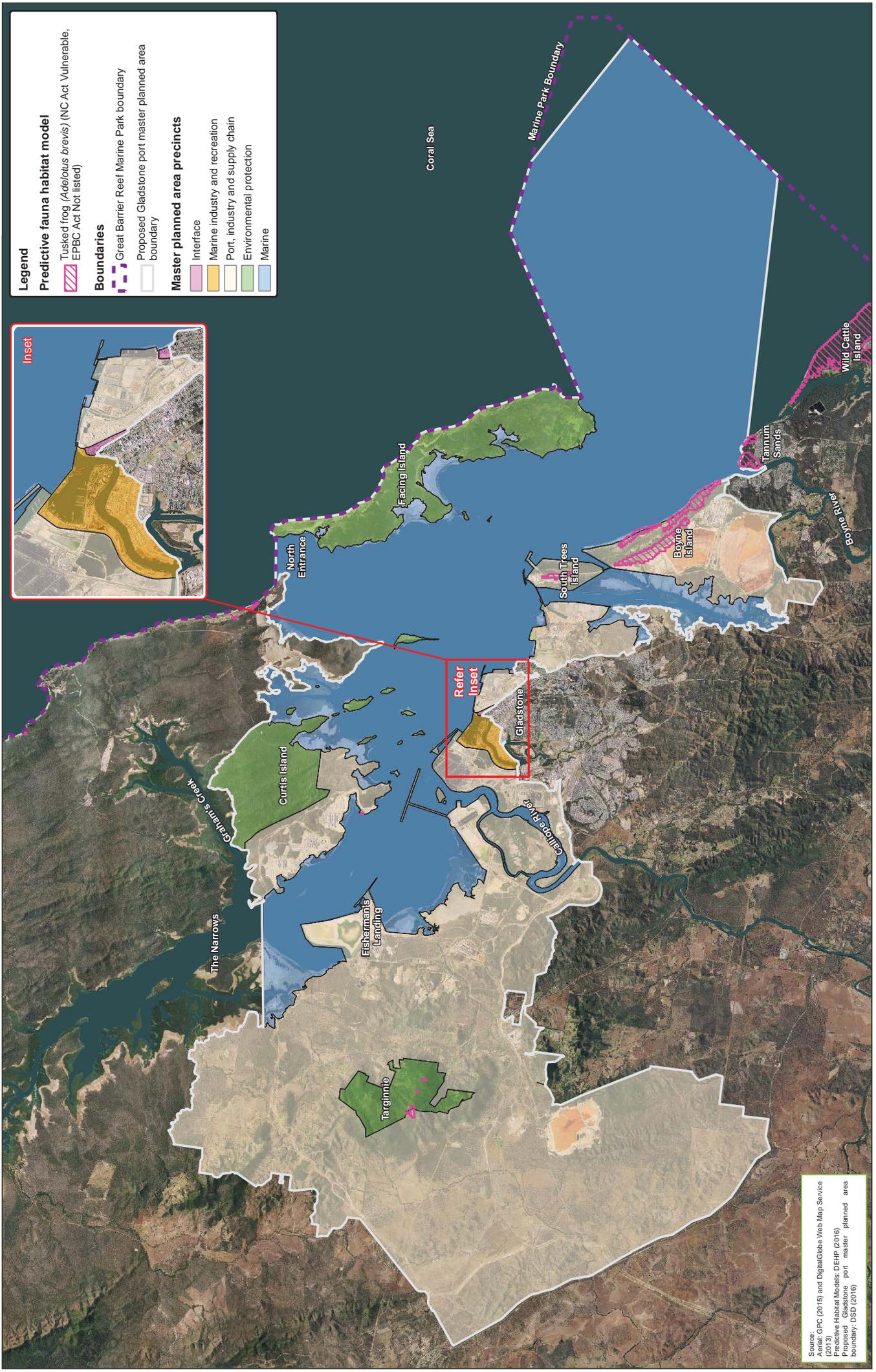
Map by: RB
 Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Proposed Gladstone port master planned area boundary: DSD (2016)





Appendix B

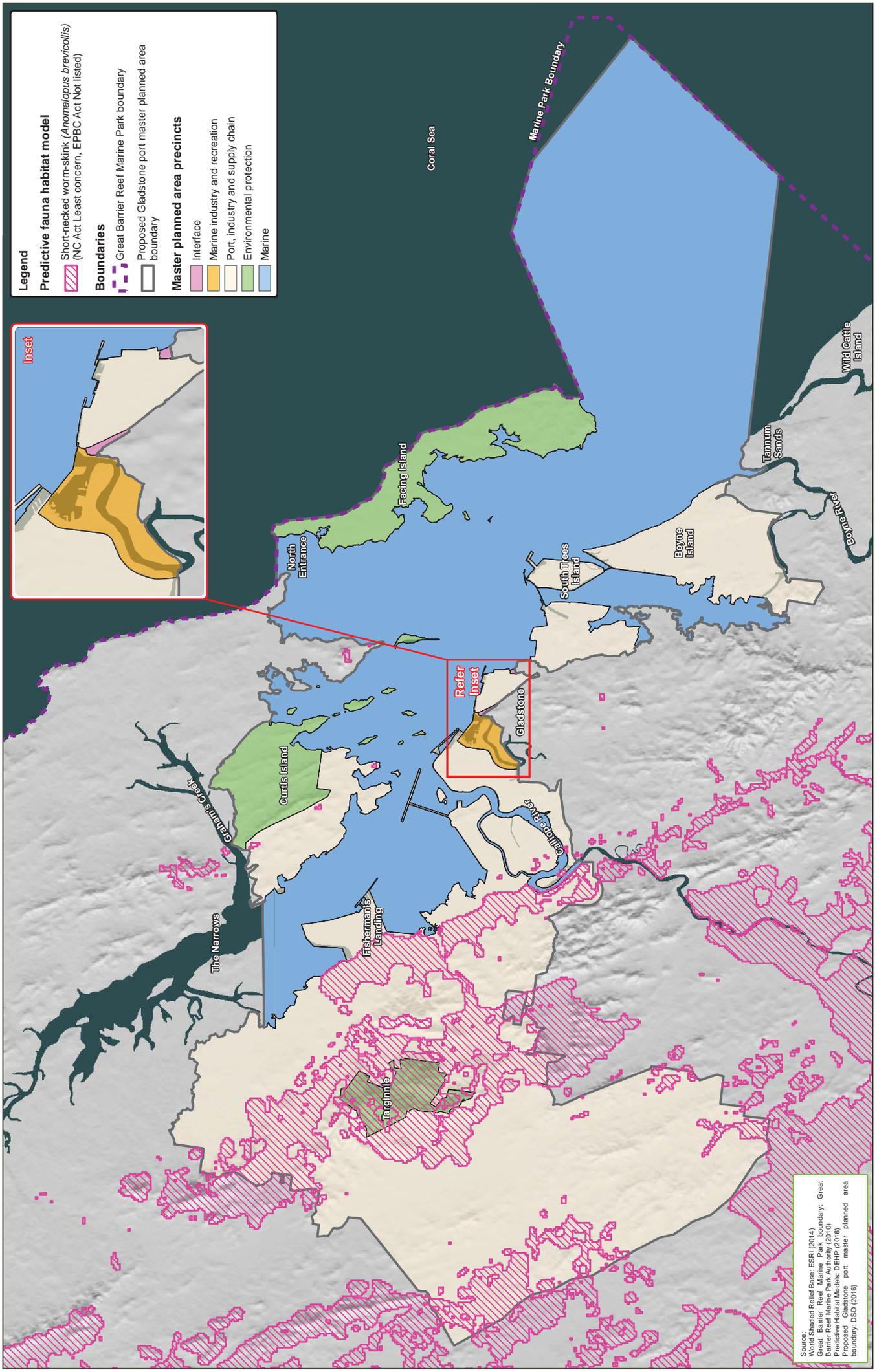
Modelled potential habitat for selected threatened flora and fauna species



Source: Aerial, GPC (2015) and DigitalGlobe Web Map Service (2013), Fauna Habitat Model, DEHP (2016), Proposed Gladstone port master planned area boundary, DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 2511469
 Coordinate system: GDA 1994 MGA Zone 56



Legend

Predictive fauna habitat model
Short-necked worm-skink (*Anomalopus brevicollis*)
(NC Act Least concern, EPBC Act Not listed)

Boundaries
Great Barrier Reef Marine Park boundary
Proposed Gladstone port master planned area boundary

Master planned area precincts
Interface
Marine industry and recreation
Port, industry and supply chain
Environmental protection
Marine



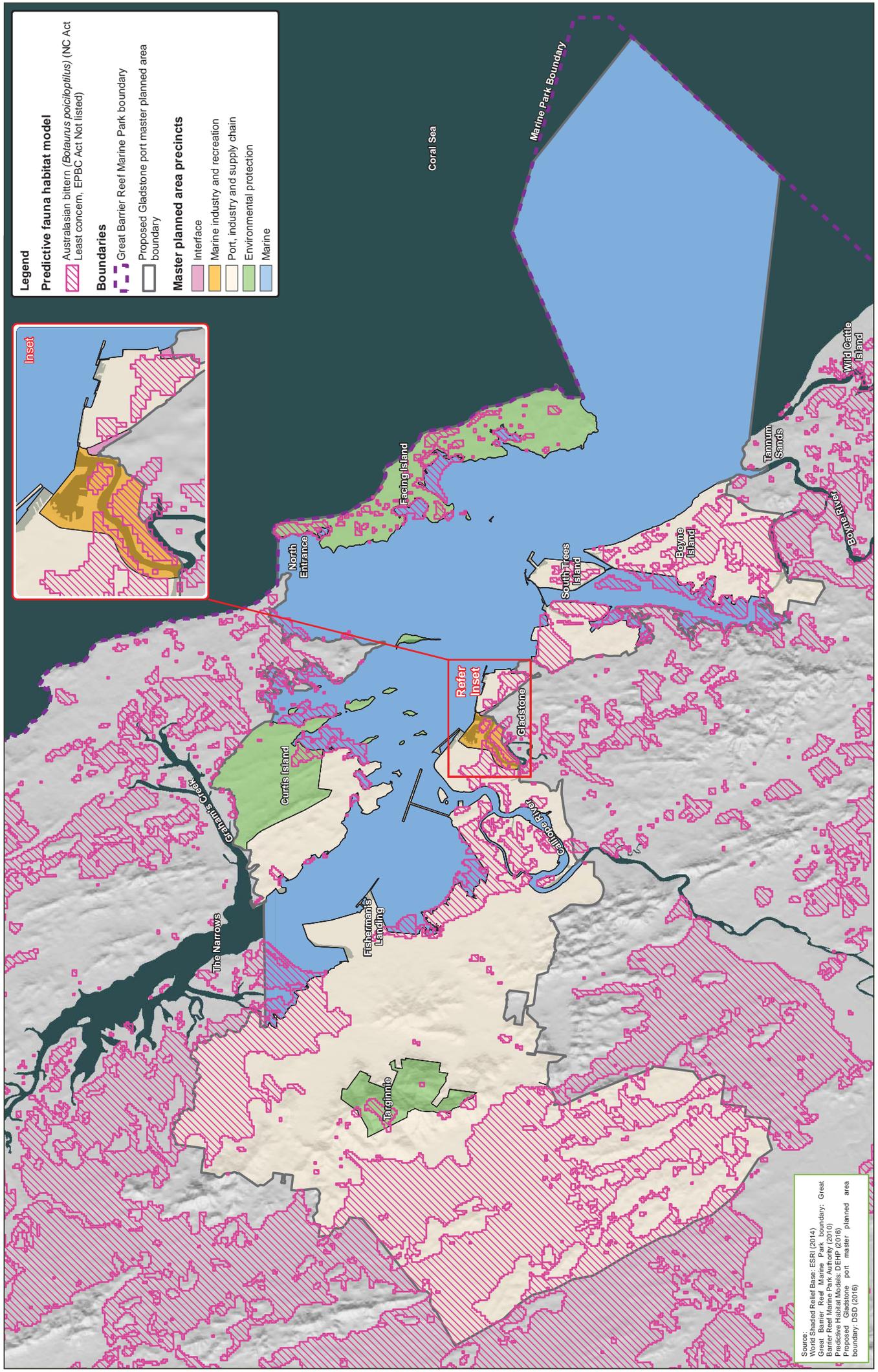
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Source:
World Shaded Relief Base: ESRI (2014)
Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
Predictive Fauna Habitat Model: DDEP (2016)
Proposed Gladstone port master planned area boundary: DSD (2016)

0 2,000 4,000 Metres

Date: 22/08/2016 Version: 5 Job No: 251469
Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.2: Predictive fauna habitat model - Short-necked worm-skink (*Anomalopus brevicollis*)
developed by the Department of Environment and Heritage Protection



Legend

Predictive fauna habitat model
 Australasian bittern (*Botaurus poiciloptilus*) (NC Act Least concern, EPBC Act Not listed)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

Map by: RB
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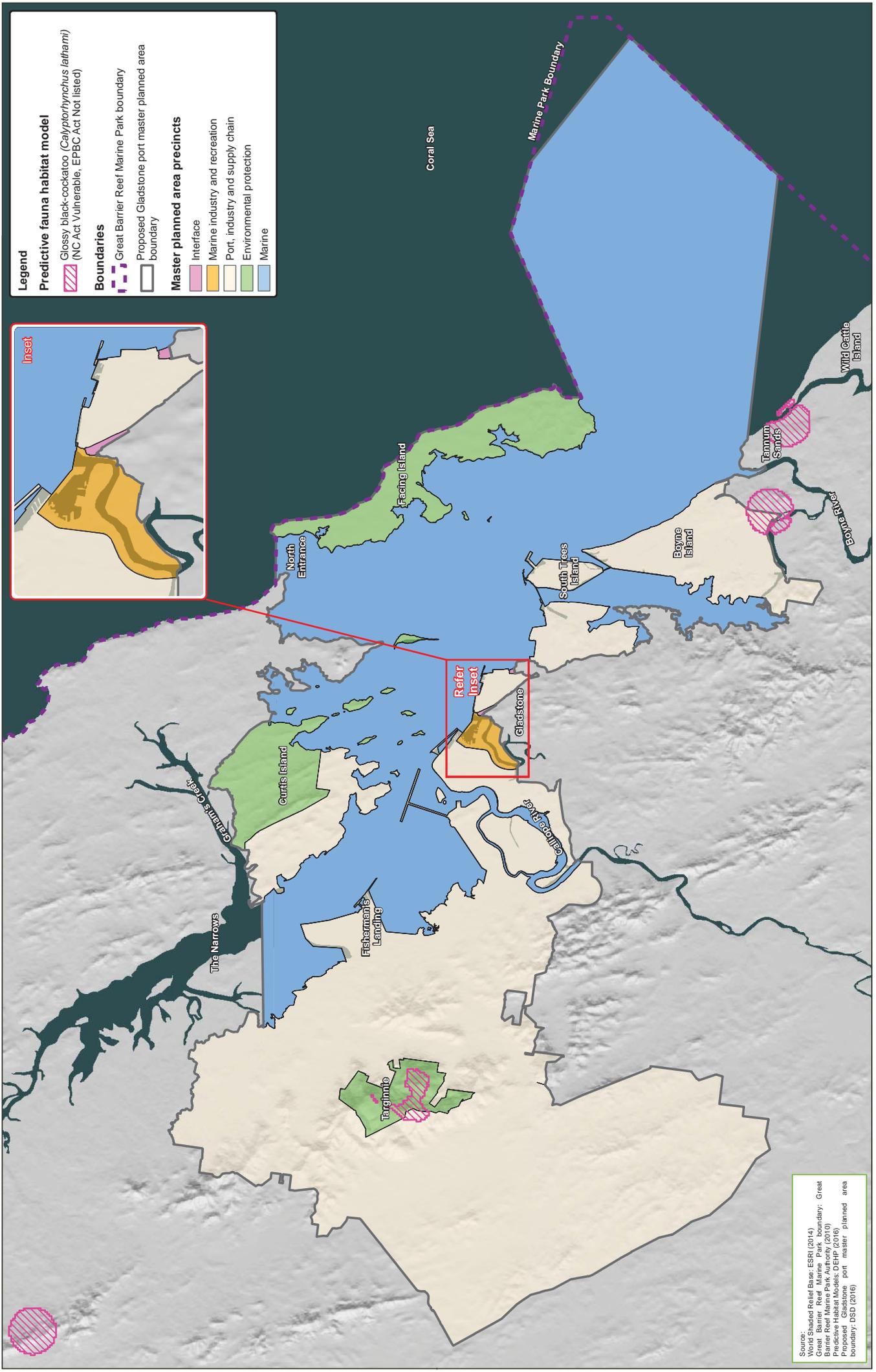
Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Planning Precincts: DSD (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

0 2,000 4,000 Metres

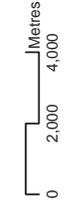
Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment

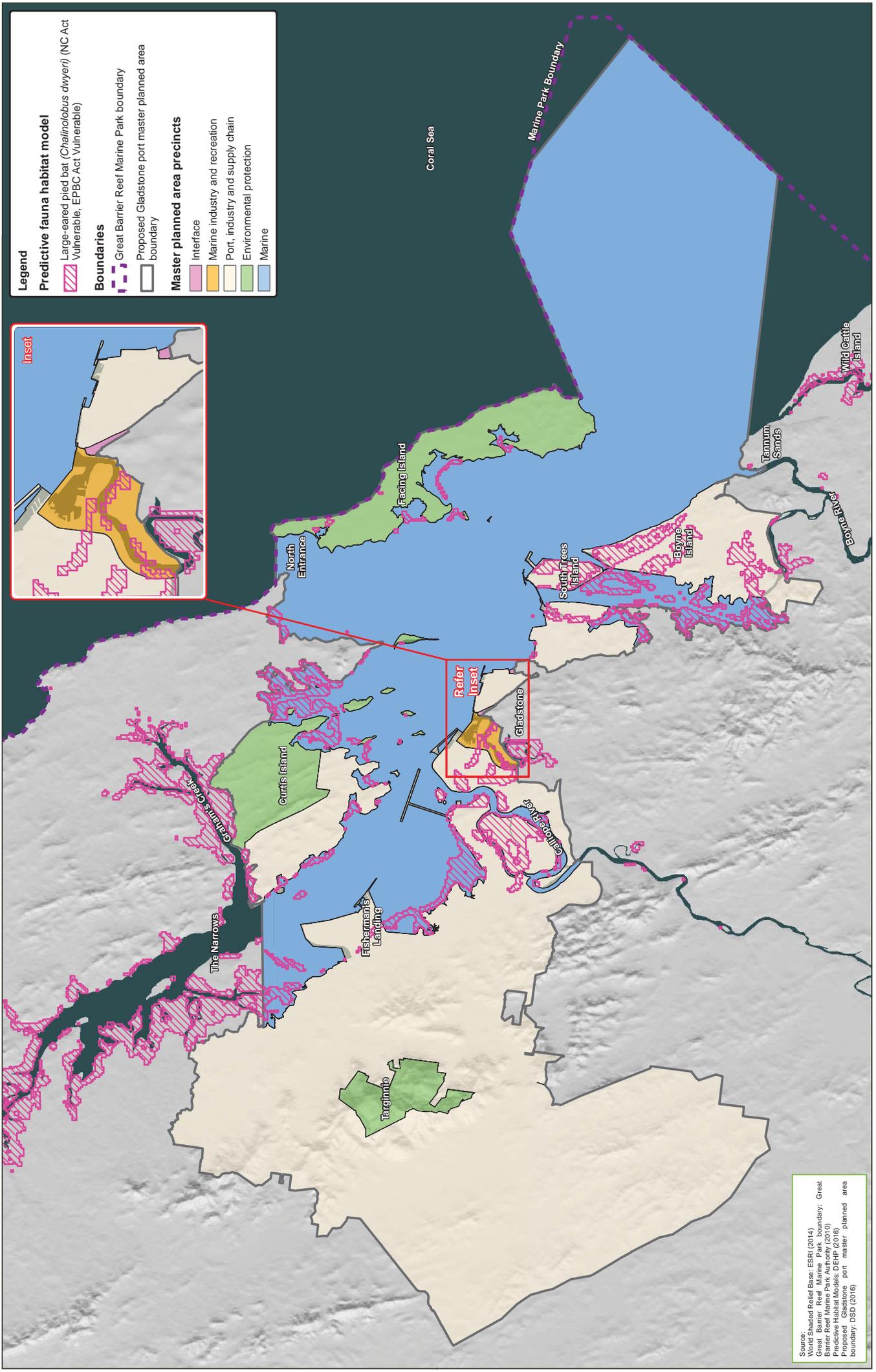
Figure B.3: Predictive fauna habitat model - Australasian bittern (*Botaurus poiciloptilus*) developed by the Department of Environment and Heritage Protection



Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Fauna Habitat Model: Aurecon (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Gladstone port master planning risk assessment
 Figure B.4: Predictive fauna habitat model - Glossy black-cockatoo (*Calyptorhynchus lathami*) developed by the Department of Environment and Heritage Protection



Legend

Predictive fauna habitat model
 Large-eared pied bat (*Chalinolobus dwyeri*) (NC Act Vulnerable, EPBC Act Vulnerable)

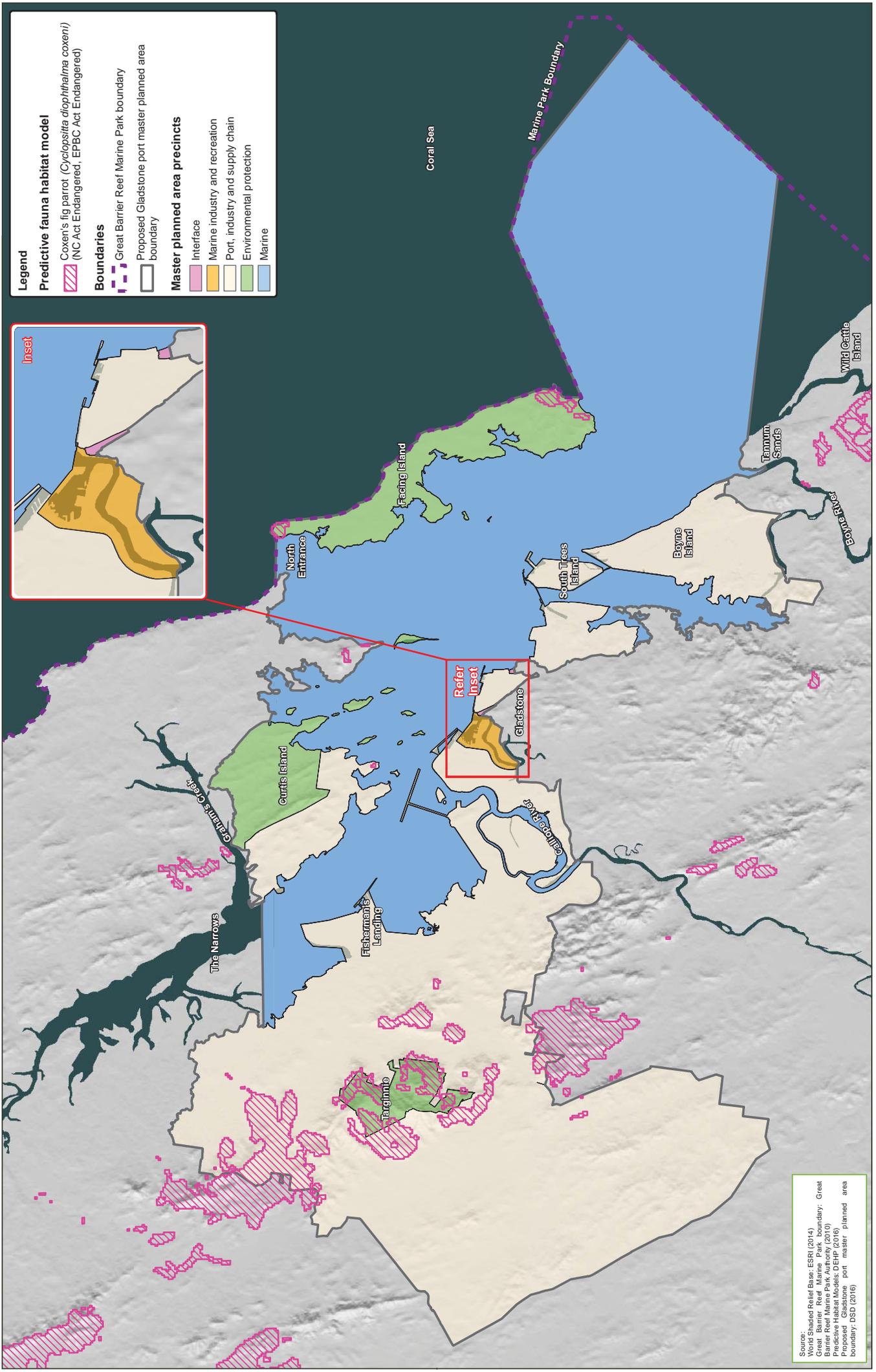
Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Planning Precincts: Gladstone Port Master Planning (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

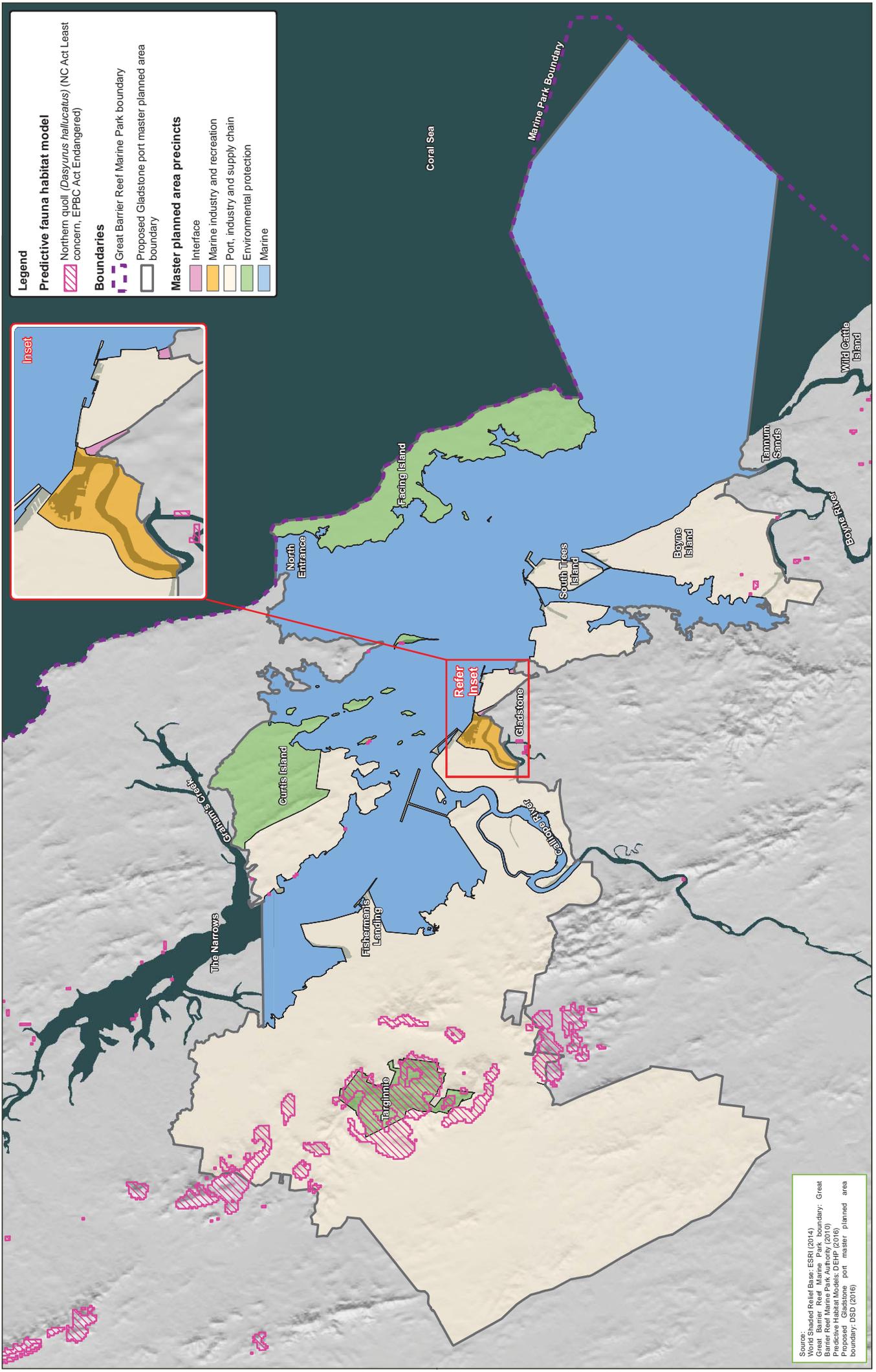


Gladstone port master planning risk assessment
 Figure B.5: Predictive fauna habitat model - Large-eared pied bat (*Chalinolobus dwyeri*) developed by the Department of Environment and Heritage Protection



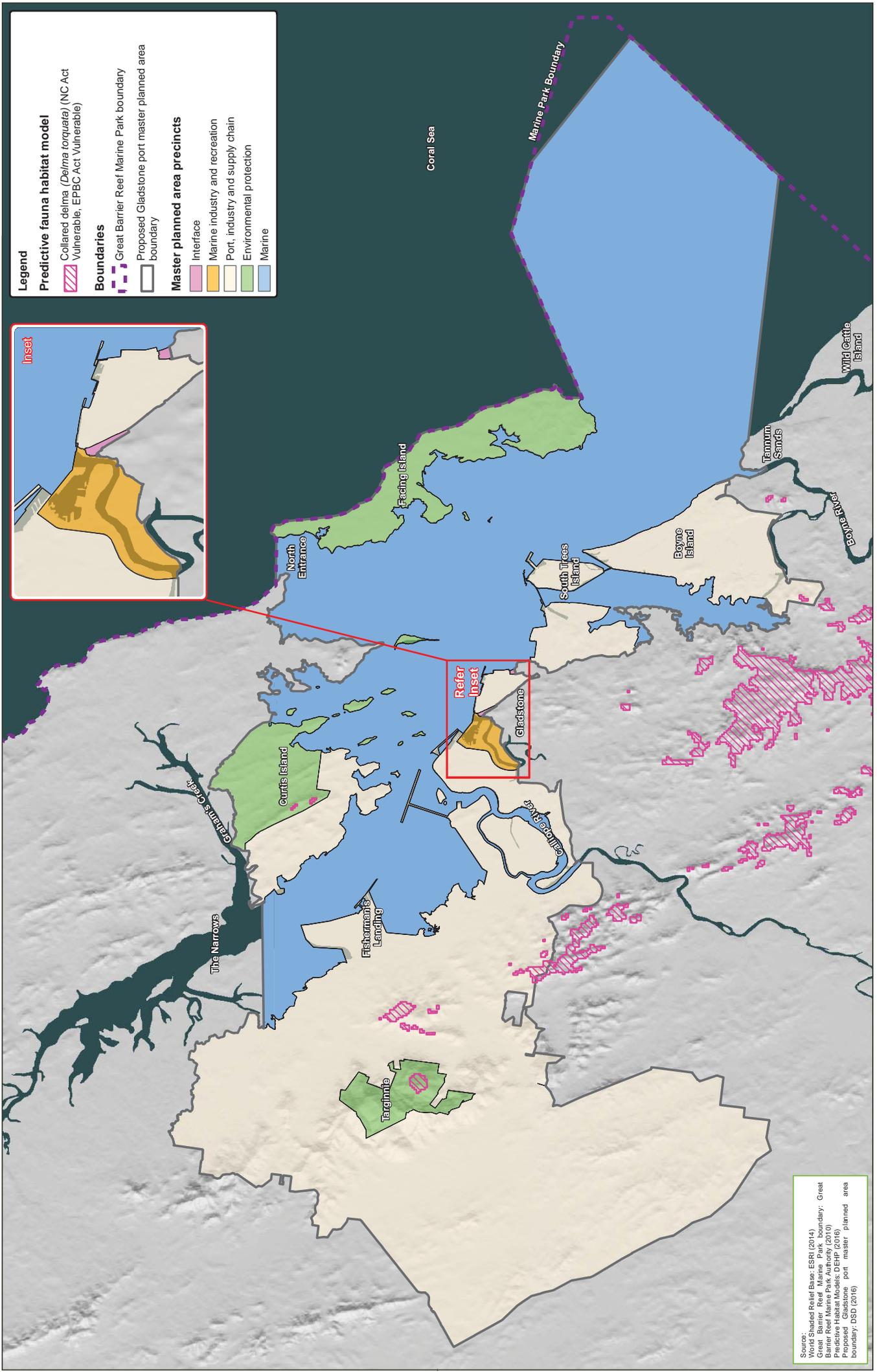
Gladstone port master planning risk assessment
Figure B.6: Predictive fauna habitat model - Coxen's fig parrot (*Cyclopsitta diophthalma coxeni*)
 developed by the Department of Environment and Heritage Protection





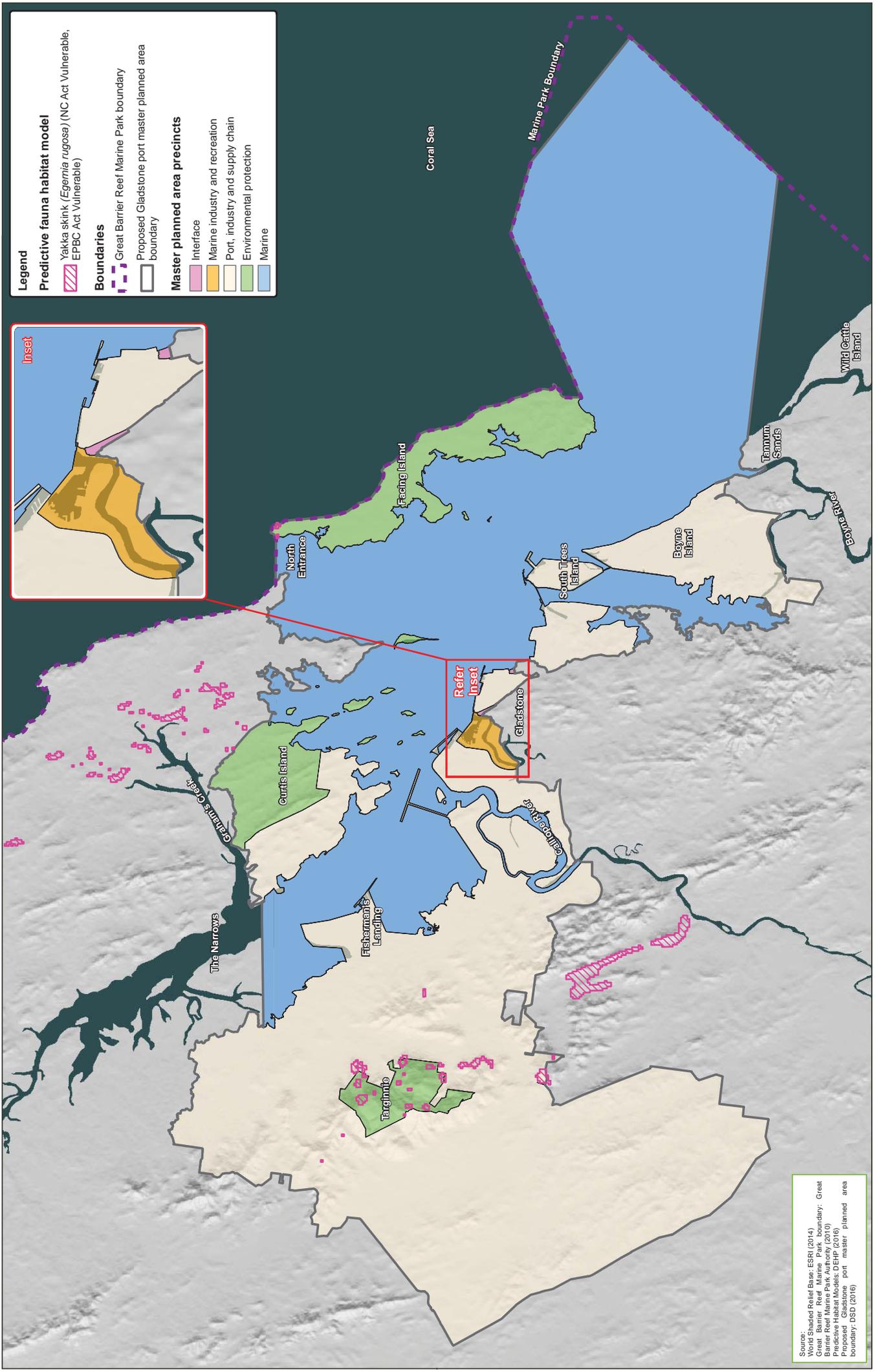
Gladstone port master planning risk assessment
 Predictive fauna habitat model - Northern quoll (*Dasyurus hallucatus*)
 developed by the Department of Environment and Heritage Protection



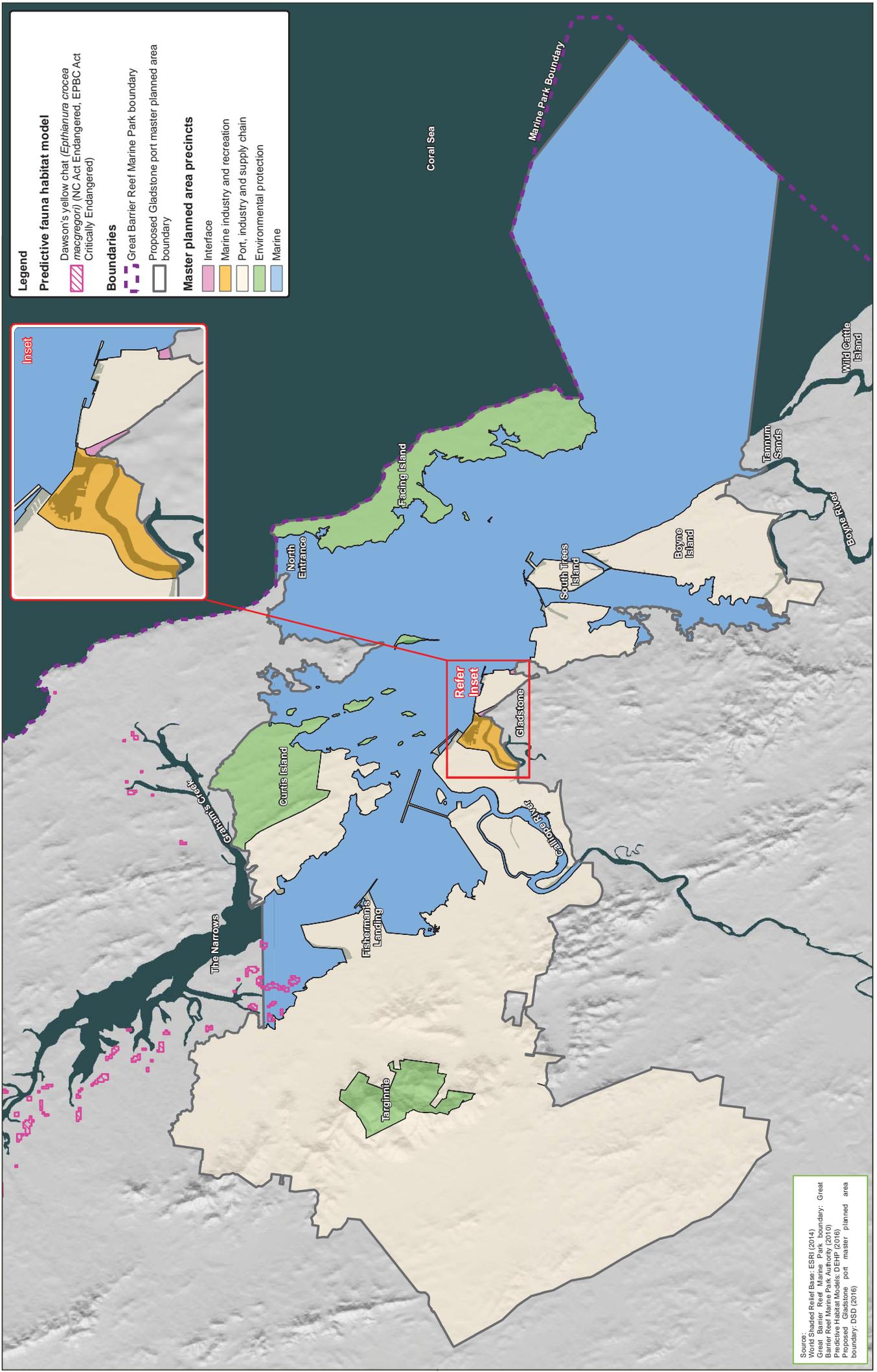


Gladstone port master planning risk assessment
Figure B.8: Predictive fauna habitat model - Collared delma (*Delima torquata*)
 developed by the Department of Environment and Heritage Protection

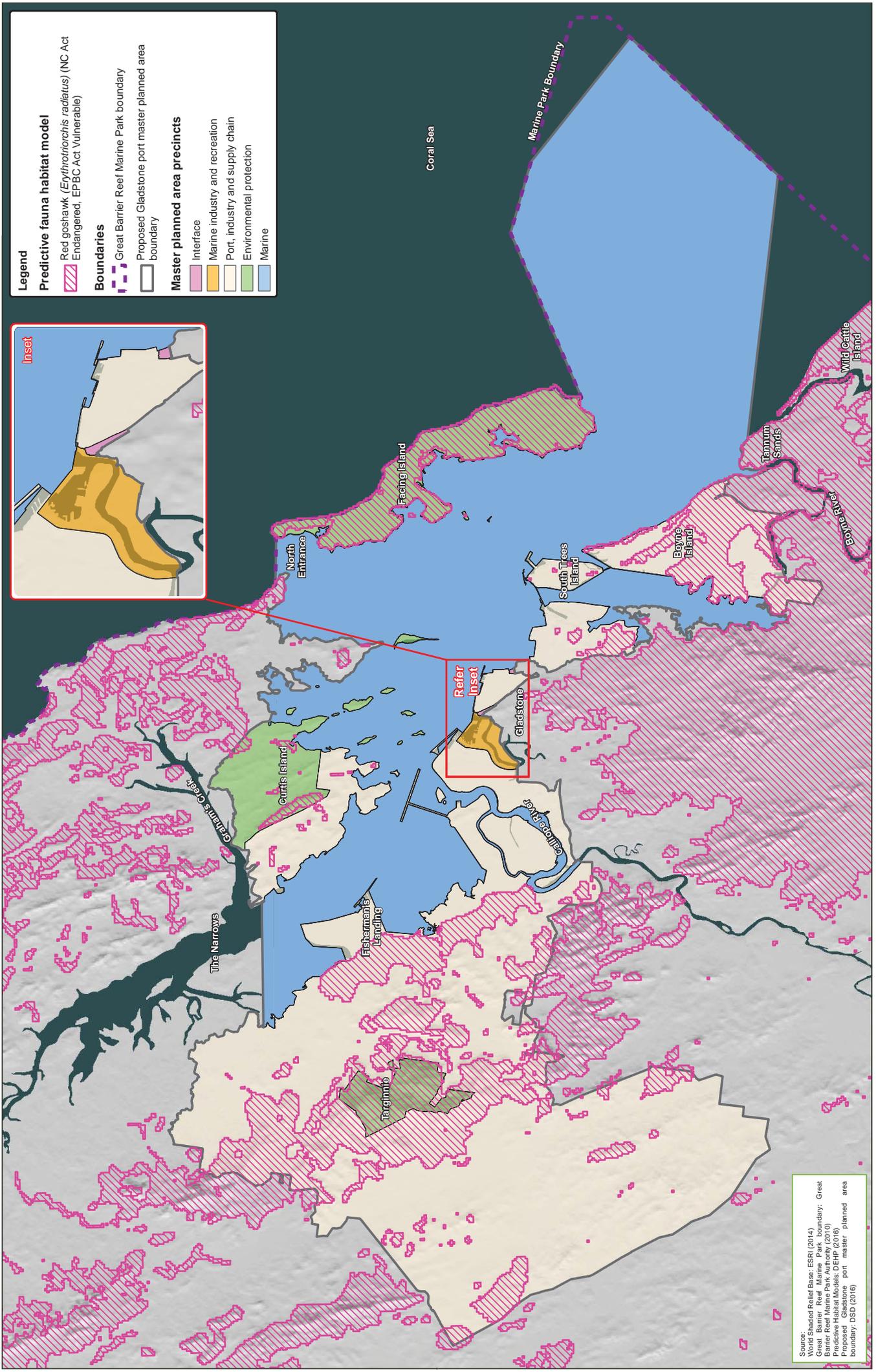




Gladstone port master planning risk assessment
Figure B.9: Predictive fauna habitat model - Yakka skink (*Egernia rugosa*)
 developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
 Predictive fauna habitat model - Dawson's yellow chat (*Epthianura crocea macgregori*) developed by the Department of Environment and Heritage Protection



Legend

Predictive fauna habitat model
 Red goshawk (*Erythrorchis radiatus*) (NC Act Endangered, EPBC Act Vulnerable)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

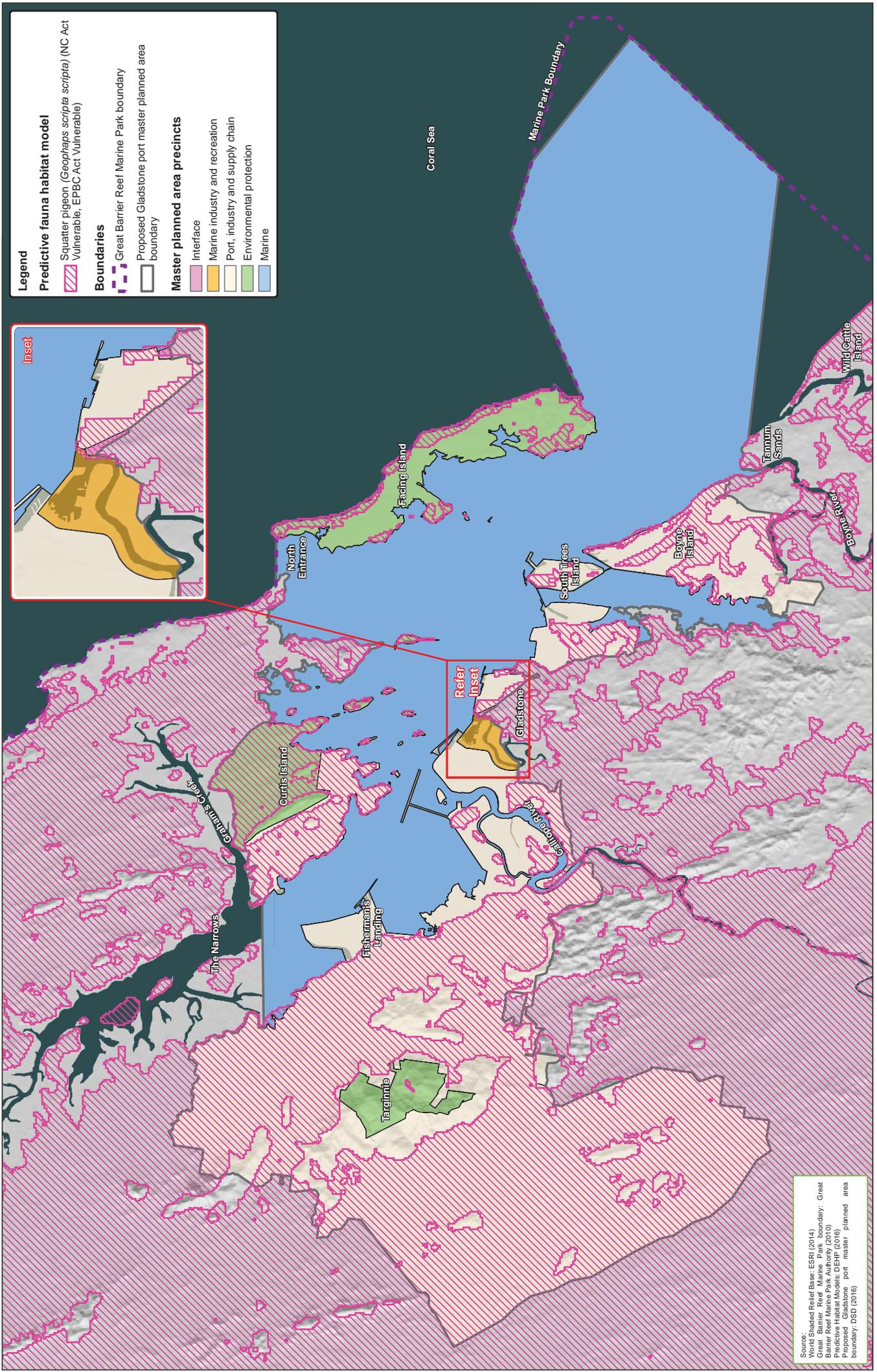
Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Fauna Habitat Model: DPIP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



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Gladstone port master planning risk assessment
 Figure B.11: Predictive fauna habitat model - Red goshawk (*Erythrorchis radiatus*) developed by the Department of Environment and Heritage Protection



Legend

Predictive fauna habitat model

- Squatter pigeon (*Geopheaps scripta scripta*) (NC Act Vulnerable, EPBC Act Vulnerable)

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

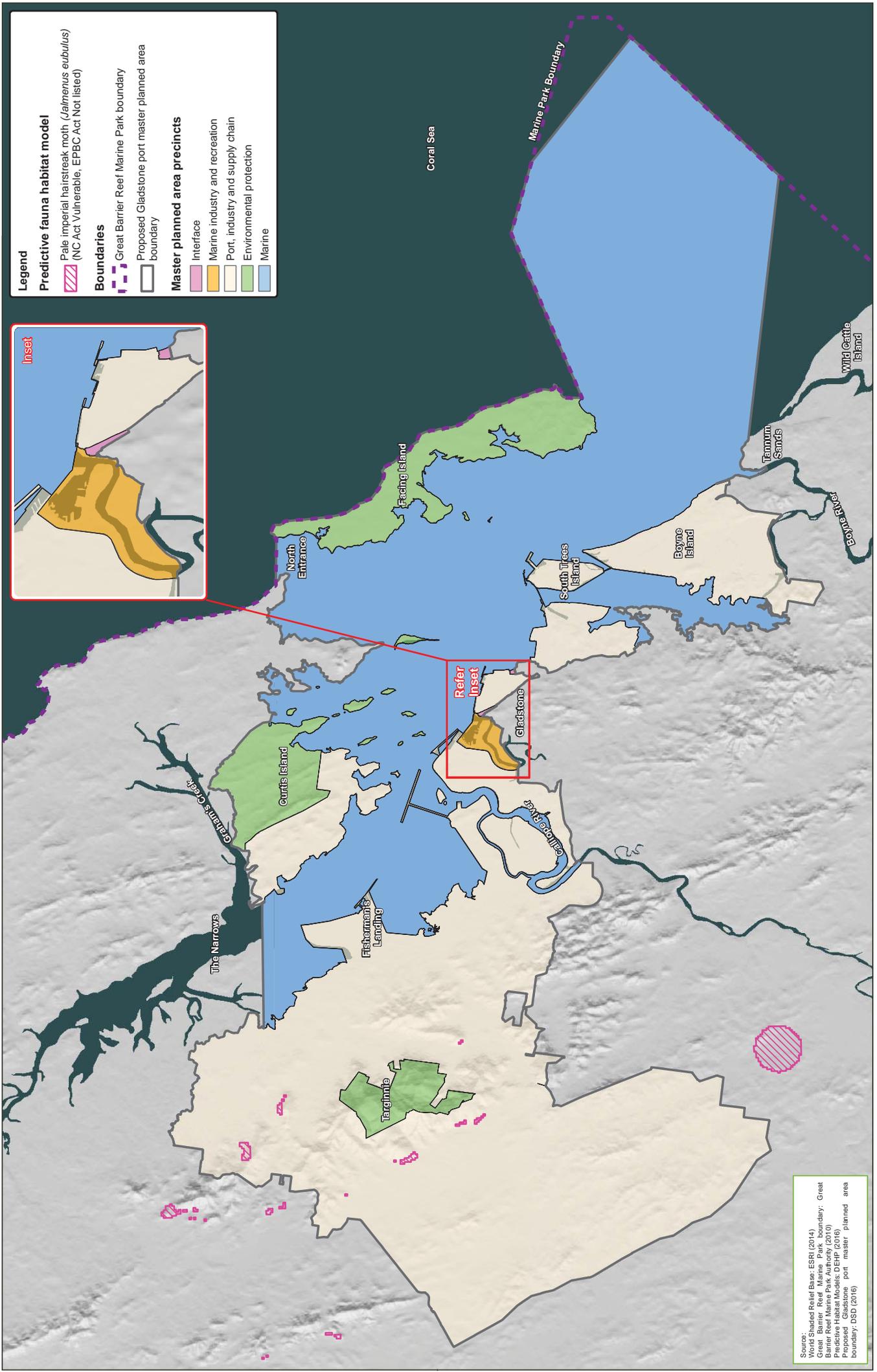
- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Fauna Habitat Model: DEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



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 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.12: Predictive fauna habitat model - Squatter pigeon (*Geopheaps scripta scripta*)
 developed by the Department of Environment and Heritage Protection

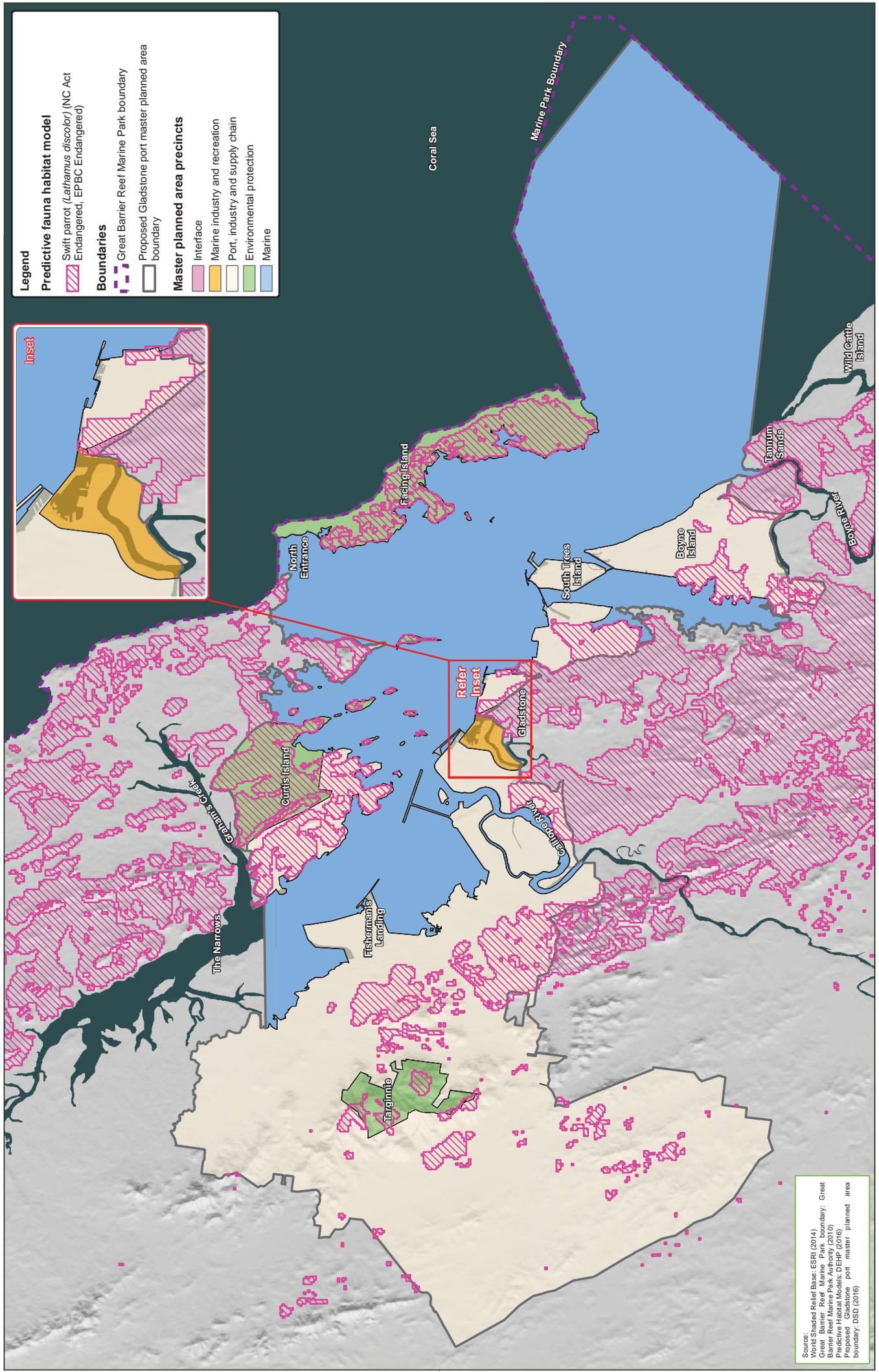


Gladstone port master planning risk assessment

Figure B.13: Predictive fauna habitat model - Pale imperial hairstreak moth (*Jaimeus eubulus*) developed by the Department of Environment and Heritage Protection

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Legend

Predictive fauna habitat model
 Swift parrot (*Lathamus discolor*) (NC Act Endangered, EPBC Endangered)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

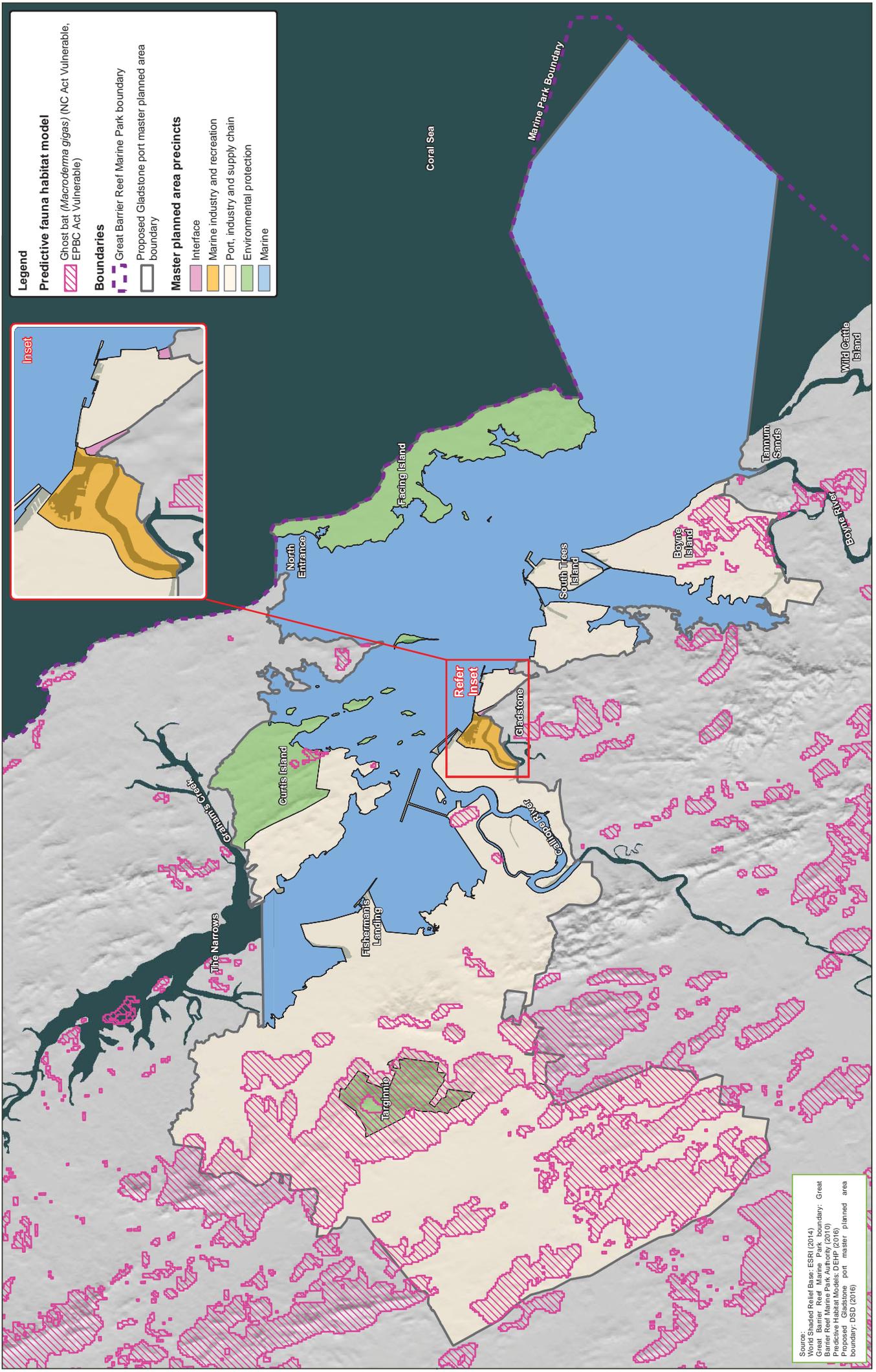
Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Fauna Habitat Model: Aurecon (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



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 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
 Figure B.14: Predictive fauna habitat model - Swift parrot (*Lathamus discolor*) developed by the Department of Environment and Heritage Protection



Legend

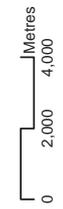
Predictive fauna habitat model
 Ghost bat (*Macroderma gigas*) (NC Act Vulnerable, EPBC Act Vulnerable)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

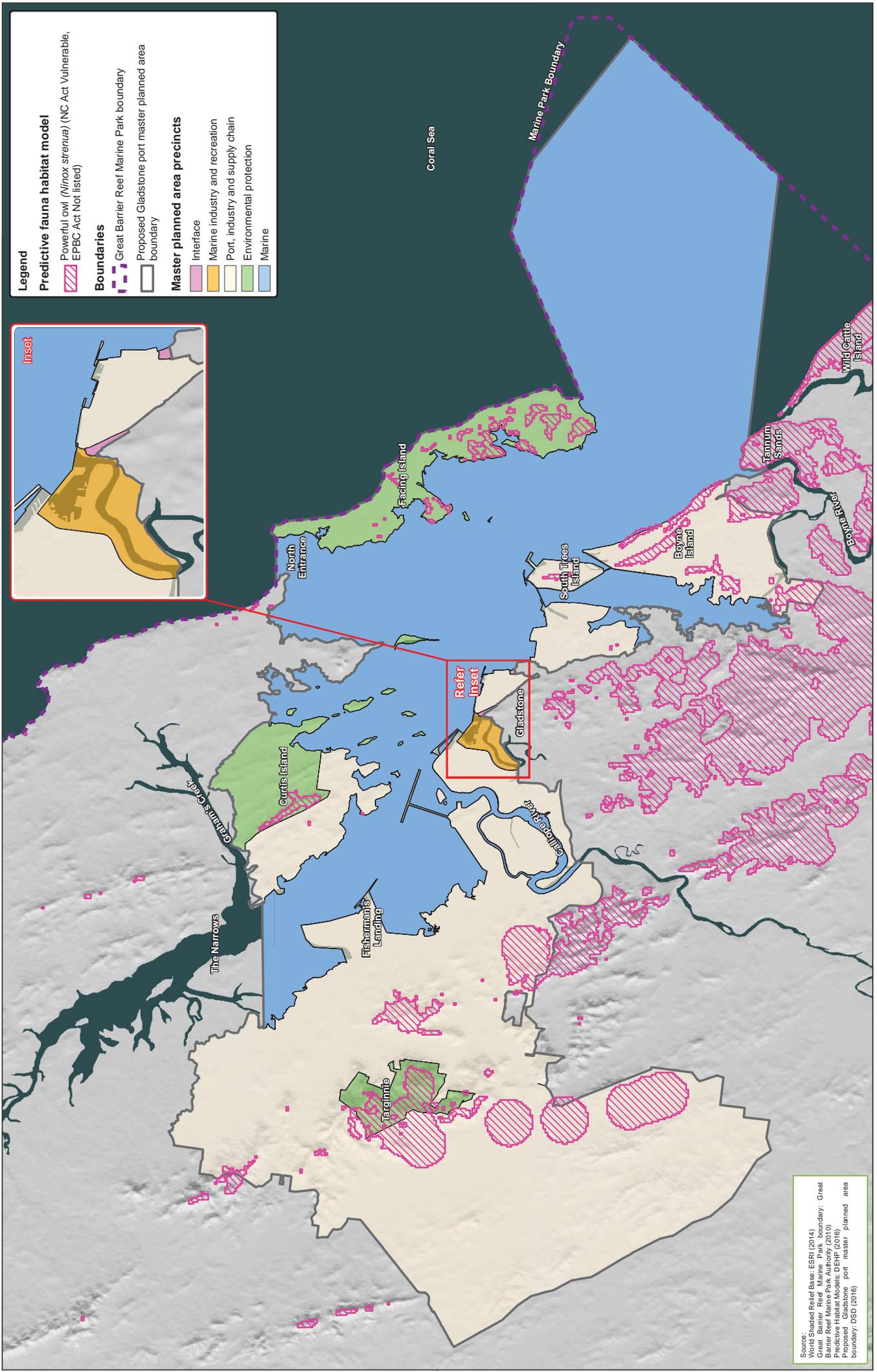
Map by: RB
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Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Planning Precincts: DSD (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

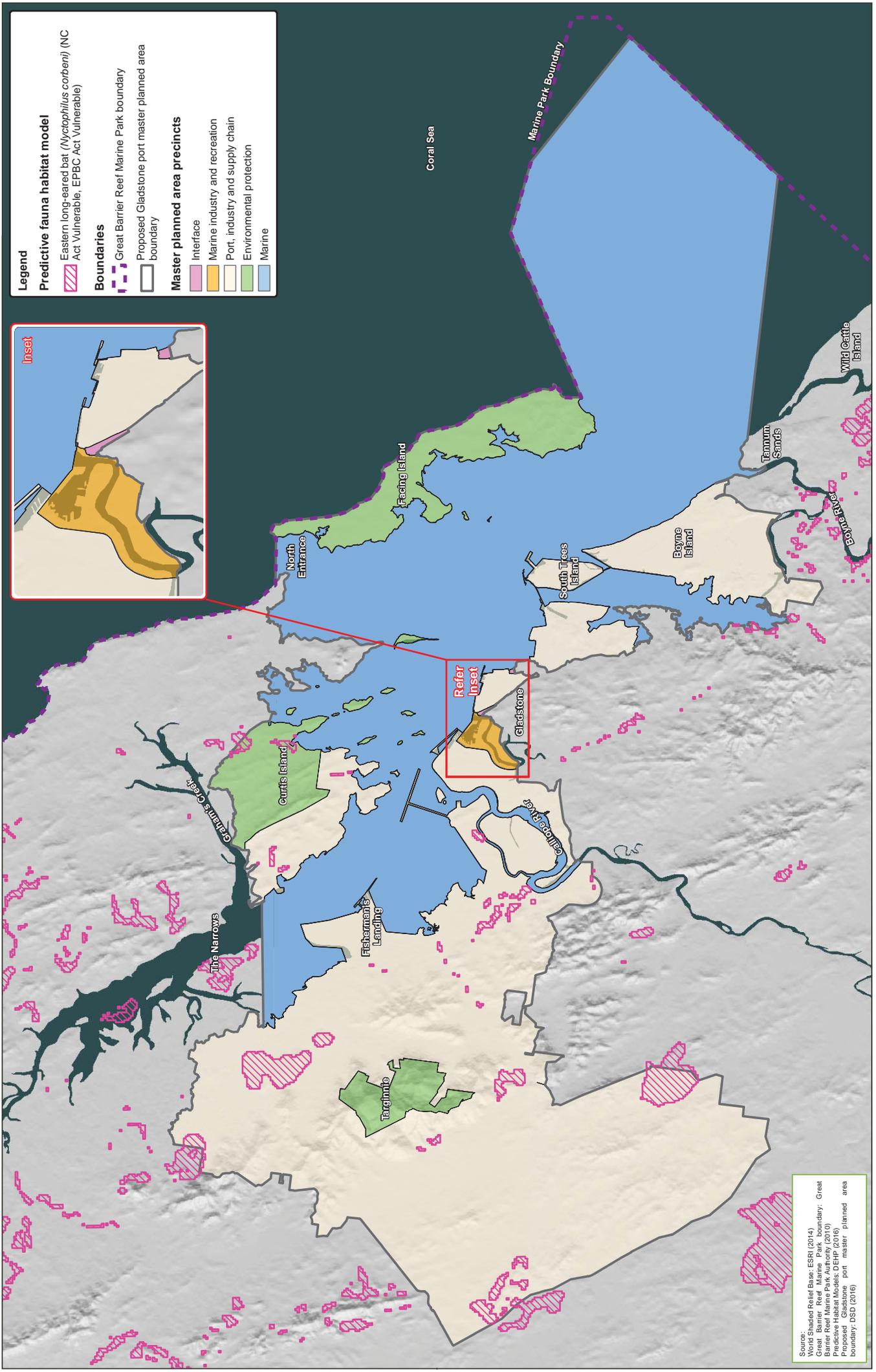


Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.15: Predictive fauna habitat model - Ghost bat (*Macroderma gigas*)
 developed by the Department of Environment and Heritage Protection

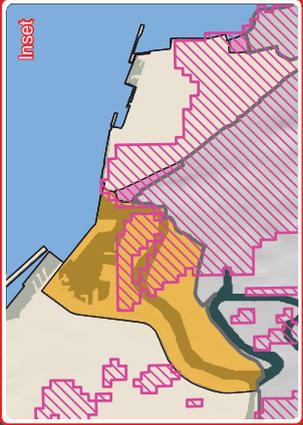
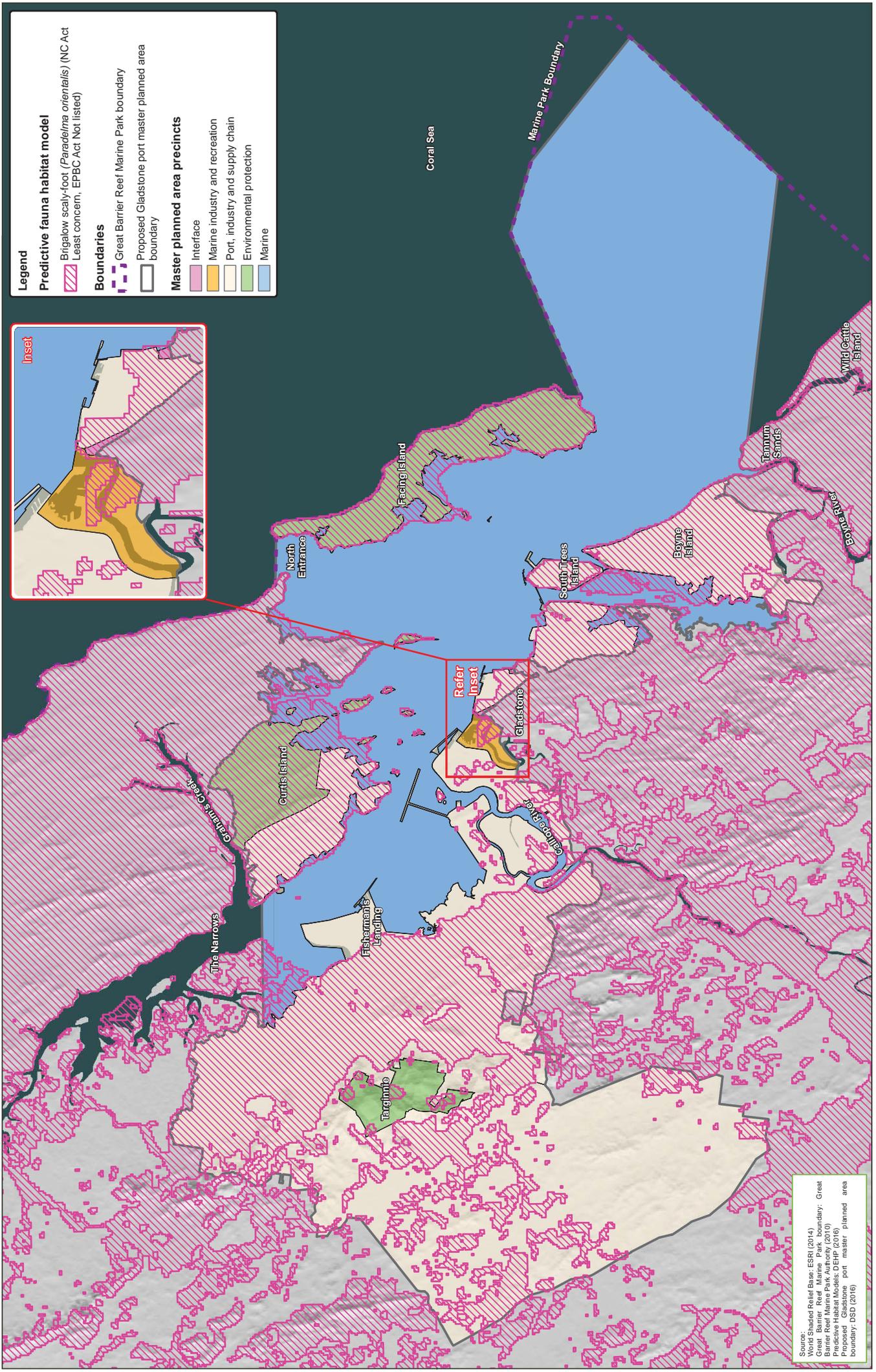


Gladstone port master planning risk assessment
Figure B.16: Predictive fauna habitat model - Powerful owl (*Ninox strenua*)
 developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
 Figure B.17: Predictive fauna habitat model - Eastern long-eared bat (*Nyctophilus corbeni*) developed by the Department of Environment and Heritage Protection





Legend

Predictive fauna habitat model

- Brigalow scaly-foot (*Paradelma orientalis*) (NC Act Least concern, EPBC Act Not listed)

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

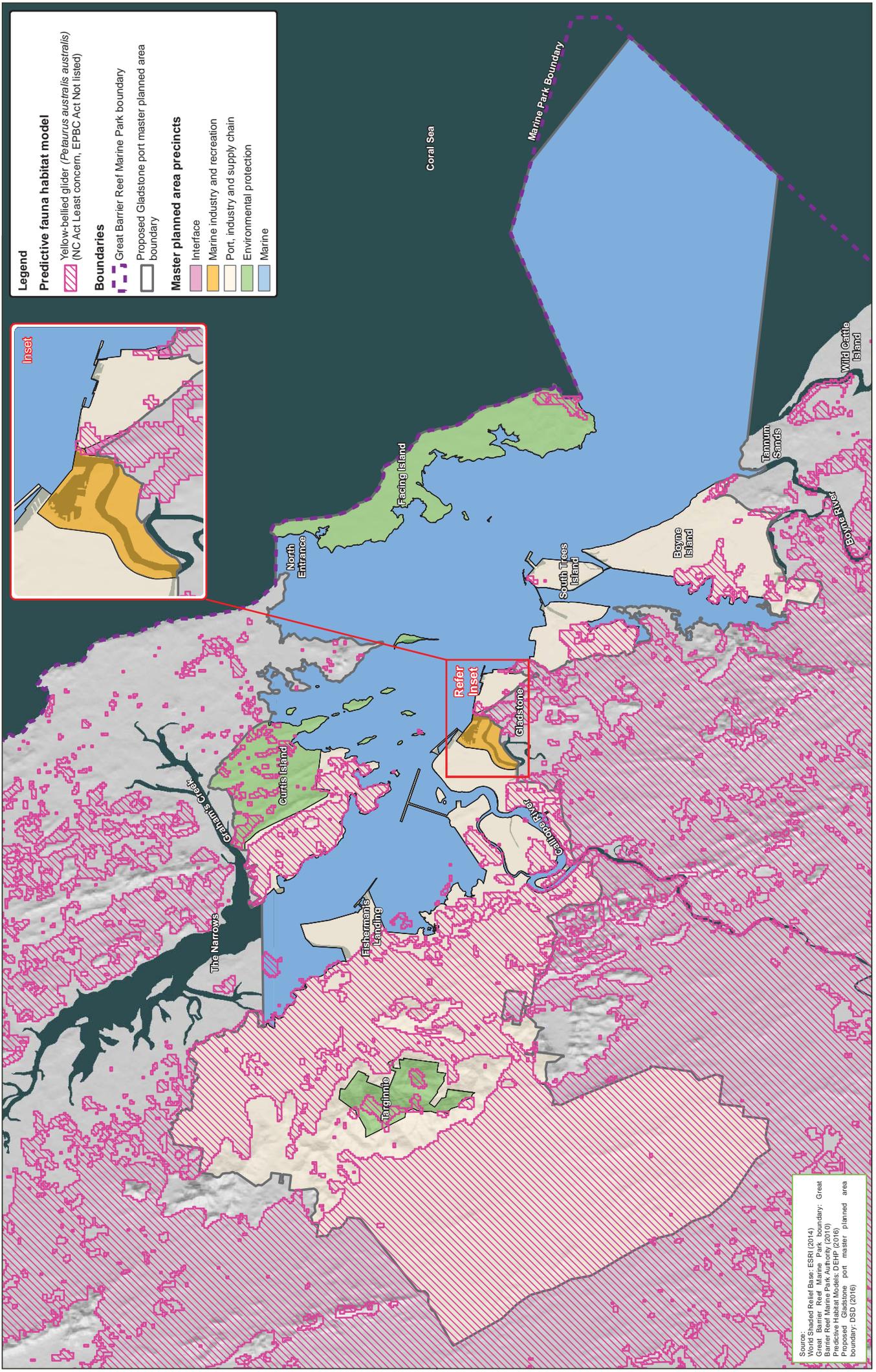
- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2014)
 Predictive Fauna Habitat Model: DDEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

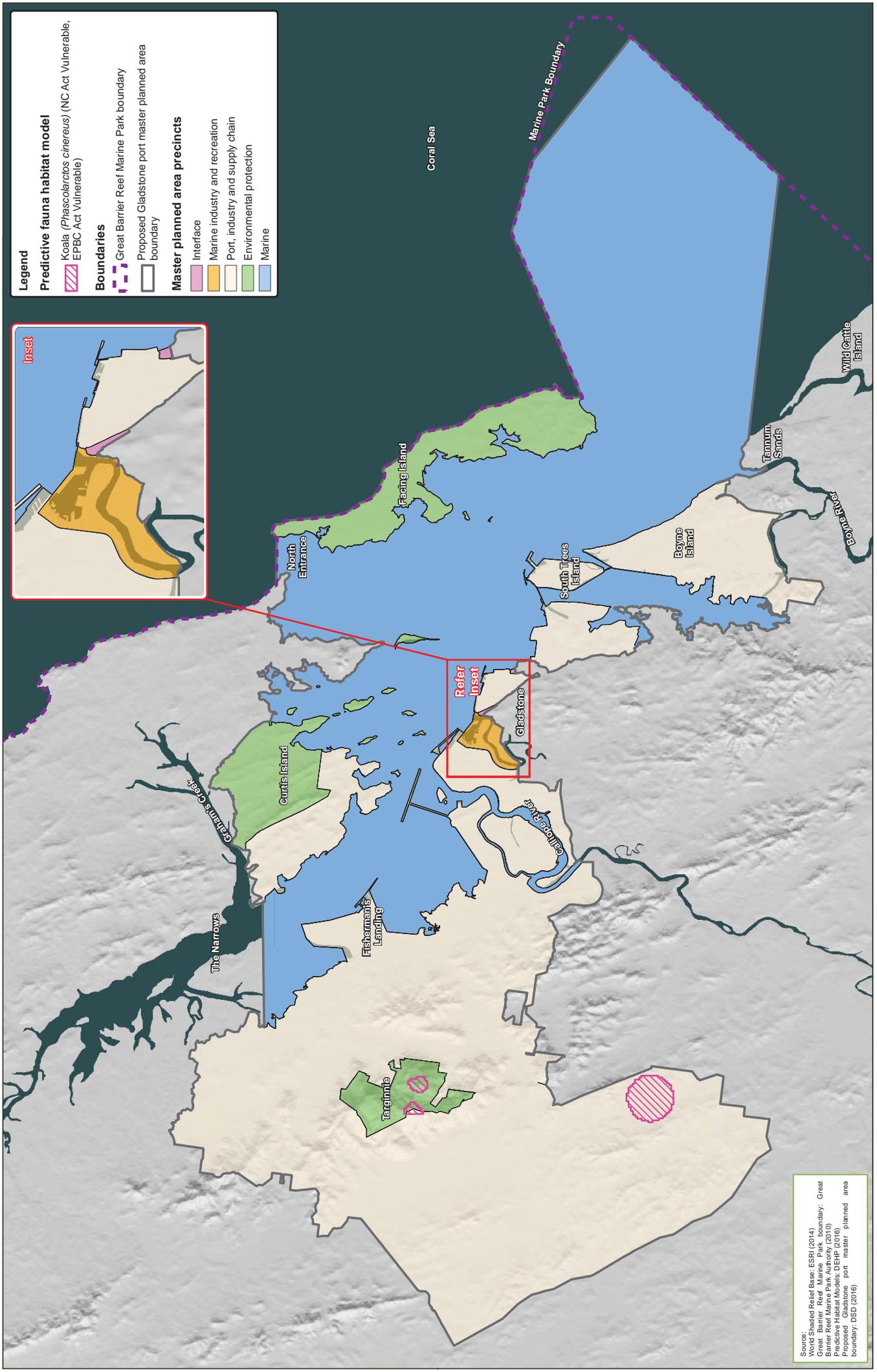


Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
 Figure B.18: Predictive fauna habitat model - Brigalow scaly-foot (*Paradelma orientalis*) developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
Figure B.19: Predictive fauna habitat model - Yellow-bellied glider (*Petaurus australis australis*)
 developed by the Department of Environment and Heritage Protection



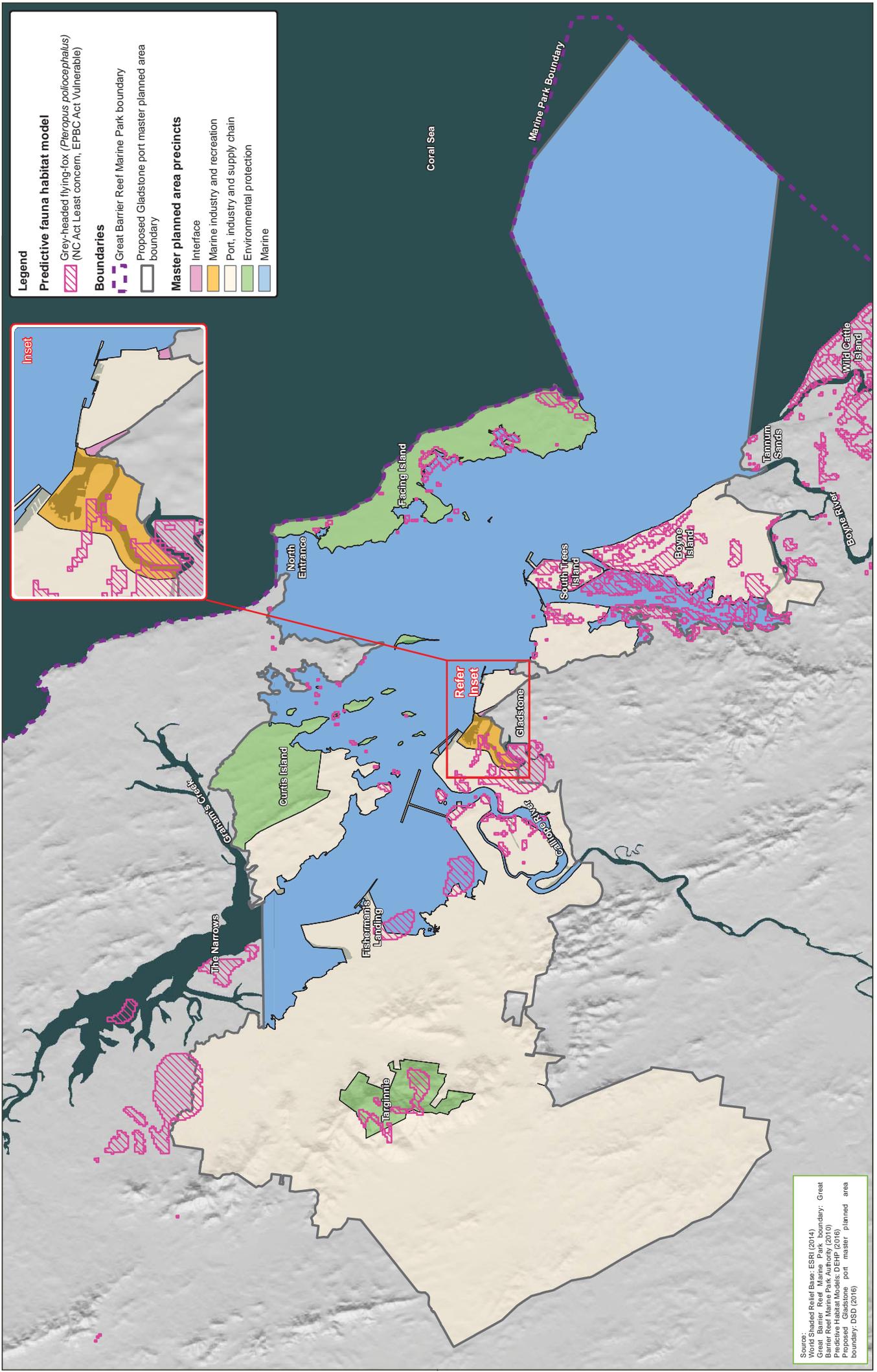
Legend

Predictive fauna habitat model
 Koala (*Phascolarctos cinereus*) (NC Act Vulnerable, EPBC Act Vulnerable)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

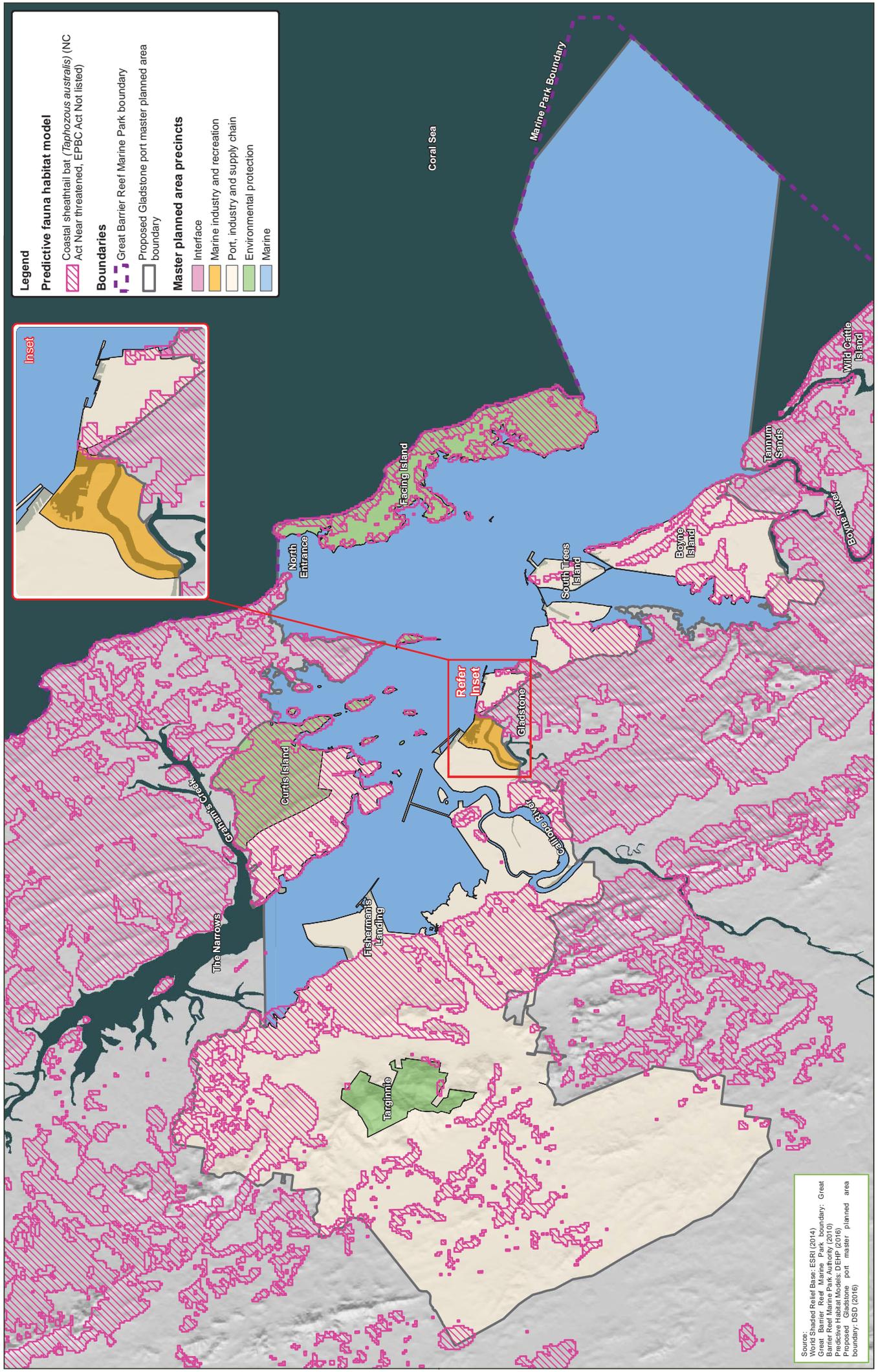
Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Fauna Habitat Model: Aurecon (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Gladstone port master planning risk assessment
Figure B.21: Predictive fauna habitat model - Grey-headed flying-fox (*Pteropus poliocephalus*)
 developed by the Department of Environment and Heritage Protection





Legend

Predictive fauna habitat model

- Coastal sheathail bat (*Taphozous australis*) (NC Act Near threatened, EPBC Act Not listed)

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

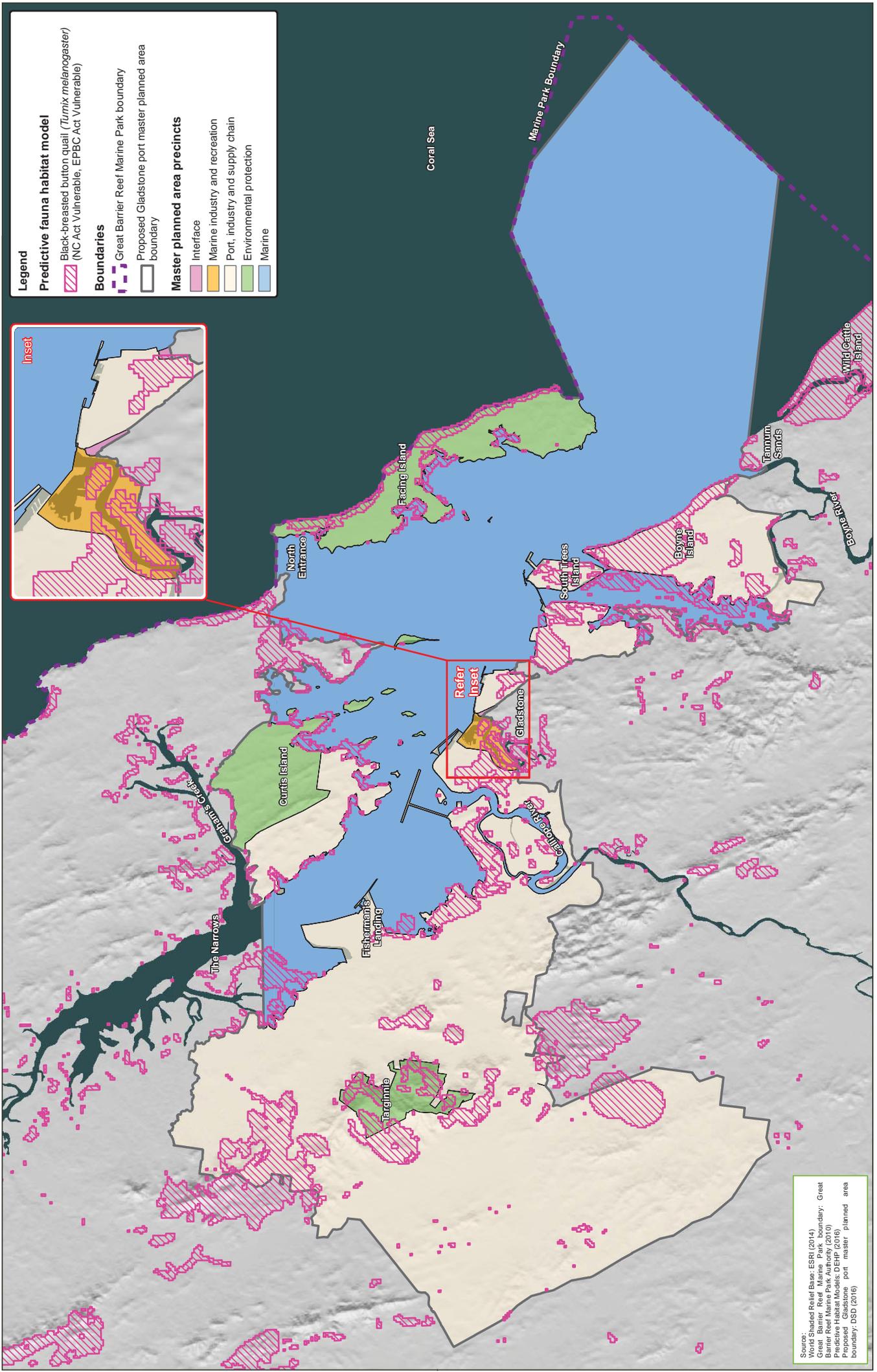
- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Planning Precincts: GDA (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



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 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.23: Predictive fauna habitat model - Coastal sheathail bat (*Taphozous australis*)
 developed by the Department of Environment and Heritage Protection



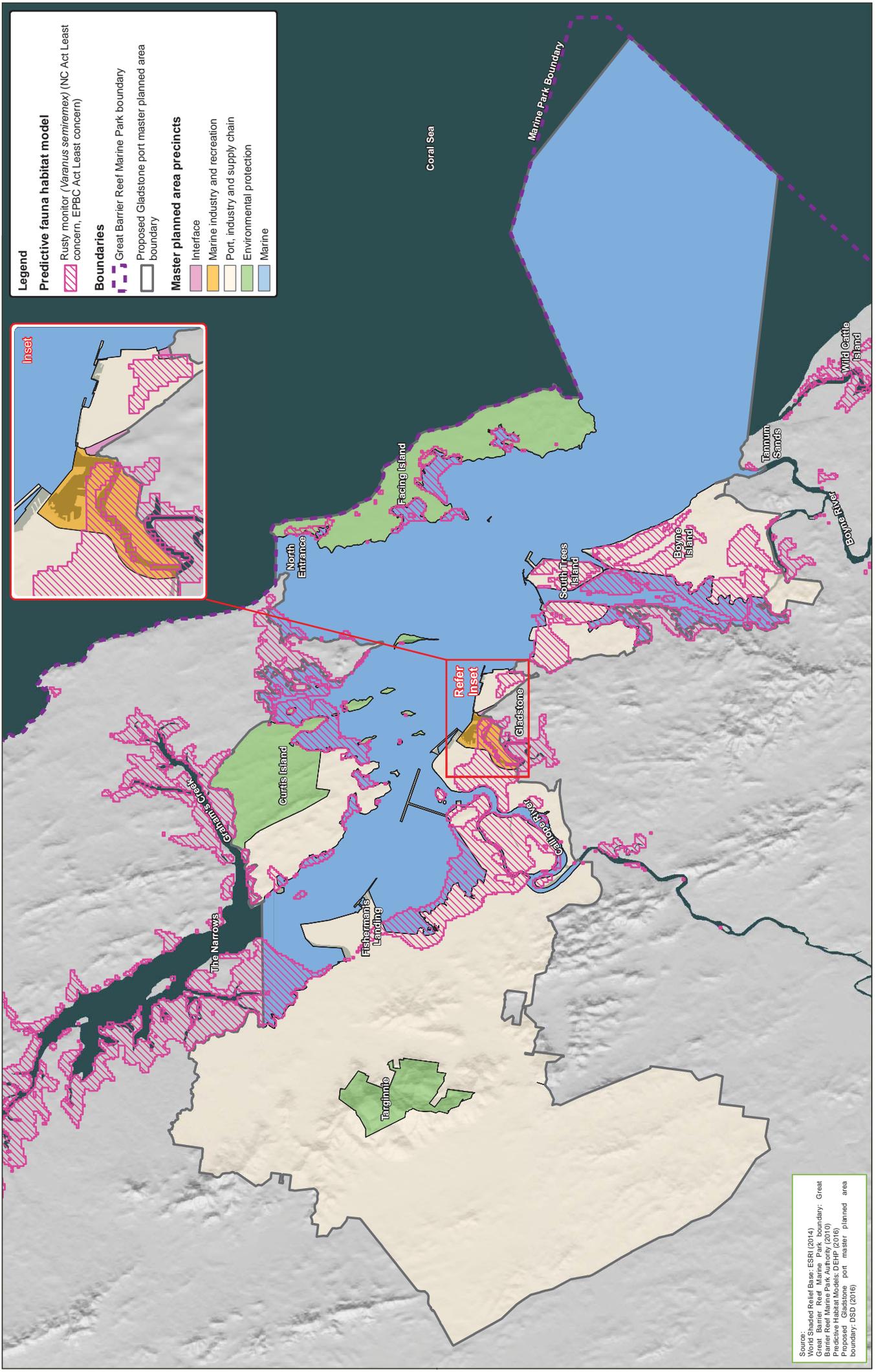
- Legend**
- Predictive fauna habitat model**
- Black-breasted button quail (*Turnix melanogaster*) (NC Act Vulnerable, EPBC Act Vulnerable)
- Boundaries**
- Great Barrier Reef Marine Park boundary
 - Proposed Gladstone port master planned area boundary
- Master planned area precincts**
- Interface
 - Marine industry and recreation
 - Port, industry and supply chain
 - Environmental protection
 - Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Fauna Habitat Model: DDEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.24: Predictive fauna habitat model - Black-breasted button quail (*Turnix melanogaster*)
 developed by the Department of Environment and Heritage Protection



Legend

Predictive fauna habitat model

- Rusty monitor (*Varanus semiremex*) (NC Act Least concern, EPBC Act Least concern)

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

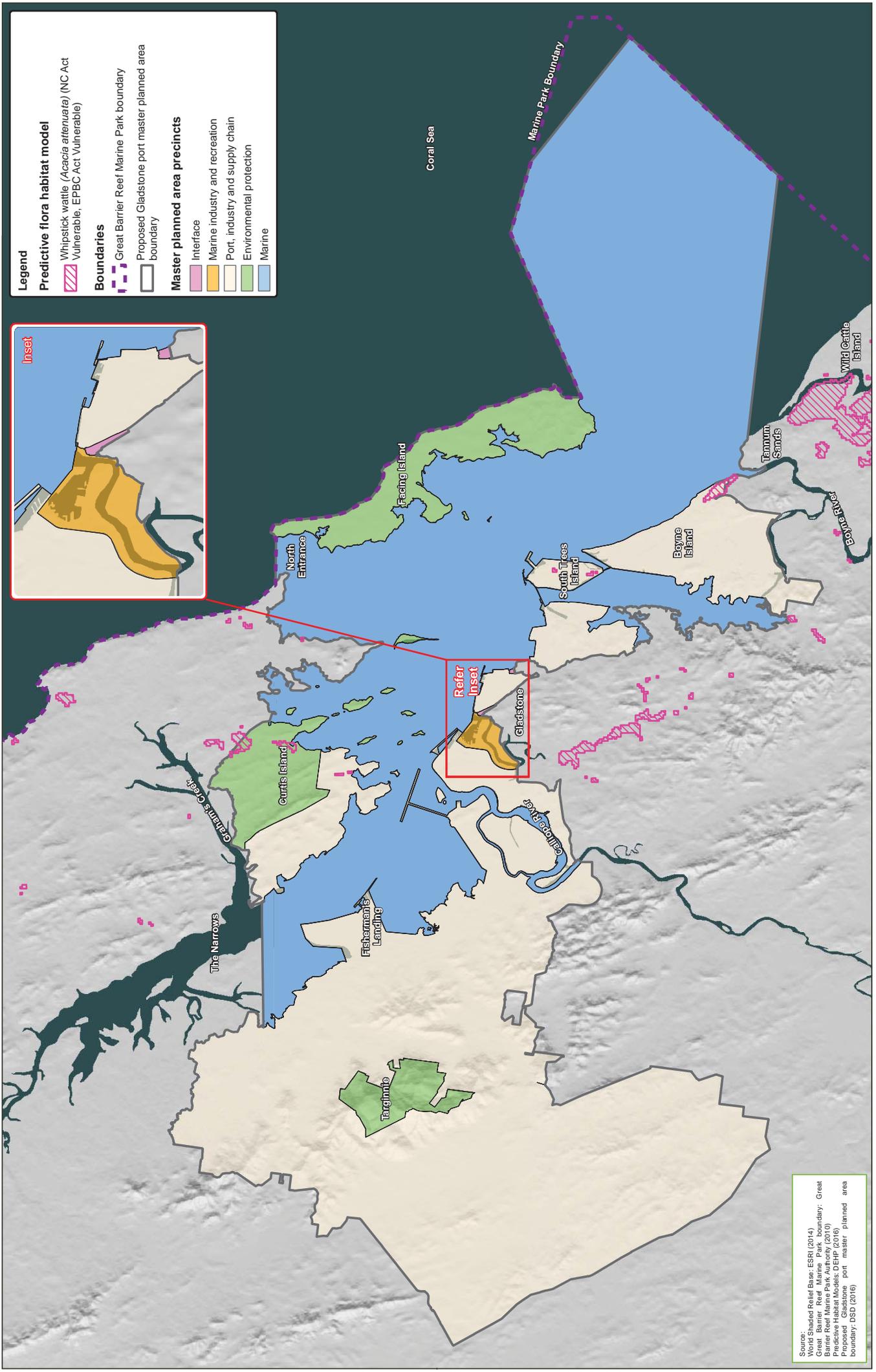
- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Fauna Habitat Model: Aurecon (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

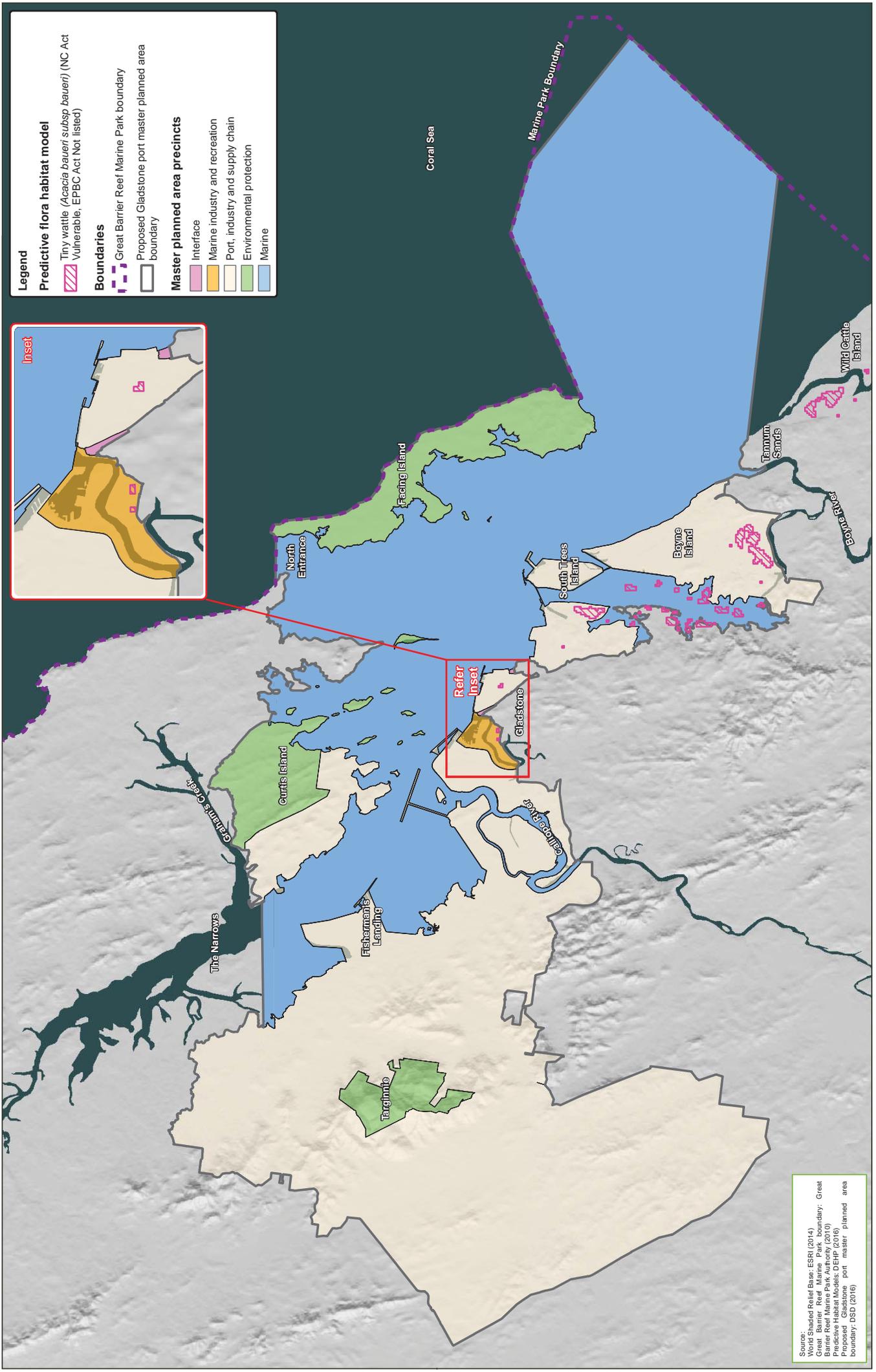


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 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
 Figure B.25: Predictive fauna habitat model - Rusty monitor (*Varanus semiremex*) developed by the Department of Environment and Heritage Protection

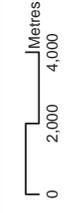


Gladstone port master planning risk assessment
Figure B.26: Predictive flora habitat model - Whipstick wattle (*Acacia attenuata*)
 developed by the Department of Environment and Heritage Protection

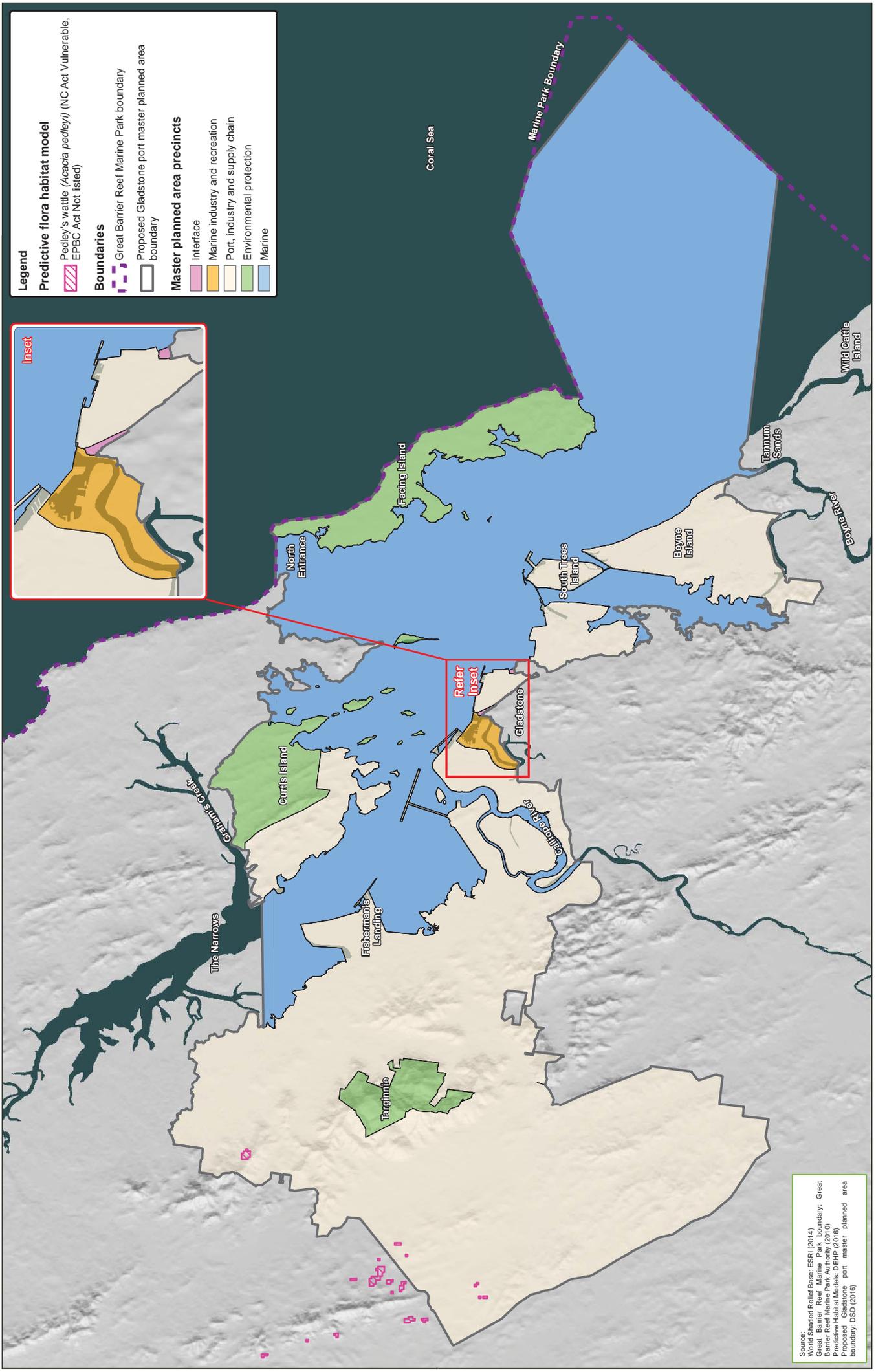


Gladstone port master planning risk assessment
 Figure B.27: Predictive flora habitat model - Tiny wattle (*Acacia baueri subsp baueri*) developed by the Department of Environment and Heritage Protection

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: Aurecon (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

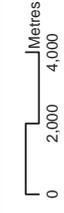


Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56



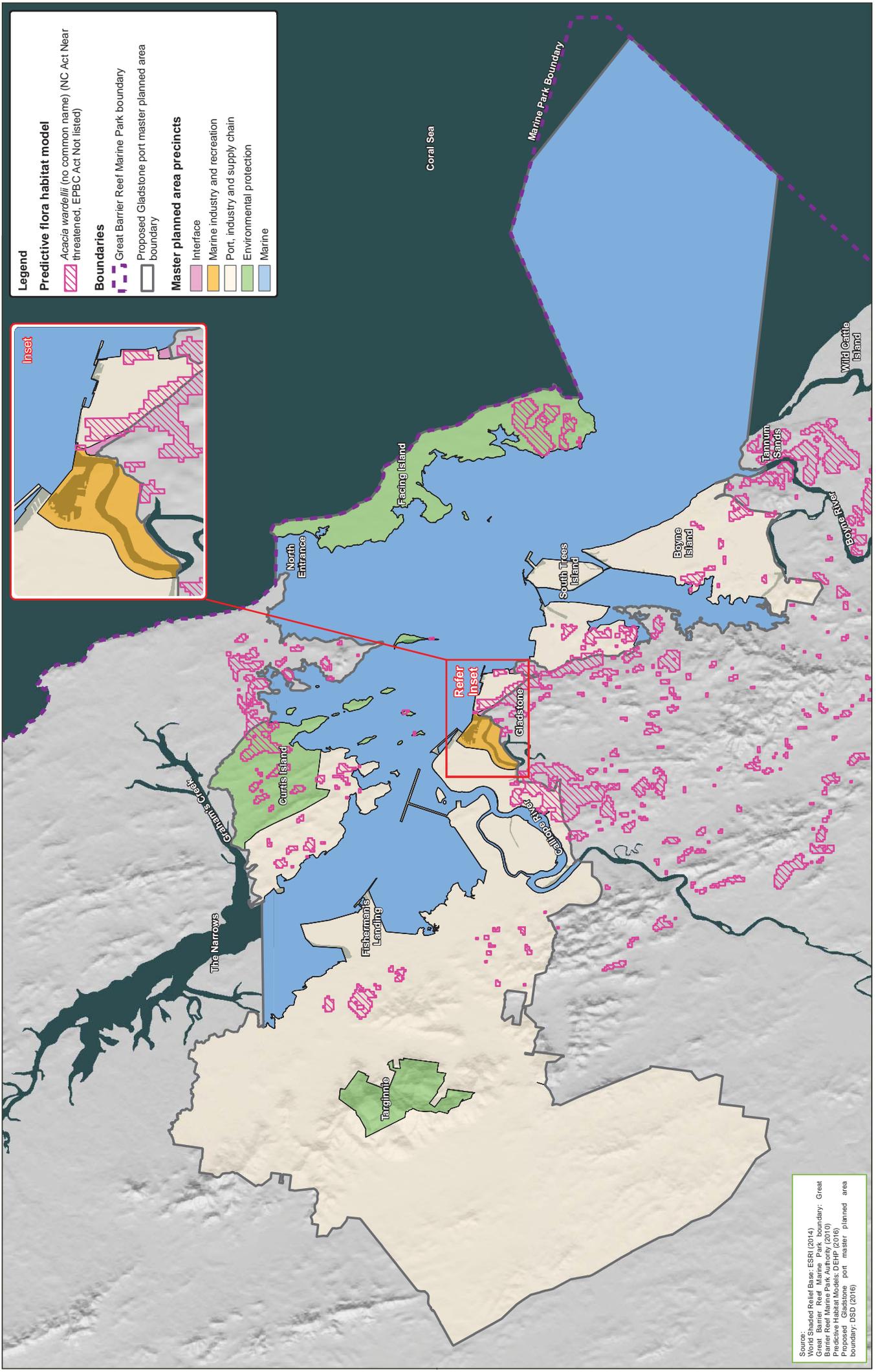
Gladstone port master planning risk assessment
Figure B.29: Predictive flora habitat model - Pedley's wattle (Acacia pedleyi)
 developed by the Department of Environment and Heritage Protection

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

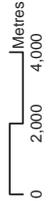


Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56



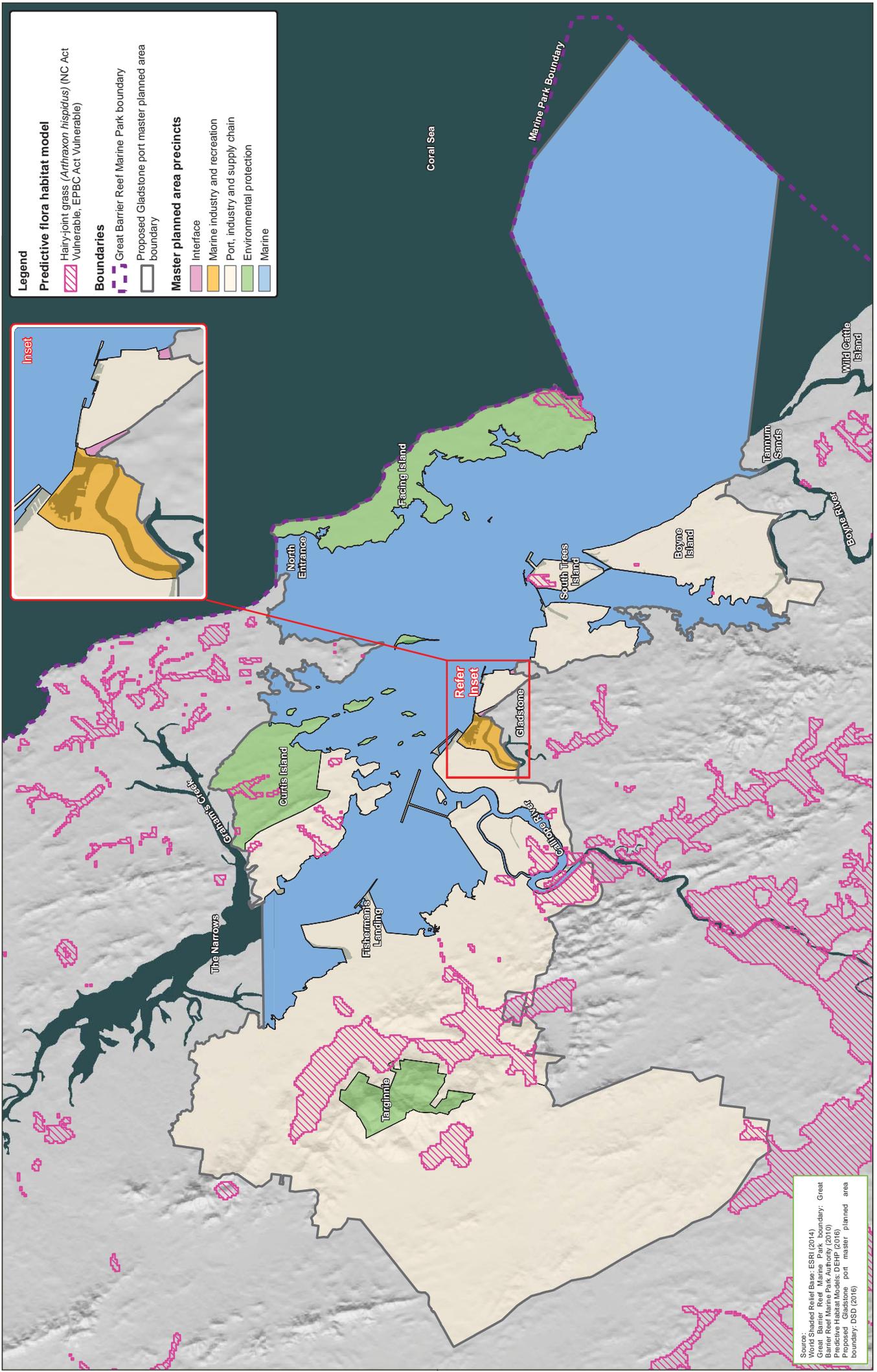


Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: Aurecon (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.30: Predictive flora habitat model - *Acacia wardleii*
 developed by the Department of Environment and Heritage Protection



Legend

Predictive flora habitat model

- Hairy-joint grass (*Arthraxon hispidus*) (NC Act Vulnerable, EPBC Act Vulnerable)

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

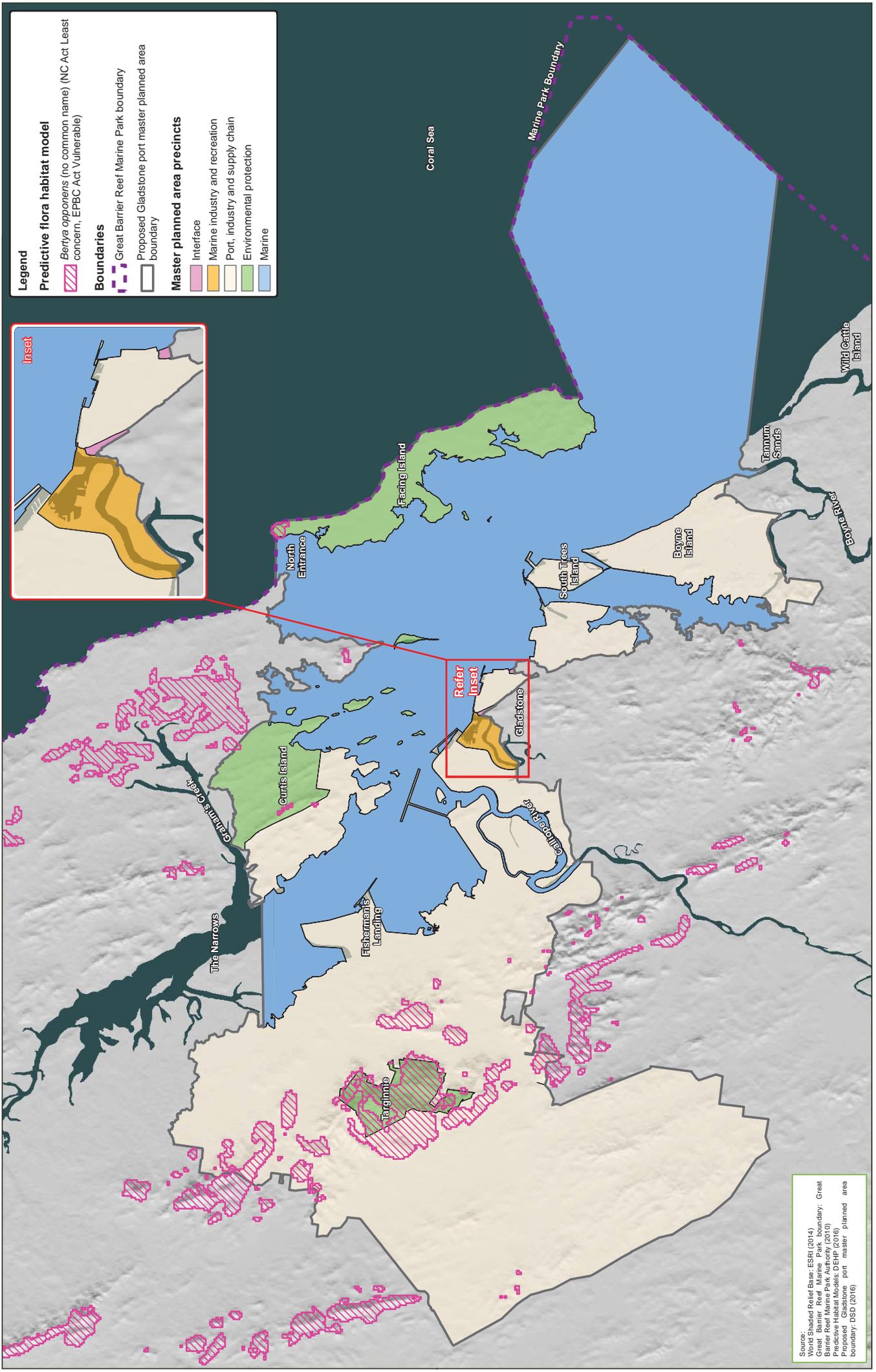
Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

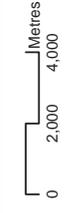


Gladstone port master planning risk assessment
Figure B.31: Predictive flora habitat model - Hairy-joint grass (*Arthraxon hispidus*)
 developed by the Department of Environment and Heritage Protection

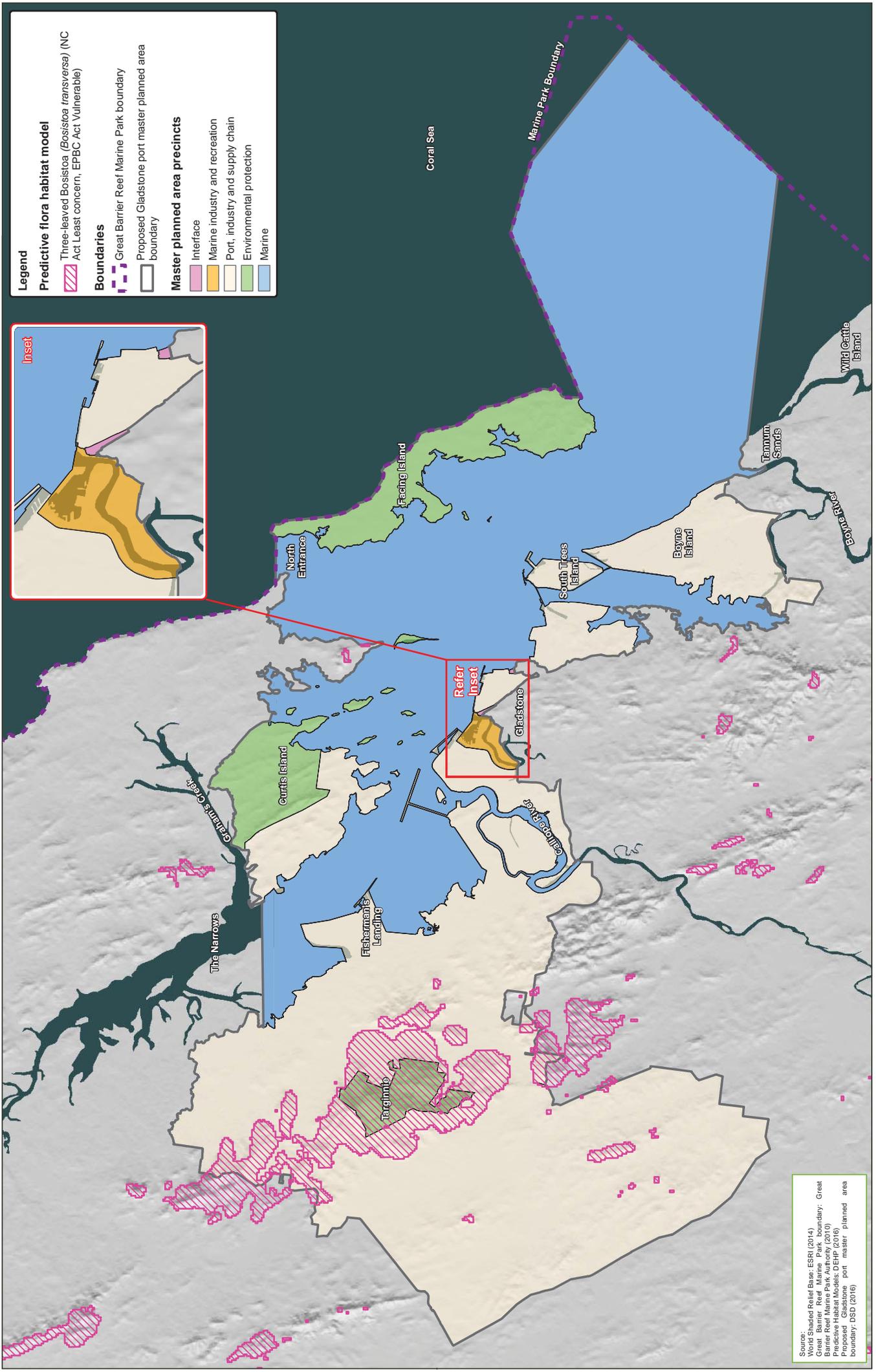


Gladstone port master planning risk assessment
Figure B.32: Predictive flora habitat model - Bertya oppositifolia
 developed by the Department of Environment and Heritage Protection

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

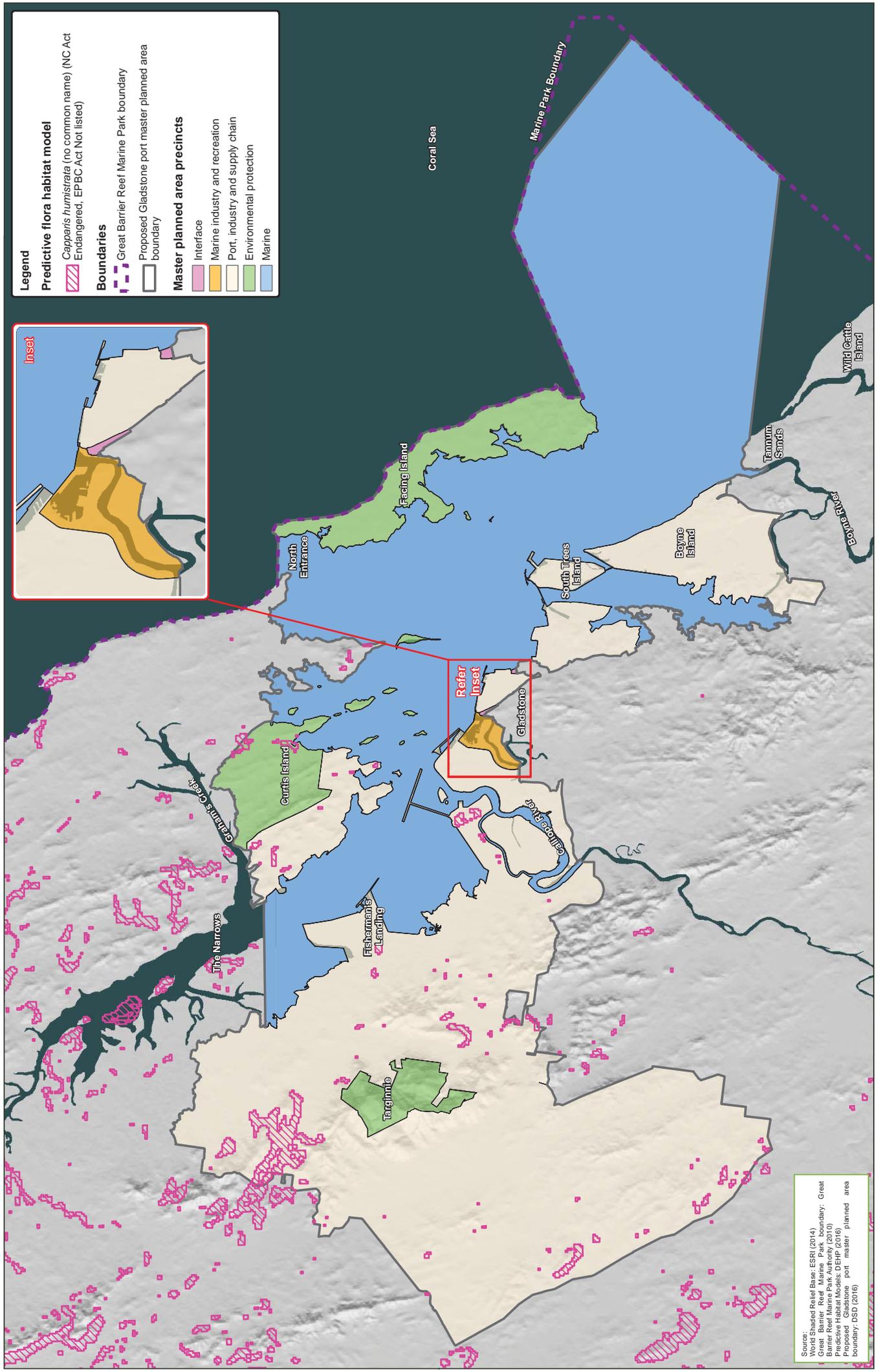


Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56



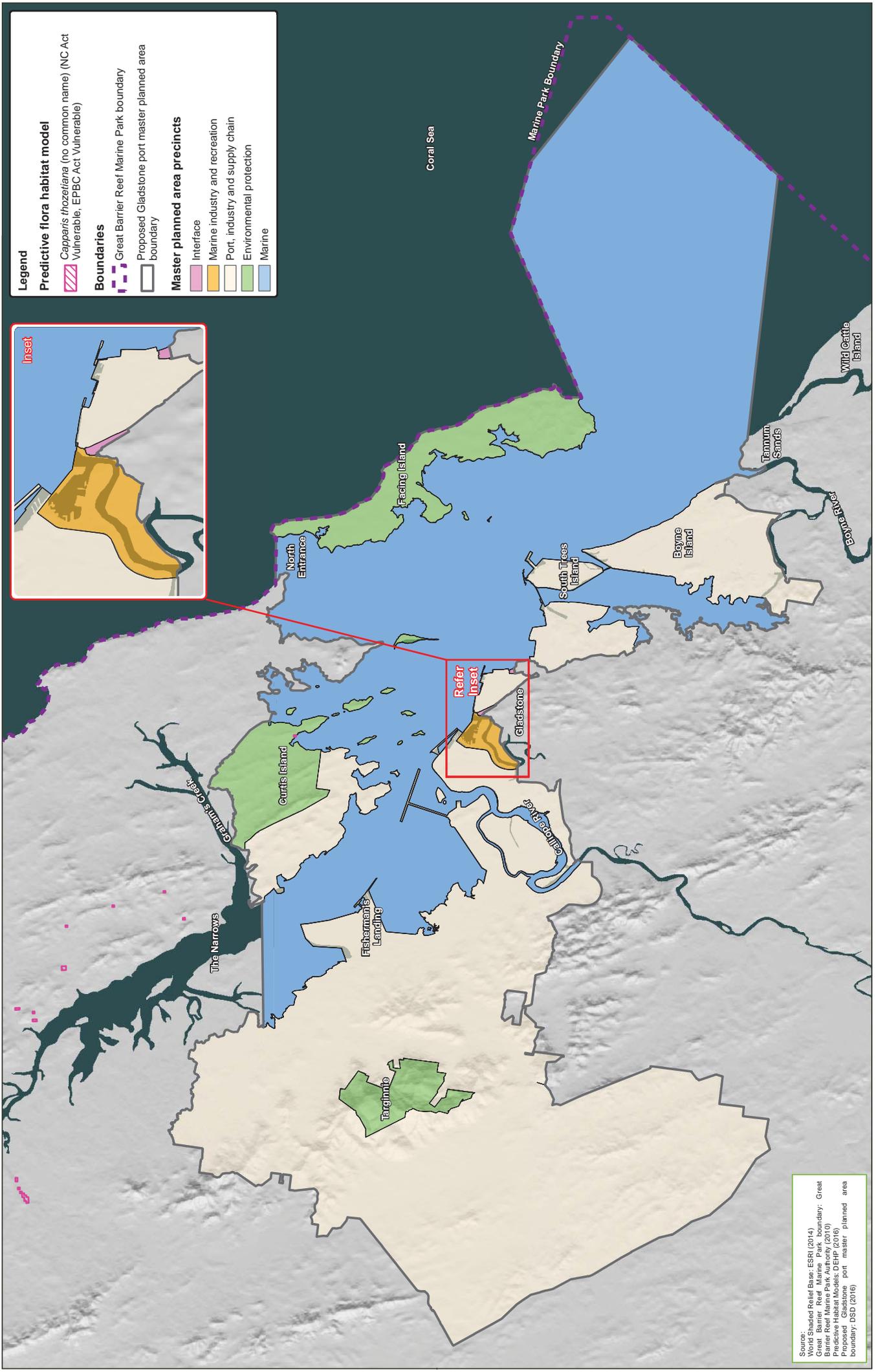
Gladstone port master planning risk assessment
Figure B.33: Predictive flora habitat model - Three-leaved *Bosistoa* (*Bosistoa transversa*)
 developed by the Department of Environment and Heritage Protection





Gladstone port master planning risk assessment
Figure B.35: Predictive flora habitat model - *Capparid humistrata*
 developed by the Department of Environment and Heritage Protection





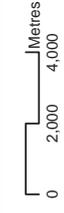
Legend

Predictive flora habitat model
Capparis thozetiana (no common name) (NC Act Vulnerable, EPBC Act Vulnerable)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

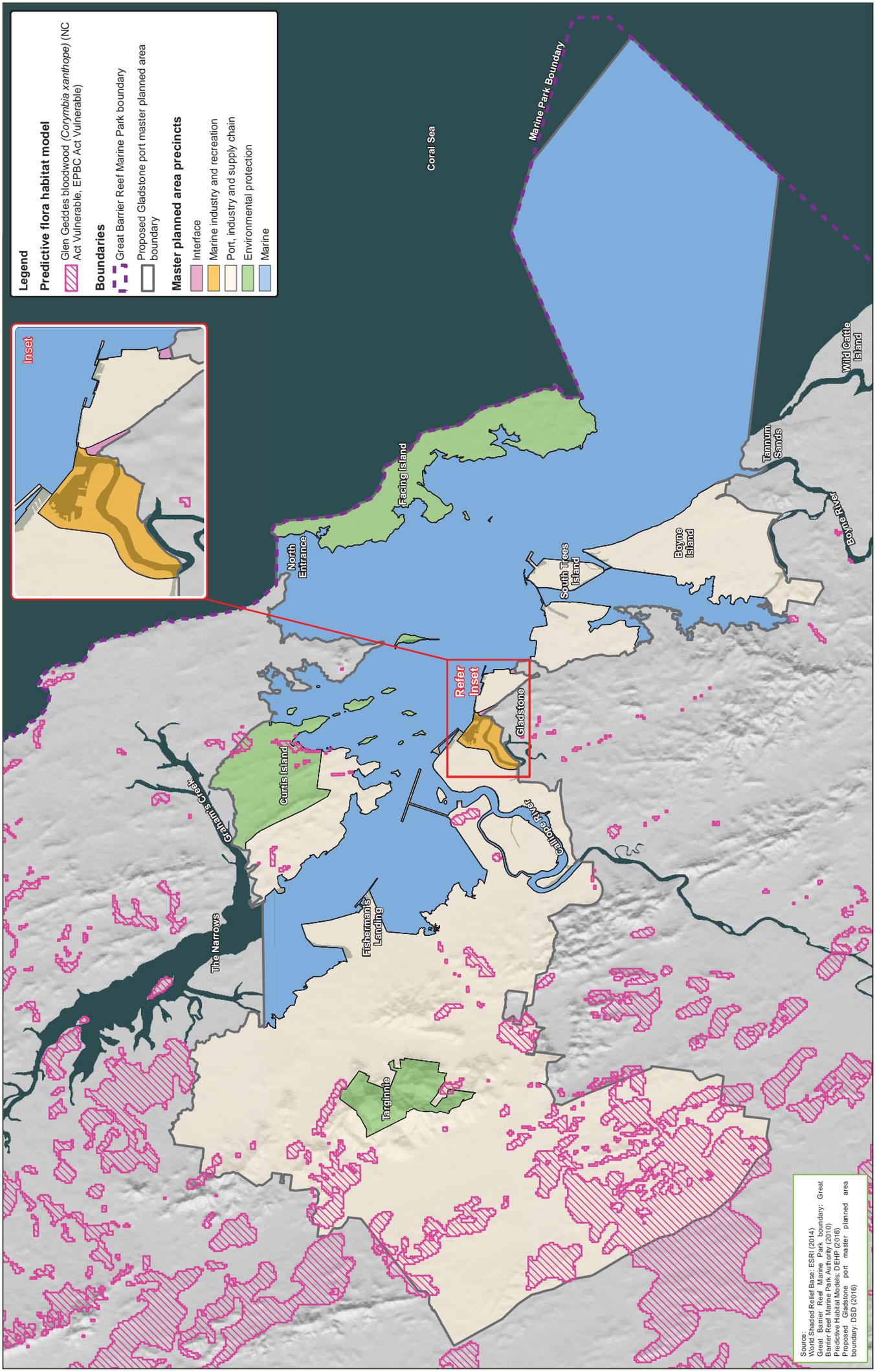
Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: Aurecon (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
 Figure B.36: Predictive flora habitat model - *Capparis thozetiana* developed by the Department of Environment and Heritage Protection



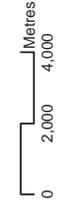
Legend

Predictive flora habitat model
 Glen Geddies bloodwood (*Corymbia xanthope*) (NC Act Vulnerable, EPBC Act Vulnerable)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

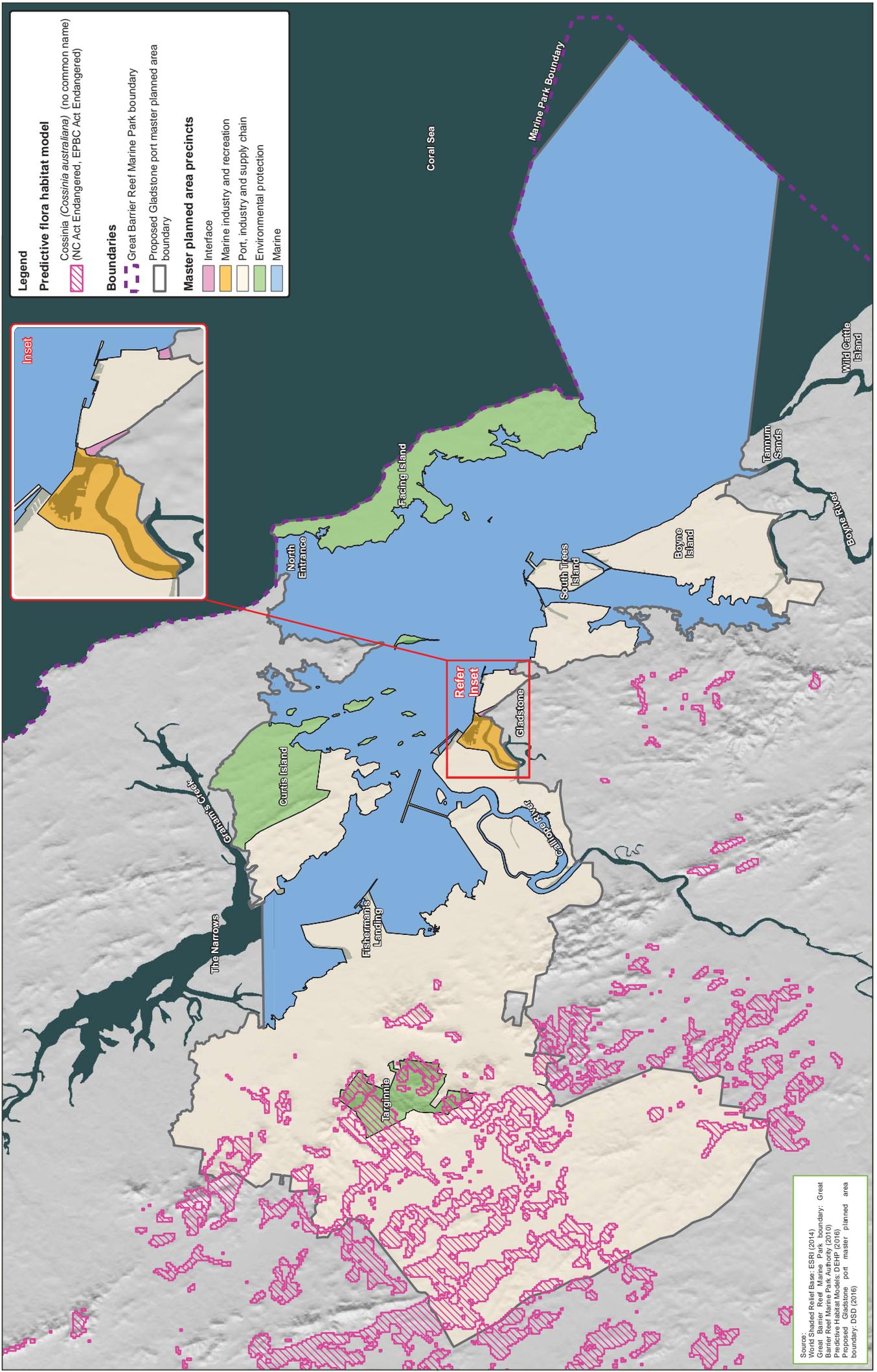
Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56



Gladstone port master planning risk assessment
Figure B.37: Predictive flora habitat model - Glen Geddies bloodwood (*Corymbia xanthope*) developed by the Department of Environment and Heritage Protection



Legend

Predictive flora habitat model
Cossinia (Cossinia australiana) (no common name)
 (NC Act Endangered, EPBC Act Endangered)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

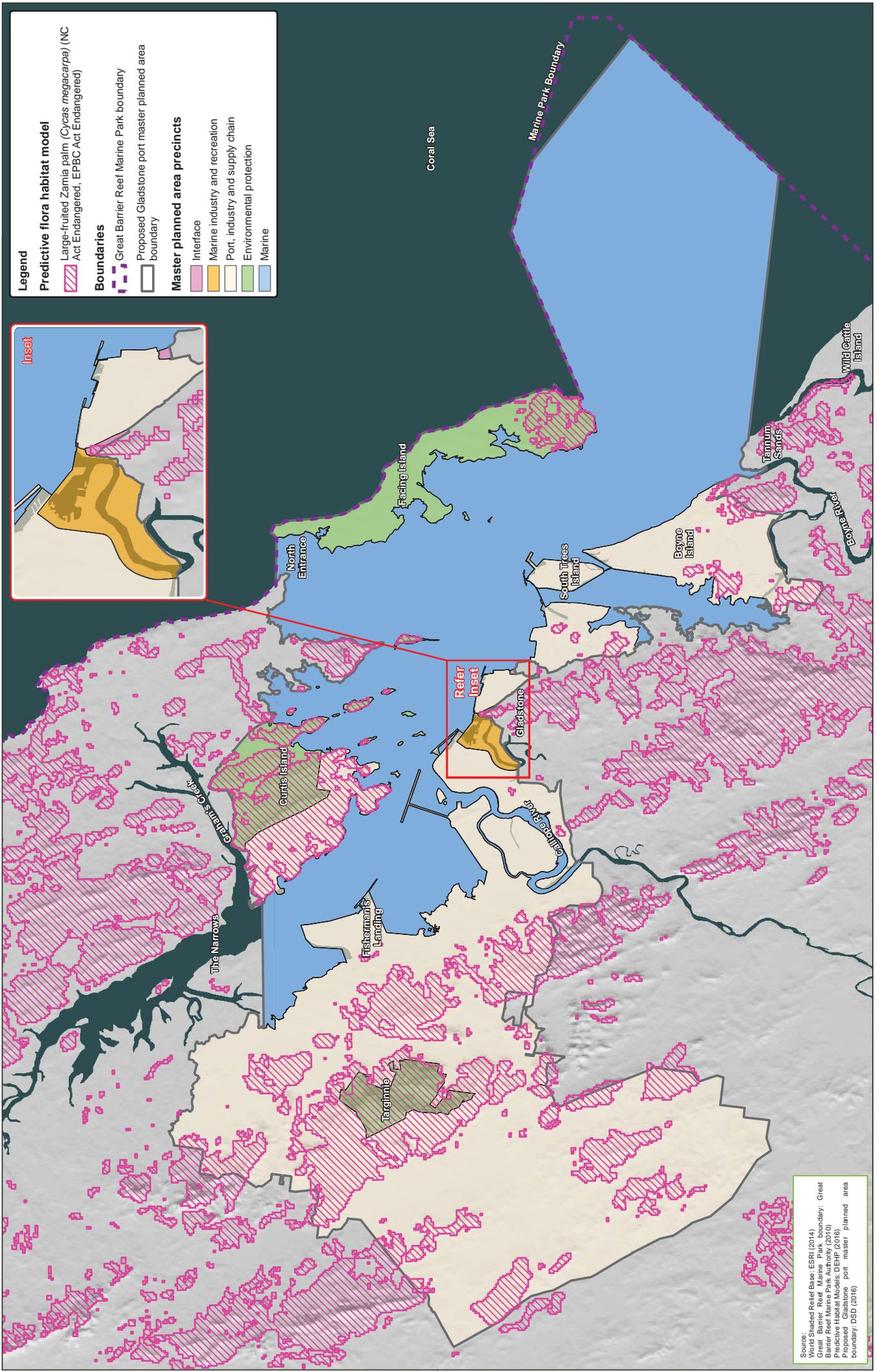
Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
 Figure B.38: Predictive flora habitat model - *Cossinia (Cossinia australiana)*
 developed by the Department of Environment and Heritage Protection



Legend

Predictive flora habitat model
 Large-fruited Zamia palm (*Cycas megacarpa*) (NC Act Endangered, EPBC Act Endangered)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

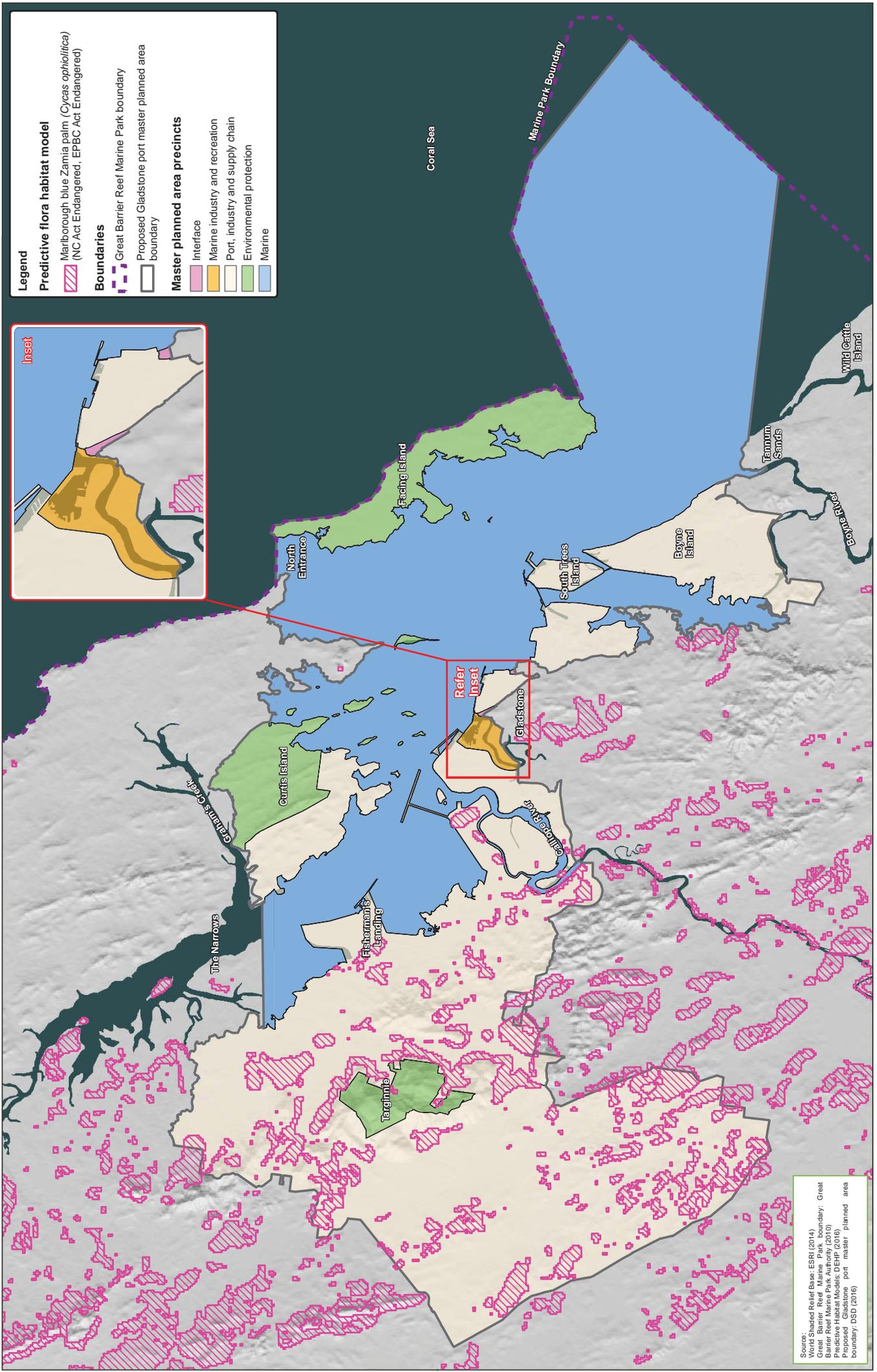
Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.39: Predictive flora habitat model - Large-fruited Zamia palm (*Cycas megacarpa*) developed by the Department of Environment and Heritage Protection

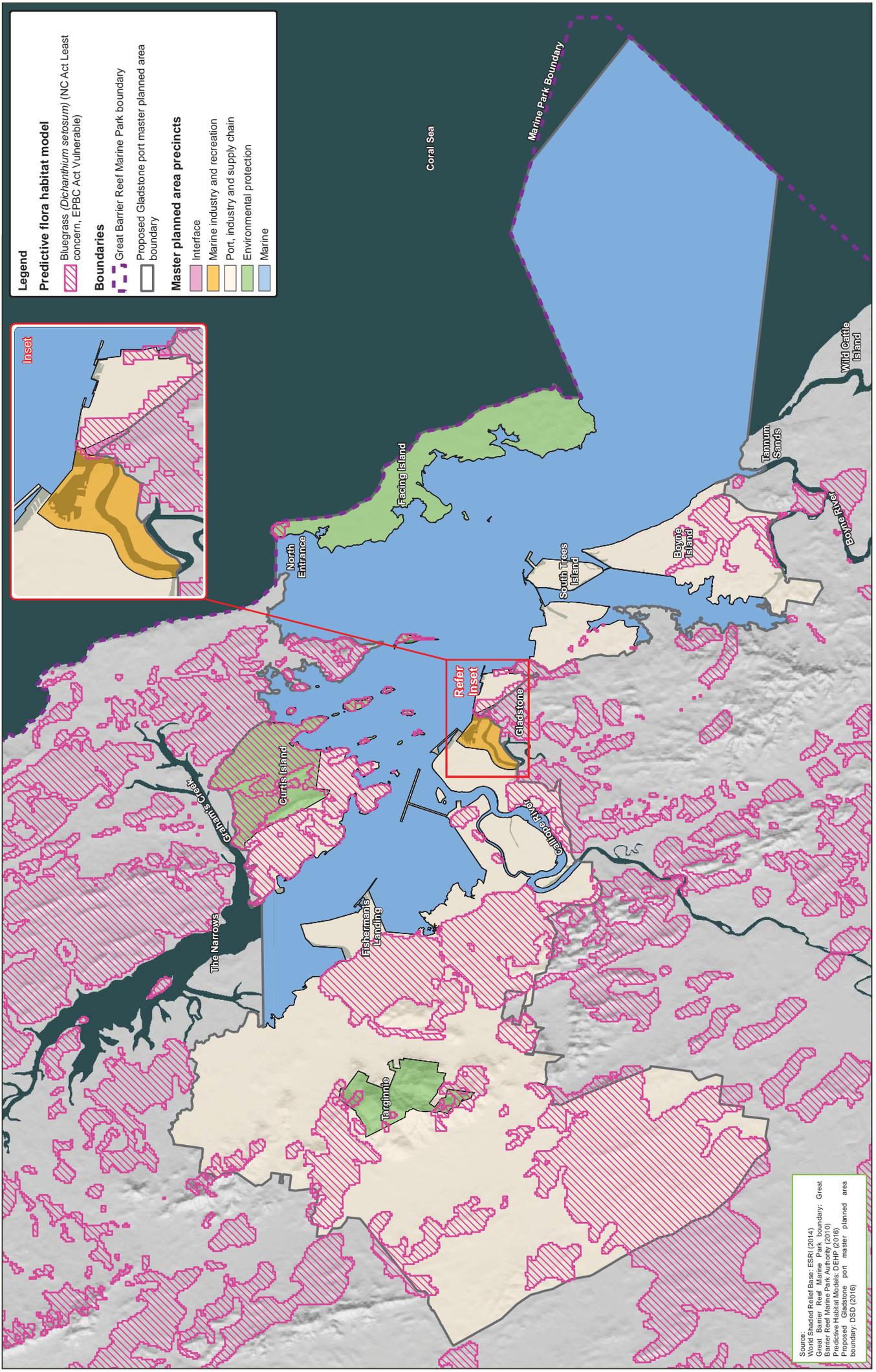


Gladstone port master planning risk assessment
 Figure B.40: Predictive flora habitat model - Mariborough blue Zamia palm (*Cycas ophiolitica*) developed by the Department of Environment and Heritage Protection

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

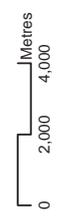
Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56



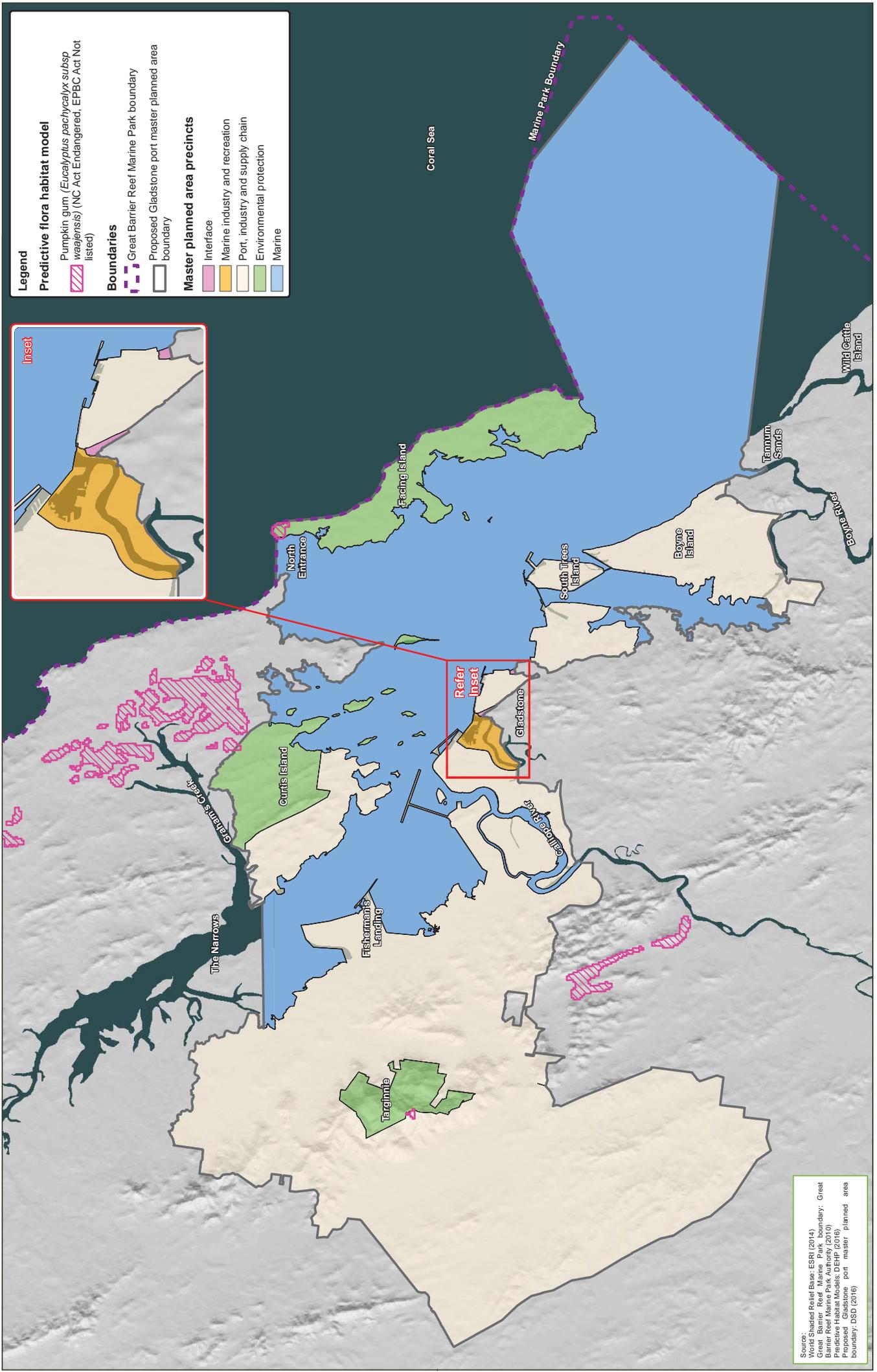


Gladstone port master planning risk assessment
Figure B.41: Predictive flora habitat model - Bluegrass (*Dichanthium setosum*)
 developed by the Department of Environment and Heritage Protection

Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

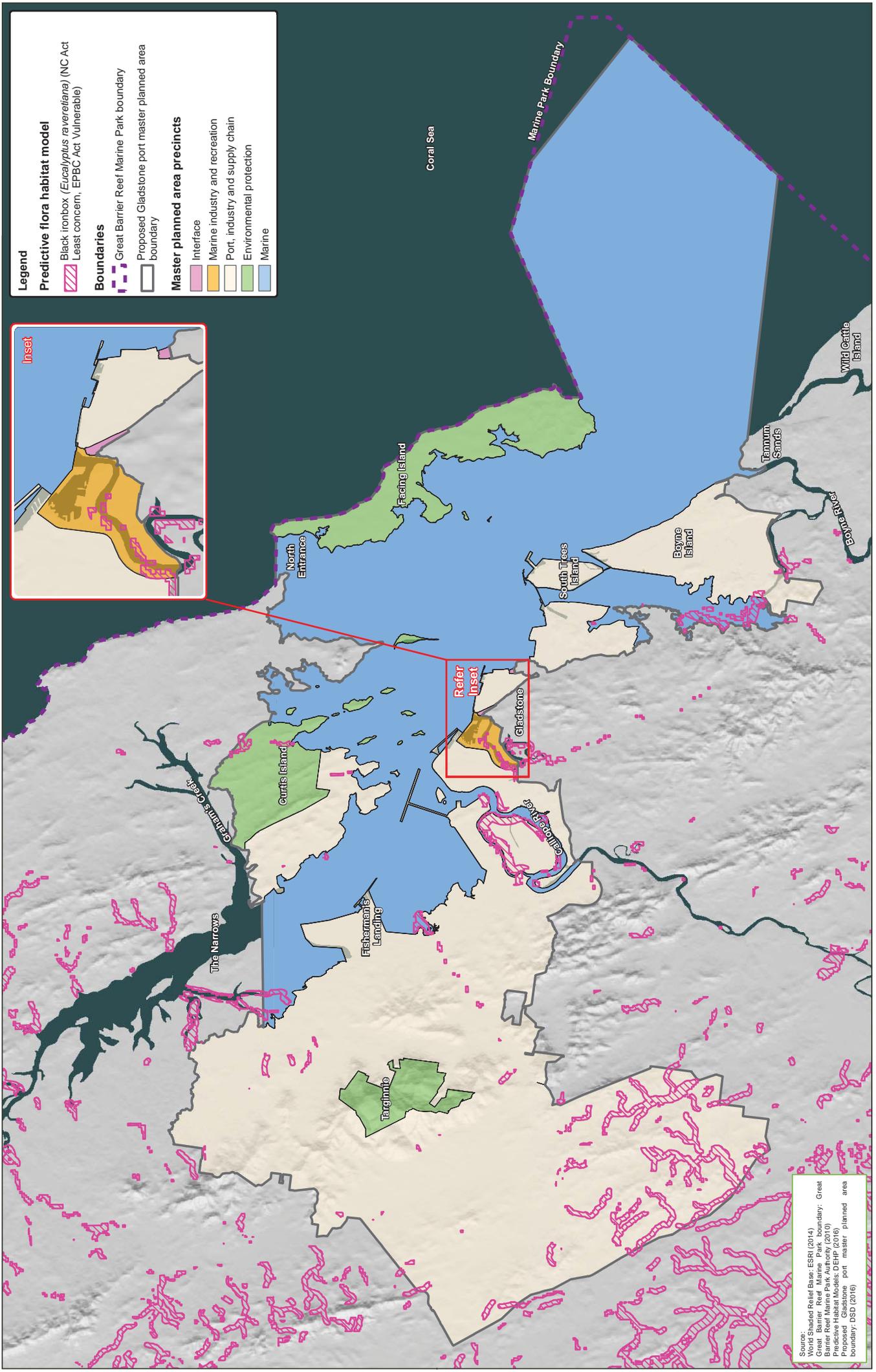


Map by: RB
 Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Gladstone port master planning risk assessment
Figure B.42: Predictive flora habitat model - Pumpkin gum (*Eucalyptus pachycalyx subsp waajensis*)
 developed by the Department of Environment and Heritage Protection





Legend

Predictive flora habitat model

- Black ironbox (*Eucalyptus raверetiana*) (NC Act)
- Least concern, EPBC Act Vulnerable

Boundaries

- Great Barrier Reef Marine Park boundary
- Proposed Gladstone port master planned area boundary

Master planned area precincts

- Interface
- Marine industry and recreation
- Port, industry and supply chain
- Environmental protection
- Marine

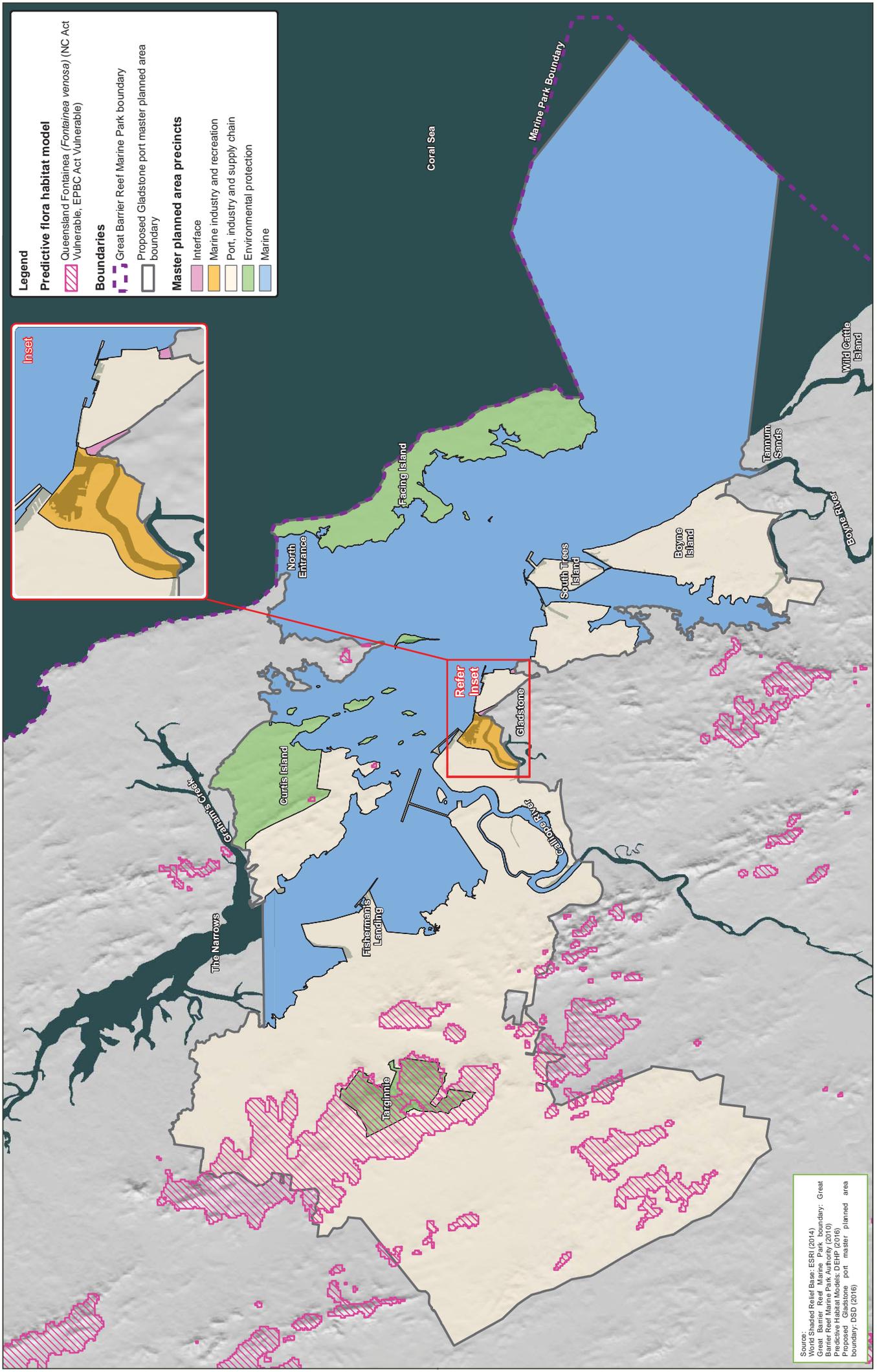
Sources:

- World Shaded Relief Base: ESRI (2014)
- Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
- Marine Park boundary: Queensland Government (2010)
- Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
 Figure B.43: Predictive flora habitat model - Black ironbox (*Eucalyptus raверetiana*) developed by the Department of Environment and Heritage Protection

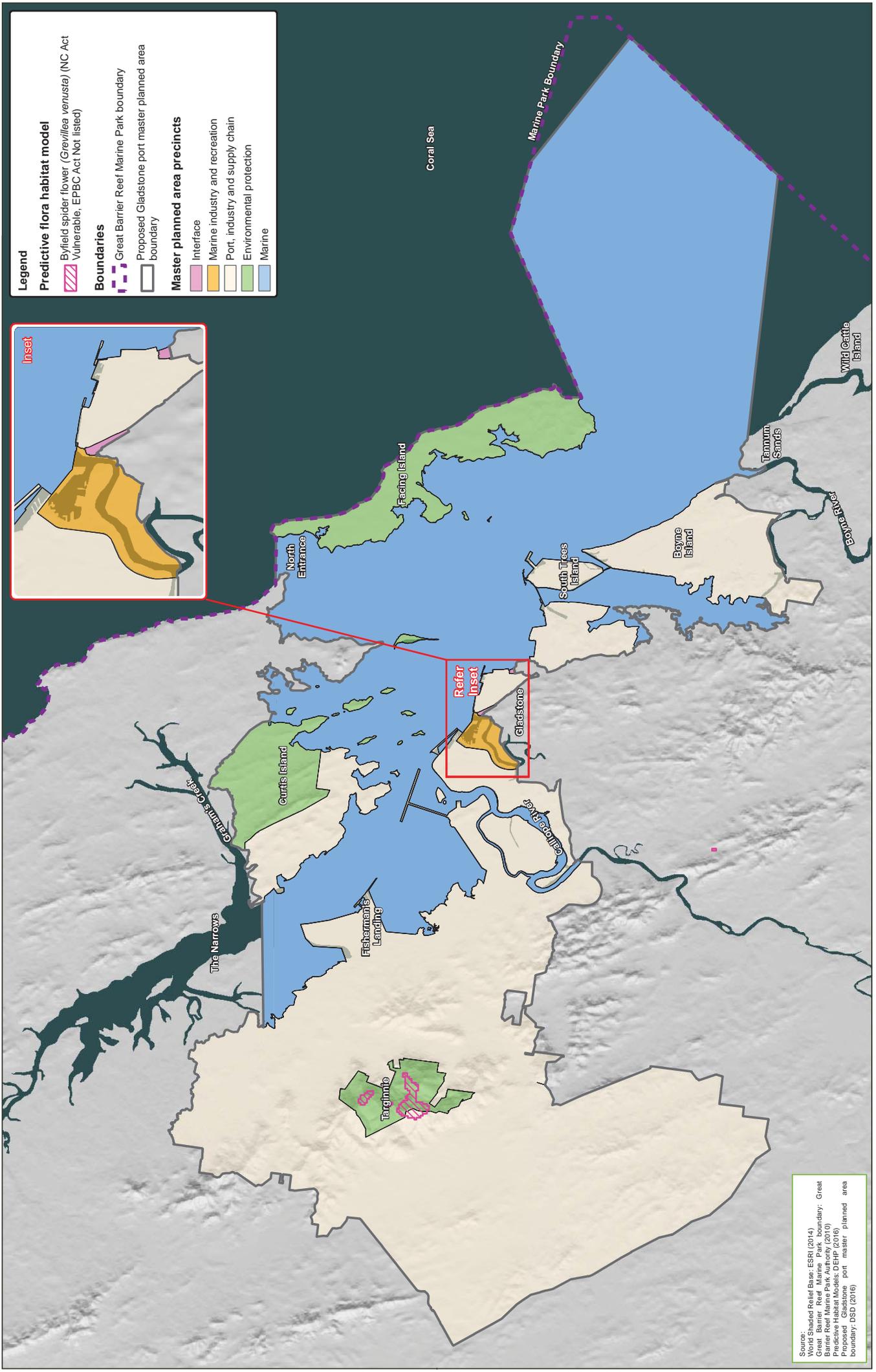


Gladstone port master planning risk assessment
Figure B.44: Predictive flora habitat model - Queen Island Fontainea (Fontainea venosa)
 developed by the Department of Environment and Heritage Protection

Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

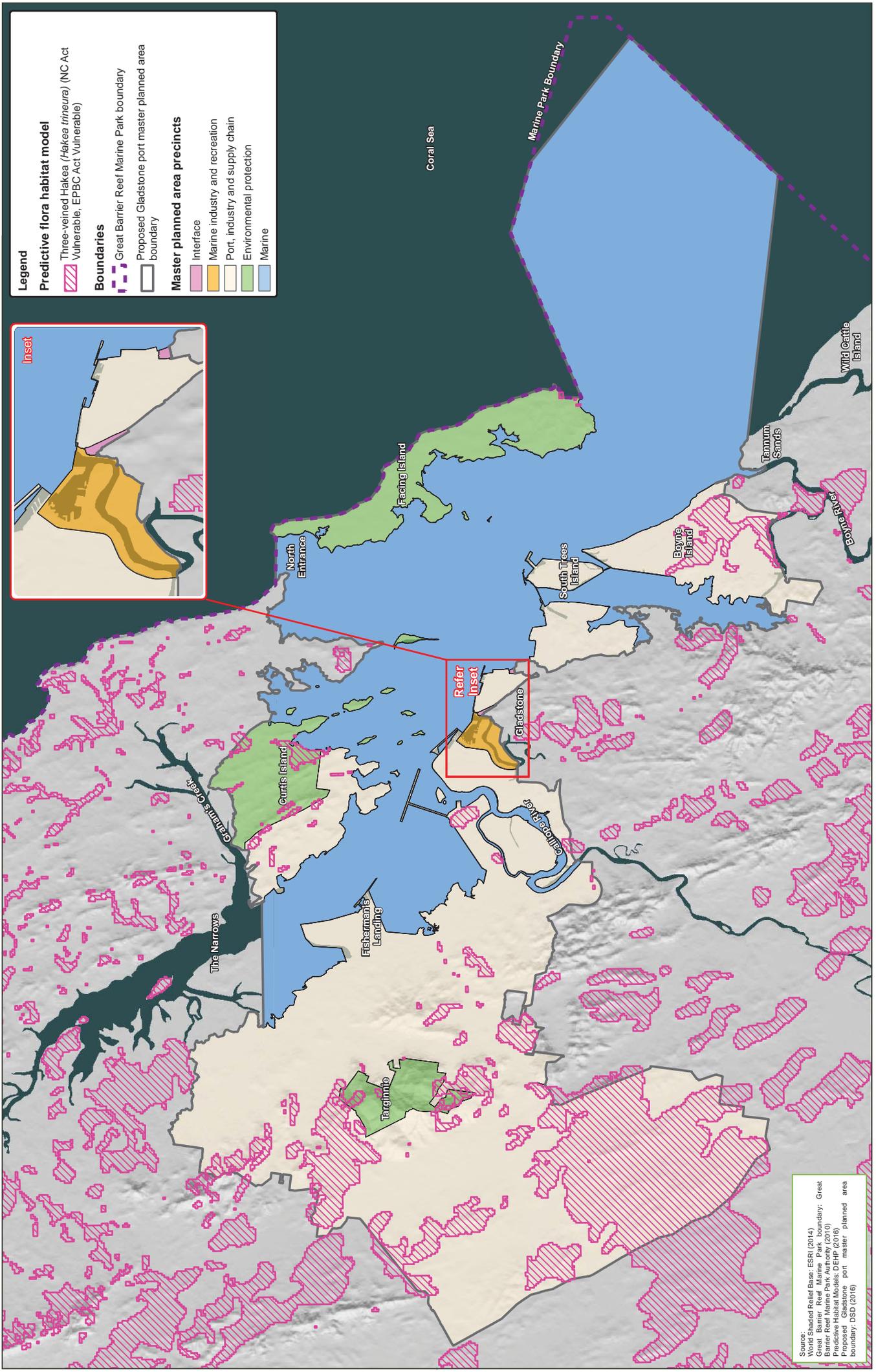


Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Gladstone port master planning risk assessment
Figure B.45: Predictive flora habitat model - Byfield spider flower (*Grevillea venusta*)
 developed by the Department of Environment and Heritage Protection



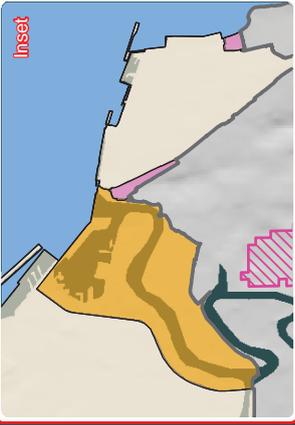


Legend

Predictive flora habitat model
 Three-veined Hakea (*Hakea trineura*) (NC Act Vulnerable, EPBC Act Vulnerable)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine



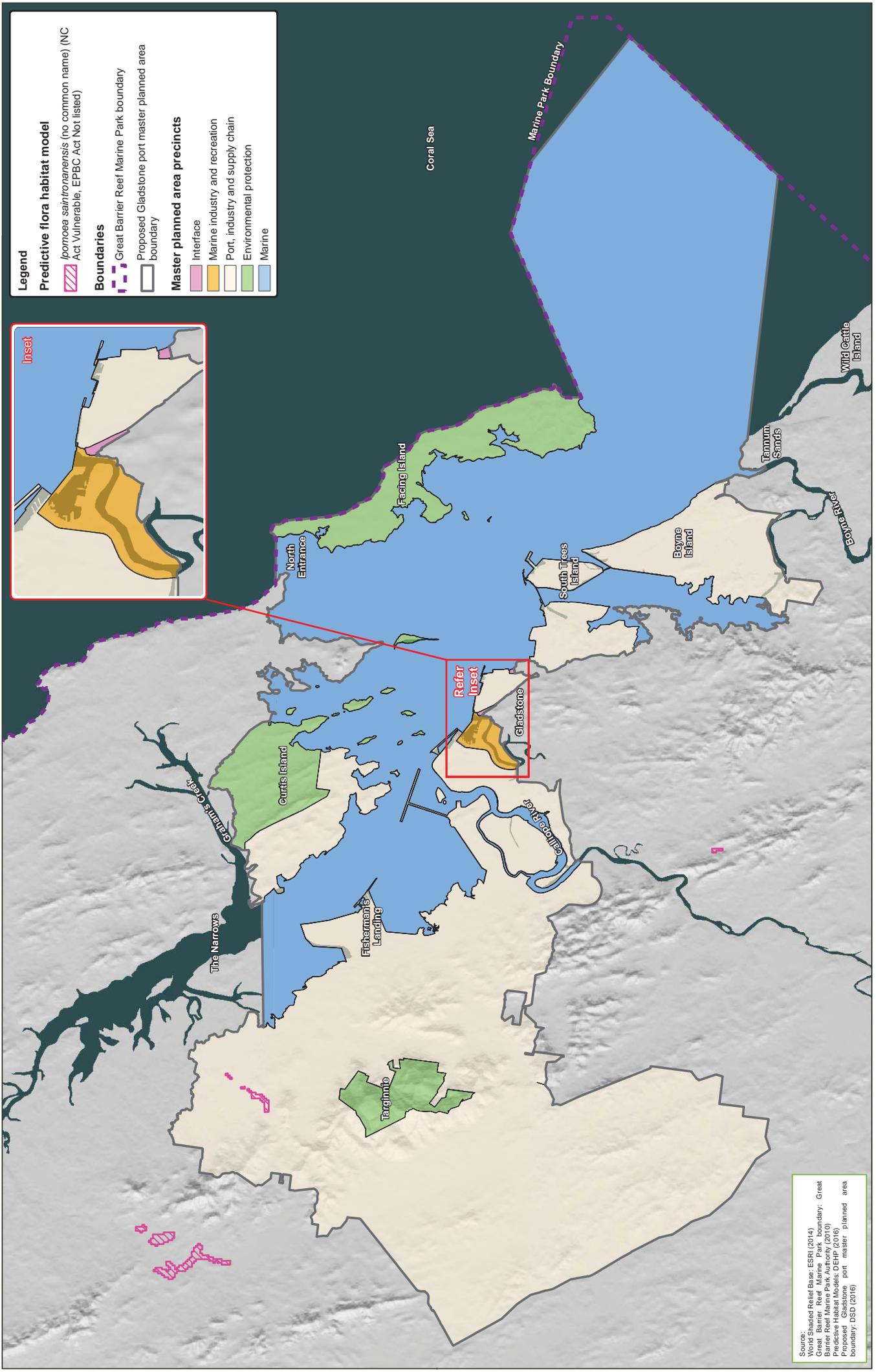
Map by: RB
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Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

0 2,000 4,000 Metres

Gladstone port master planning risk assessment
 Predictive flora habitat model - Three-veined Hakea (*Hakea trineura*)
 developed by the Department of Environment and Heritage Protection

Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56



Legend

Predictive flora habitat model

Ipomoea saintronanensis (no common name) (NC Act Vulnerable, EPBC Act Not listed)

Boundaries

Great Barrier Reef Marine Park boundary
Proposed Gladstone port master planned area boundary

Master planned area precincts

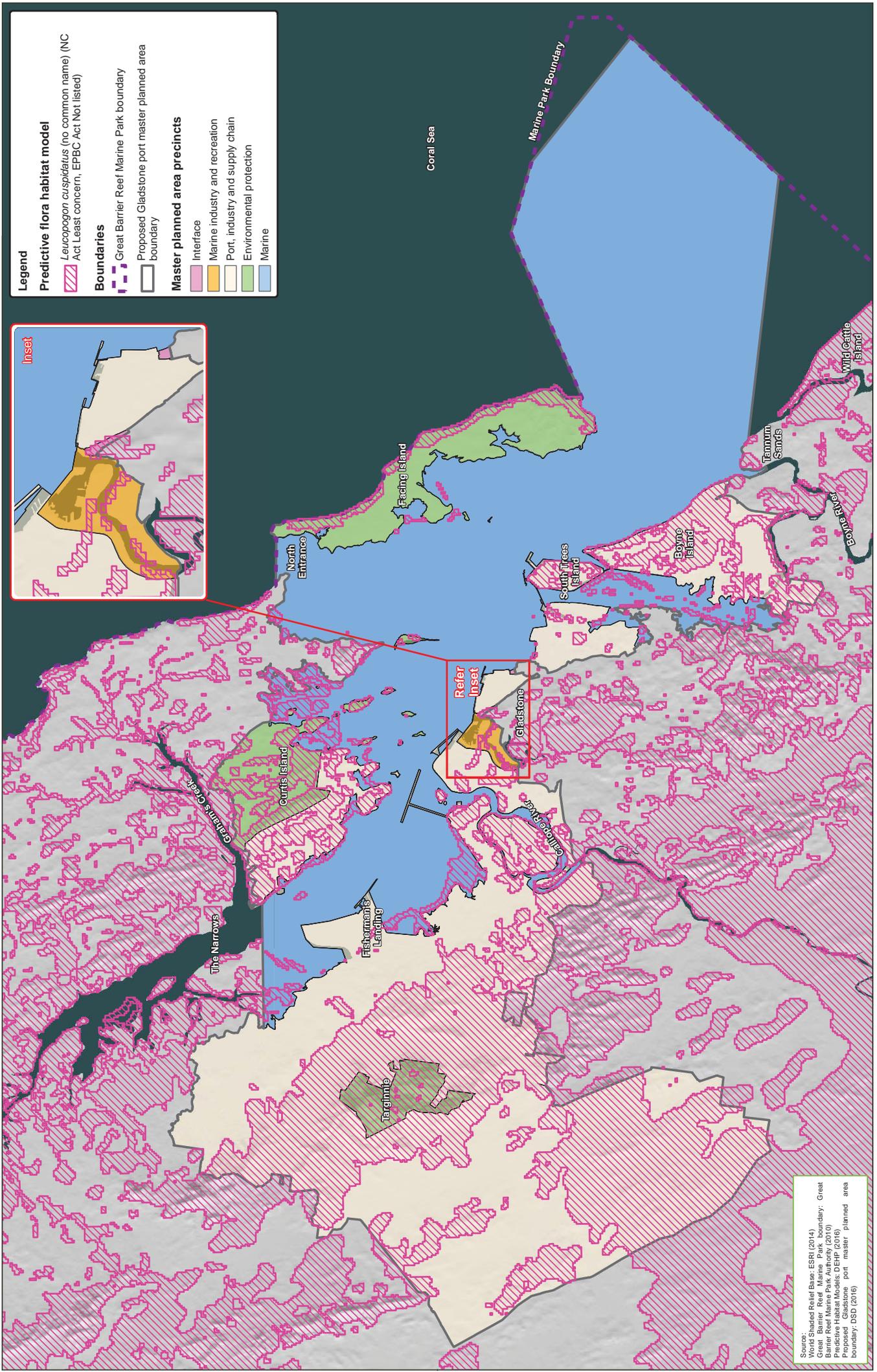
Interface
Marine industry and recreation
Port, industry and supply chain
Environmental protection
Marine

Sources:
World Shaded Relief Base: ESRI (2014)
Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
Predictive Flora Habitat Model: Aurecon (2016)
Proposed Gladstone port master planned area boundary: DSD (2016)

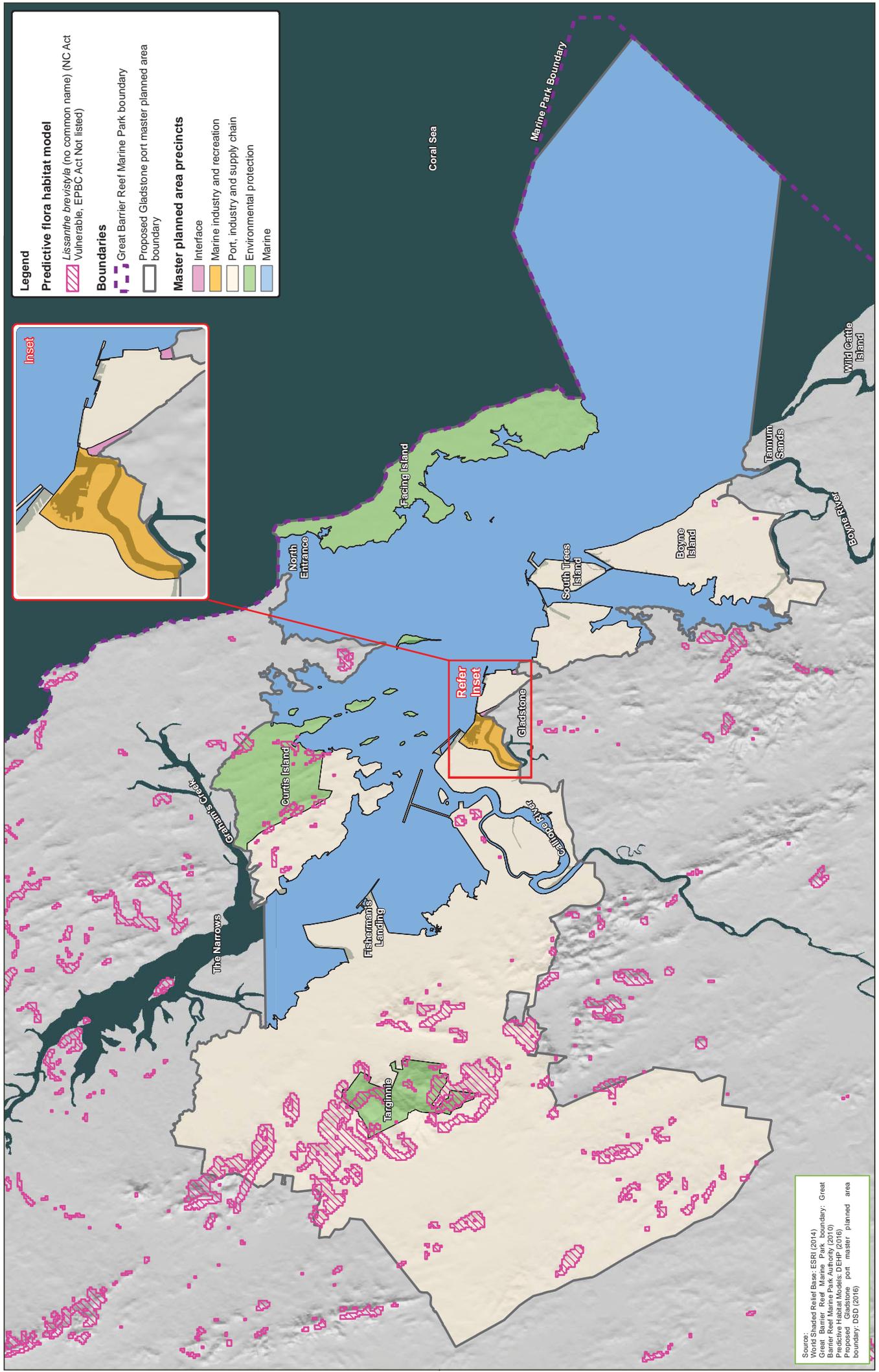


Date: 22/08/2016 Version: 5 Job No: 251469
Coordinate system: GDA 1994 MGA Zone 56

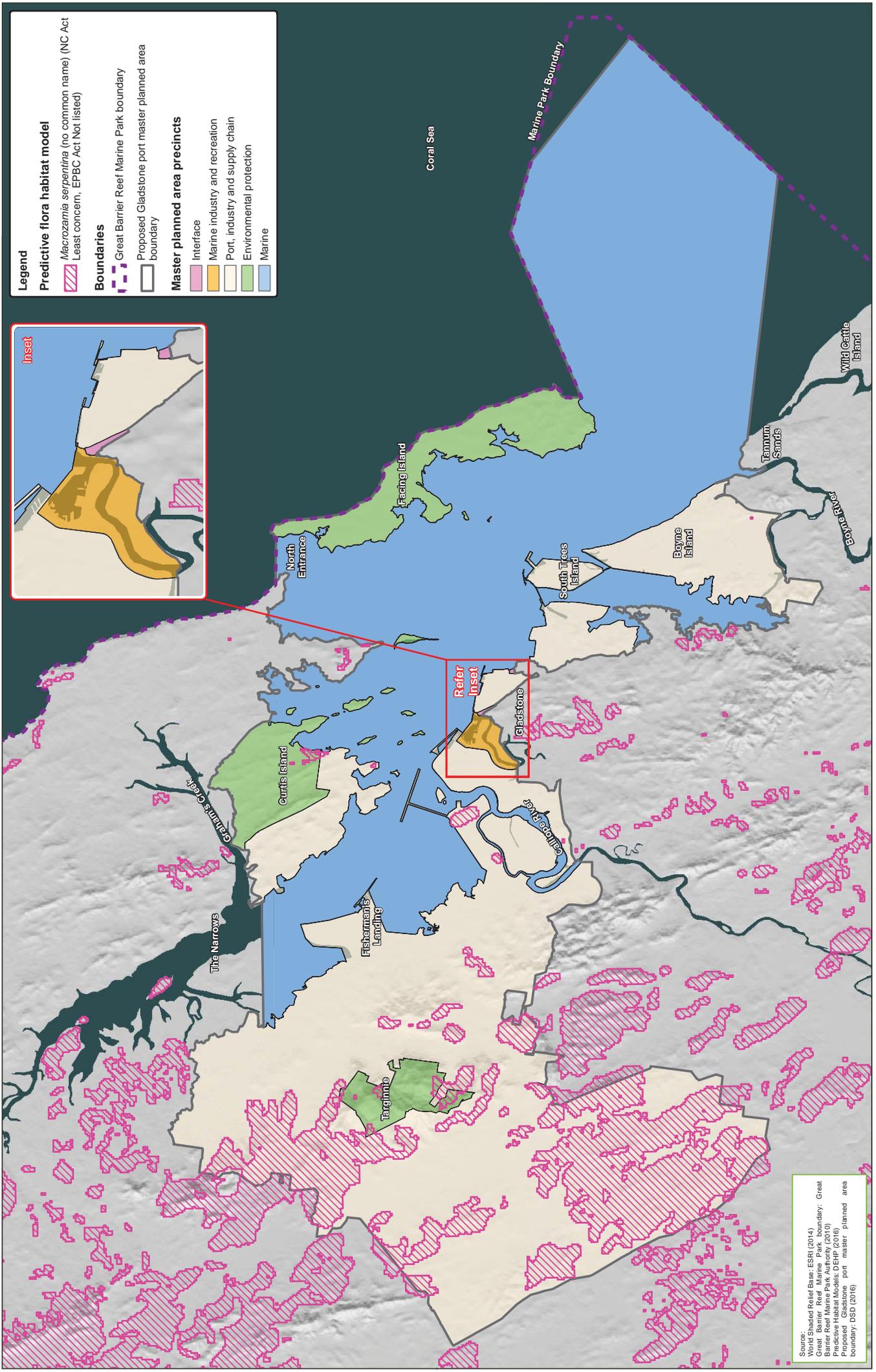
Gladstone port master planning risk assessment
Figure B.47: Predictive flora habitat model - *Ipomoea saintronanensis*
developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
Figure B.48: Predictive flora habitat model - *Leucopogon cuspidatus*
 developed by the Department of Environment and Heritage Protection

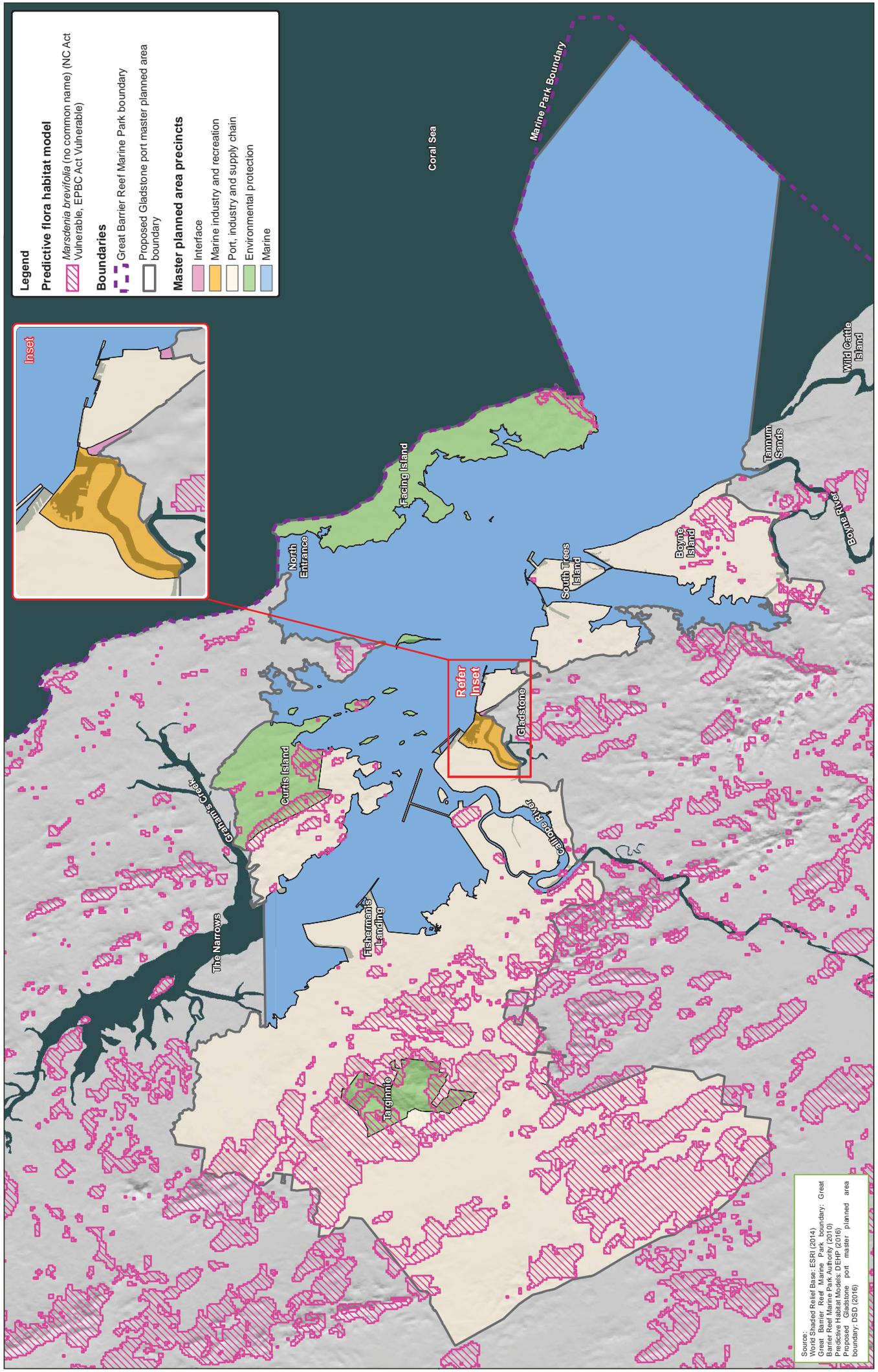


Gladstone port master planning risk assessment
 Figure B.49: Predictive flora habitat model - *Lissarithe brevistylis* developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
Figure B.50: Predictive flora habitat model - *Macrozamia serpentina*
 developed by the Department of Environment and Heritage Protection





Map by: RB
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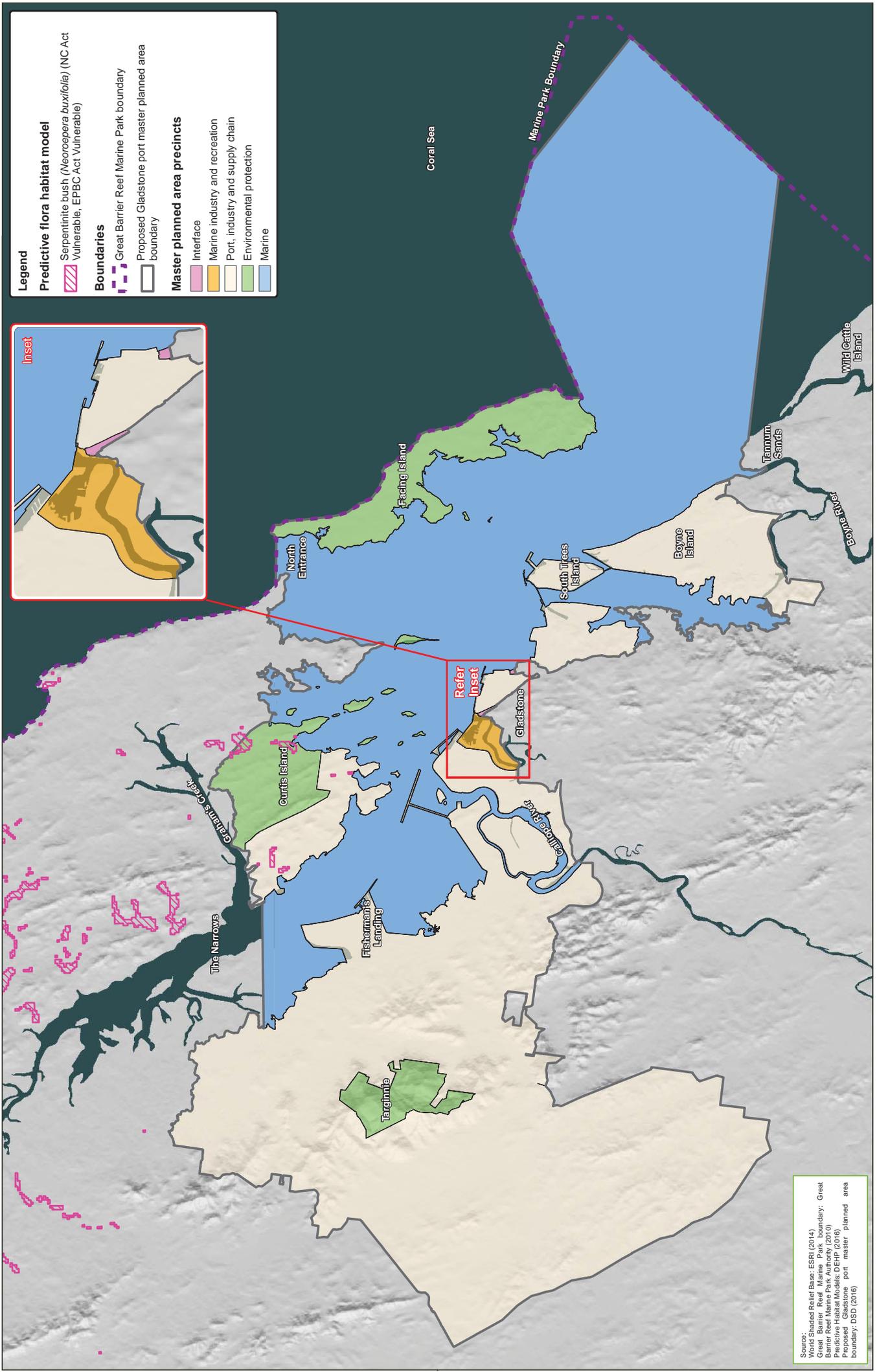
Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

0 2,000 4,000 Metres

Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

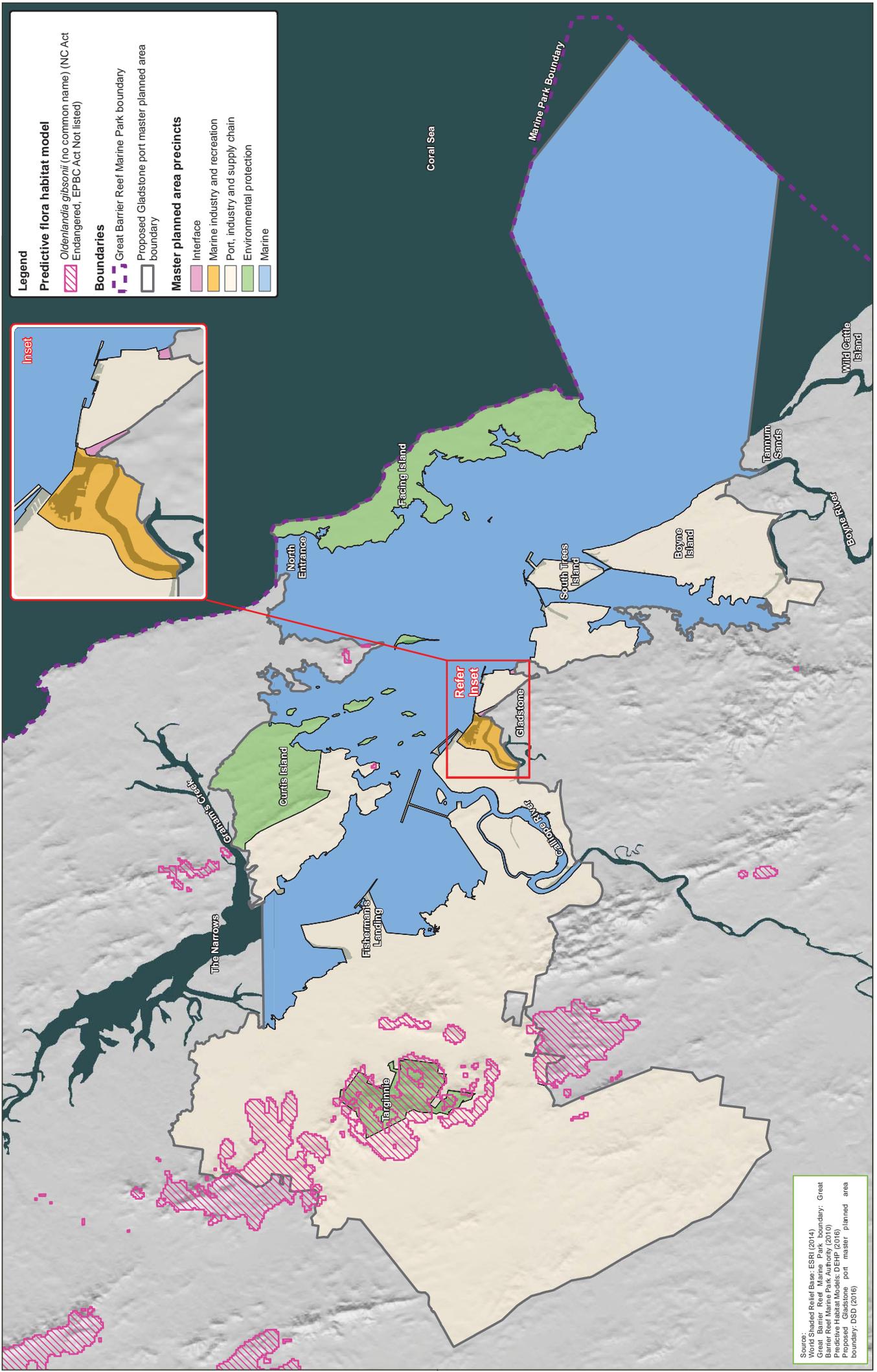
Gladstone port master planning risk assessment

Figure B.51: Predictive flora habitat model - *Marsdenia brevifolia*
 developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
Figure B.52: Predictive flora habitat model - Serpentine bush (*Neoroepera buxifolia*)
 developed by the Department of Environment and Heritage Protection





Gladstone port master planning risk assessment
Figure B.53: Predictive flora habitat model - *Oldenlandia gibsonii*
 developed by the Department of Environment and Heritage Protection

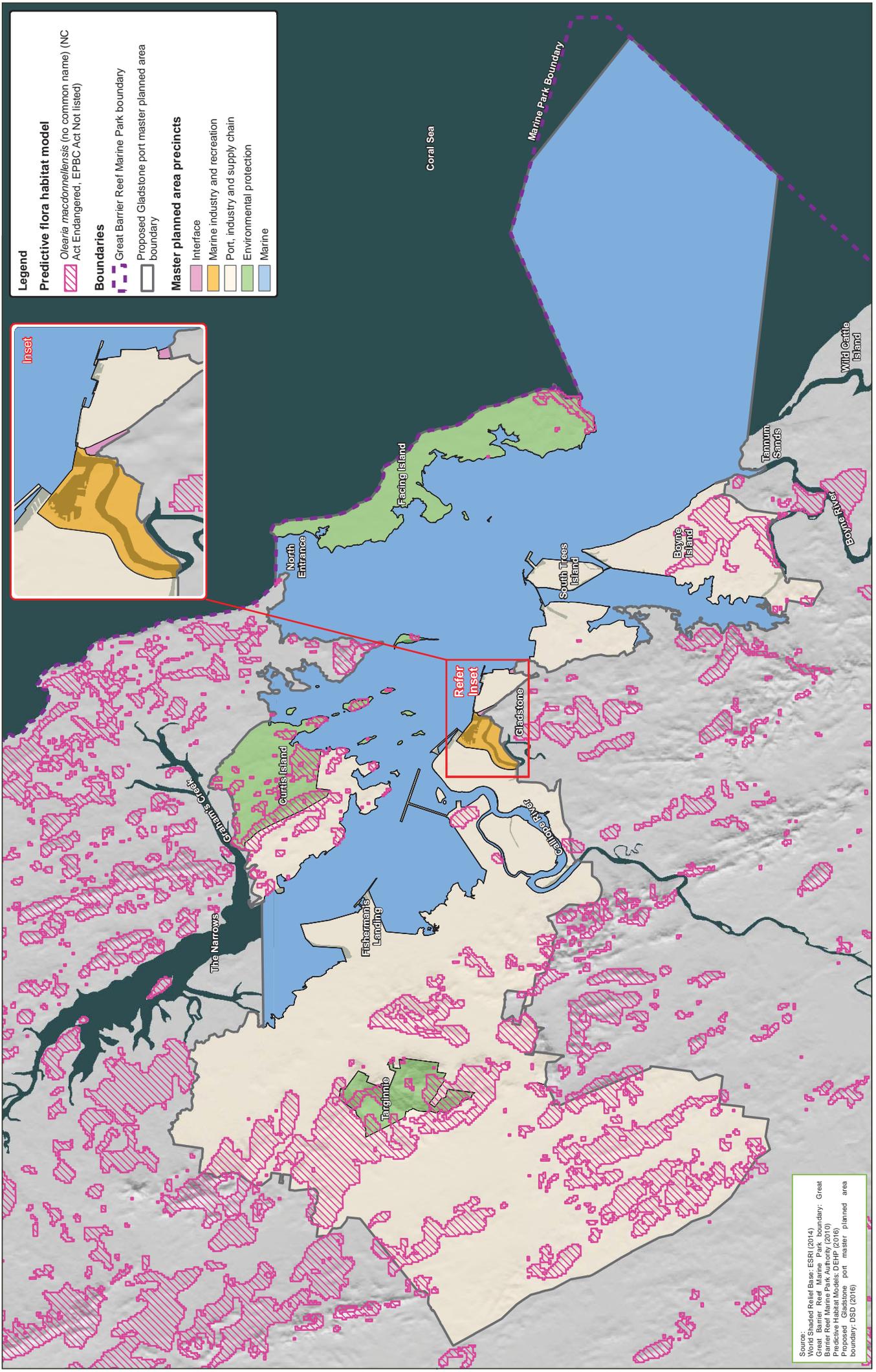
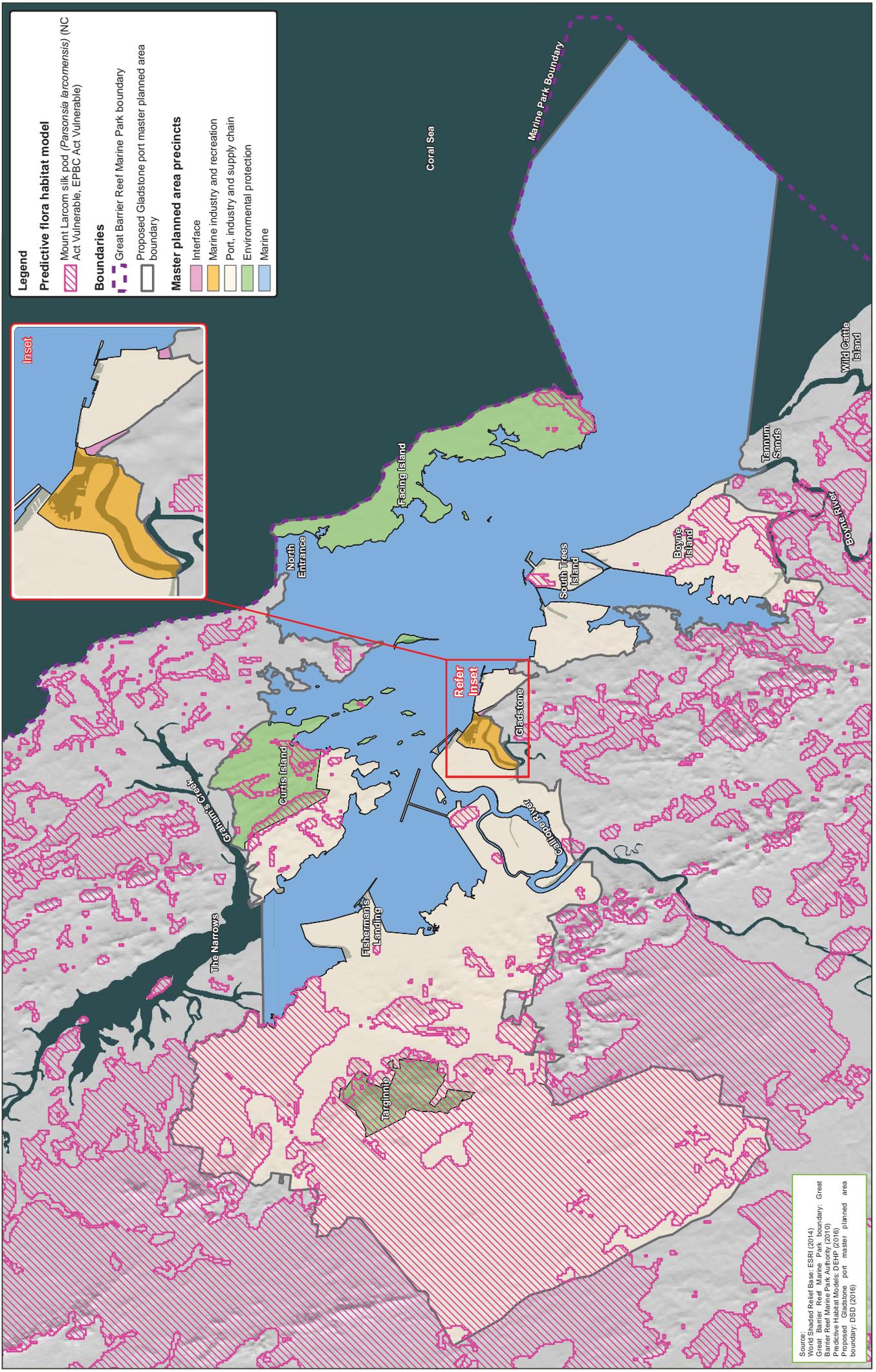


Figure B.54: Predictive flora habitat model - *Olearia maccdonnellensis* developed by the Department of Environment and Heritage Protection

Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56



Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

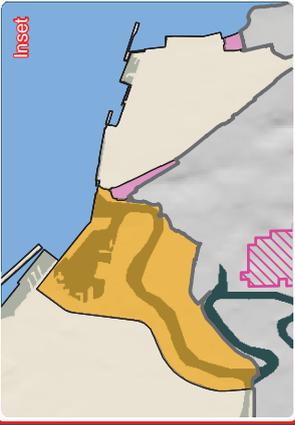


Legend

Predictive flora habitat model
 Mount Larcom silk pod (*Parsonsia larcomensis*) (NC Act Vulnerable, EPBC Act Vulnerable)

Boundaries
 Great Barrier Reef Marine Park boundary
 Proposed Gladstone port master planned area boundary

Master planned area precincts
 Interface
 Marine industry and recreation
 Port, industry and supply chain
 Environmental protection
 Marine

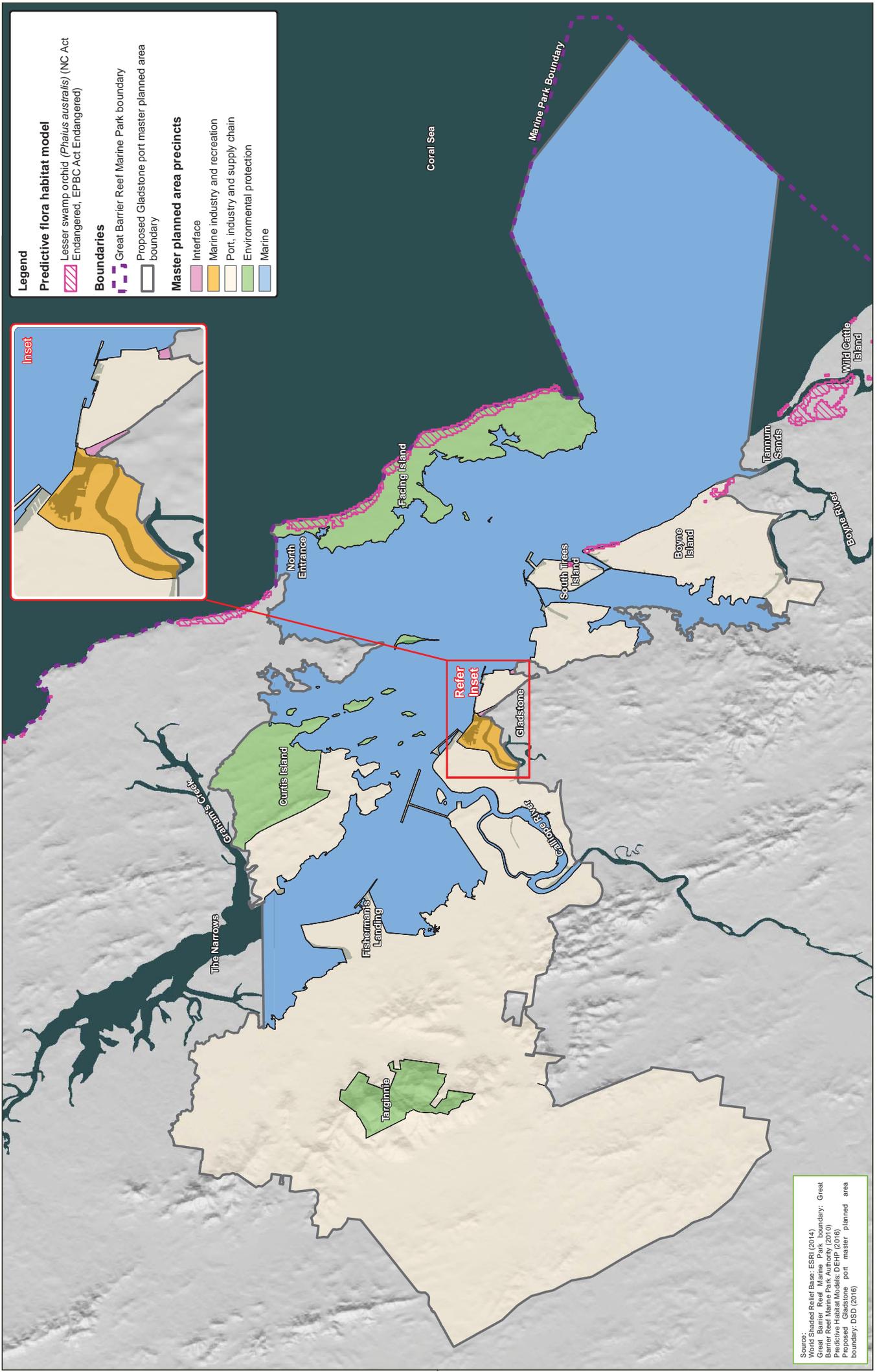


Source:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



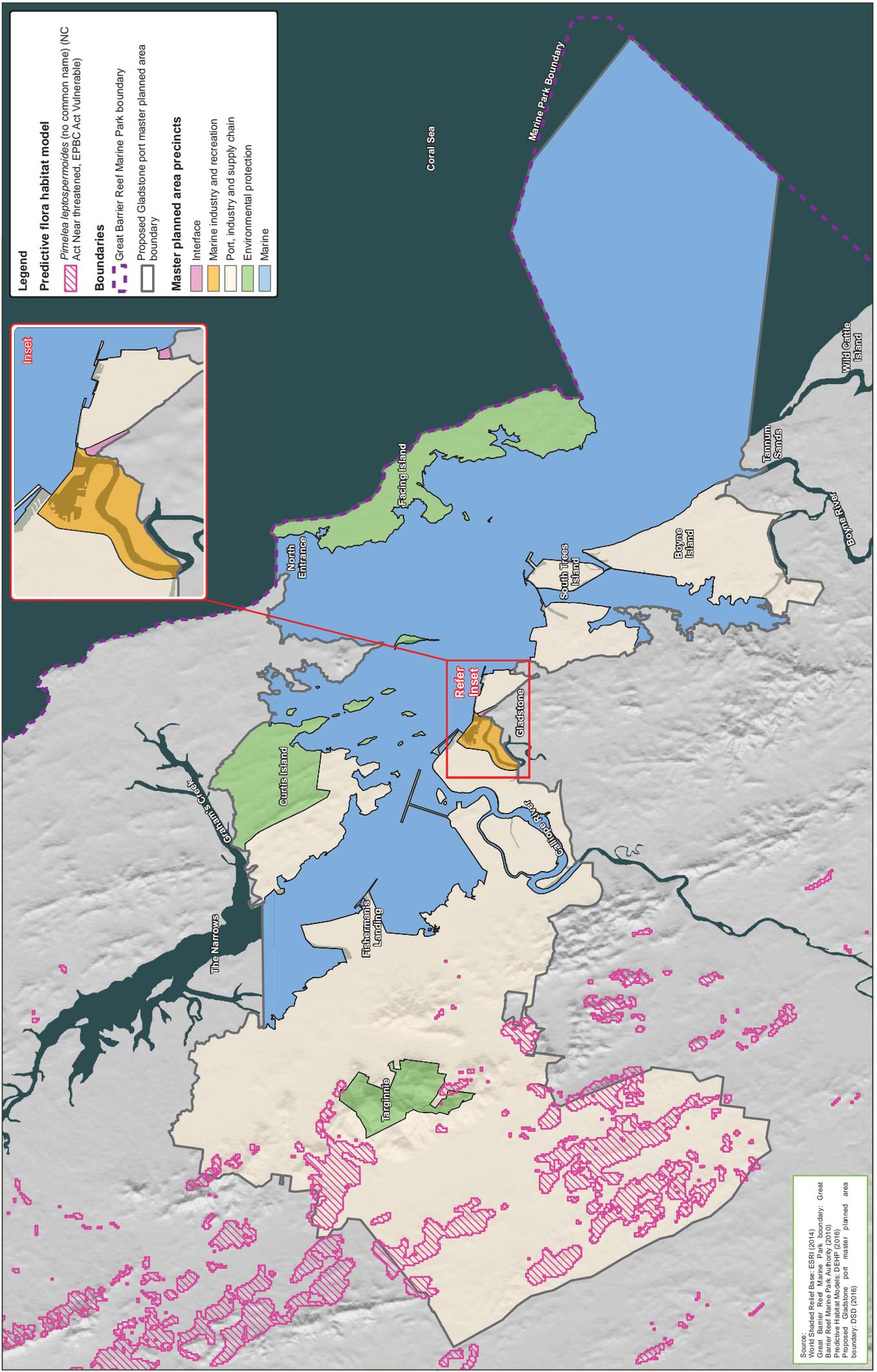
Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.55: Predictive flora habitat model - Mount Larcom silk pod (*Parsonsia larcomensis*)
 developed by the Department of Environment and Heritage Protection

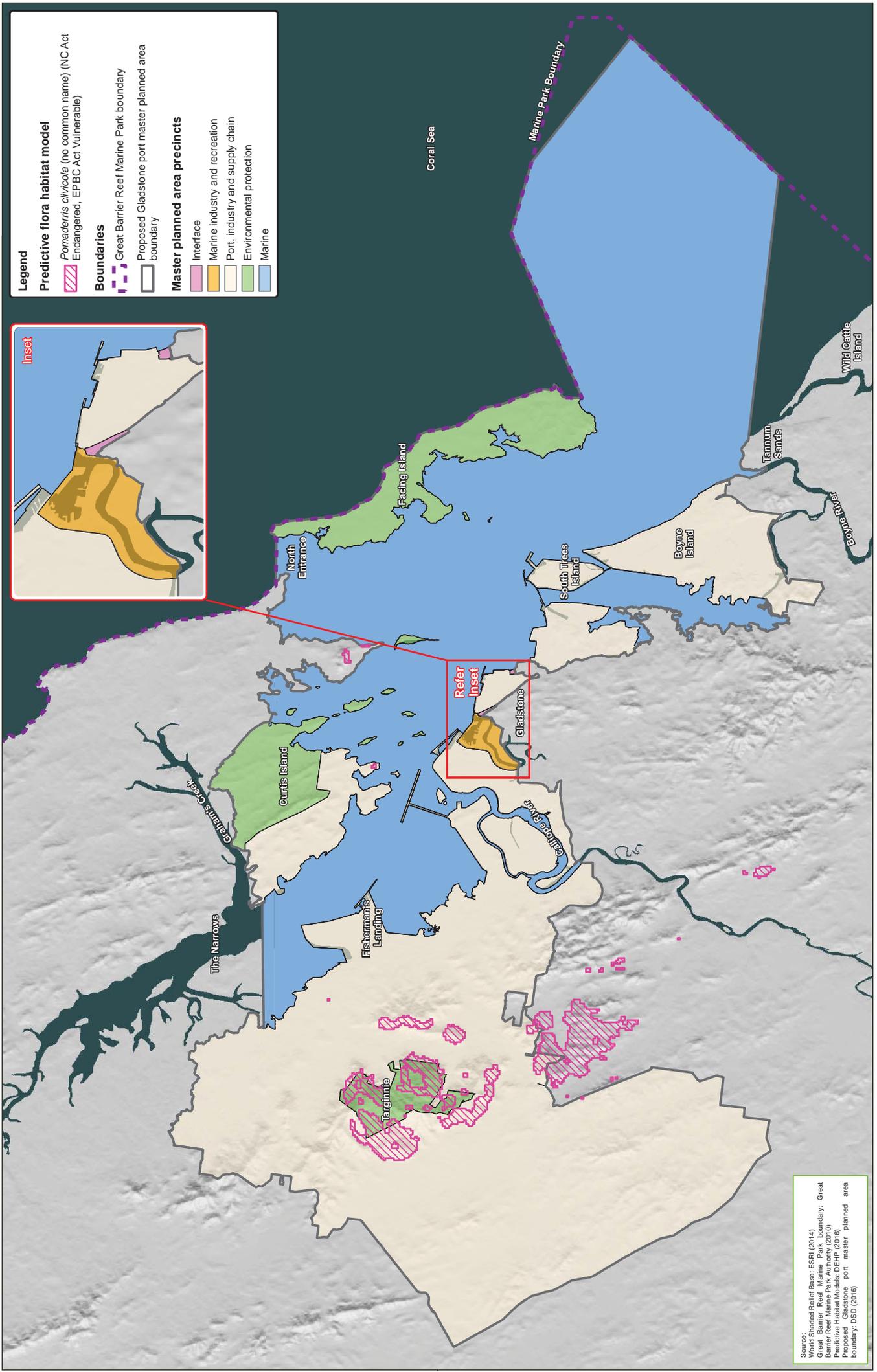


Gladstone port master planning risk assessment
 Predictive flora habitat model - Lesser swamp orchid (*Phaius australis*)
 developed by the Department of Environment and Heritage Protection



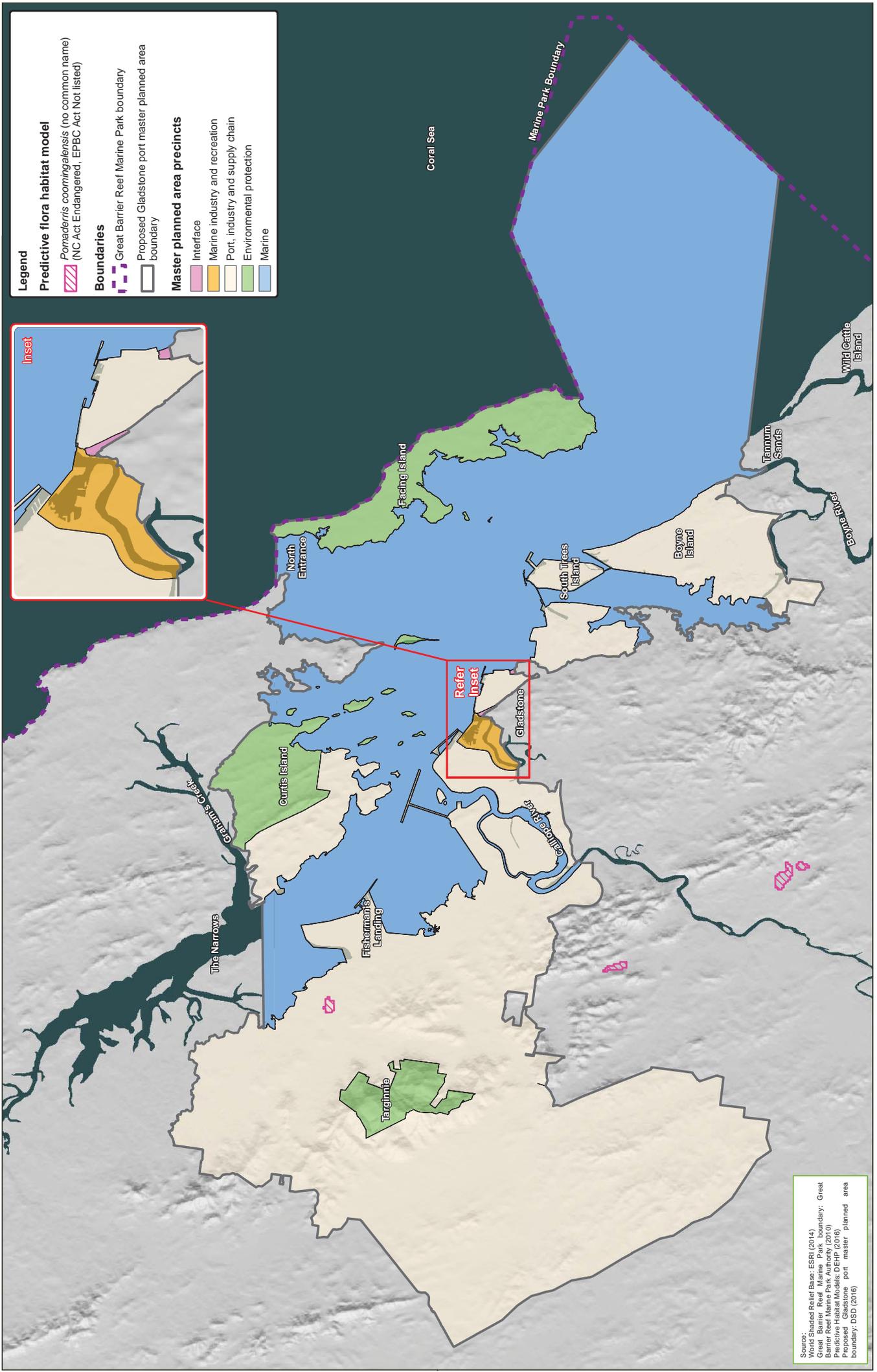


Gladstone port master planning risk assessment
Figure B.57: Predictive flora habitat model - *Pimelea leptospermoides*
 developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
Figure B.58: Predictive flora habitat model - *Pomaderris ciliicola*
 developed by the Department of Environment and Heritage Protection

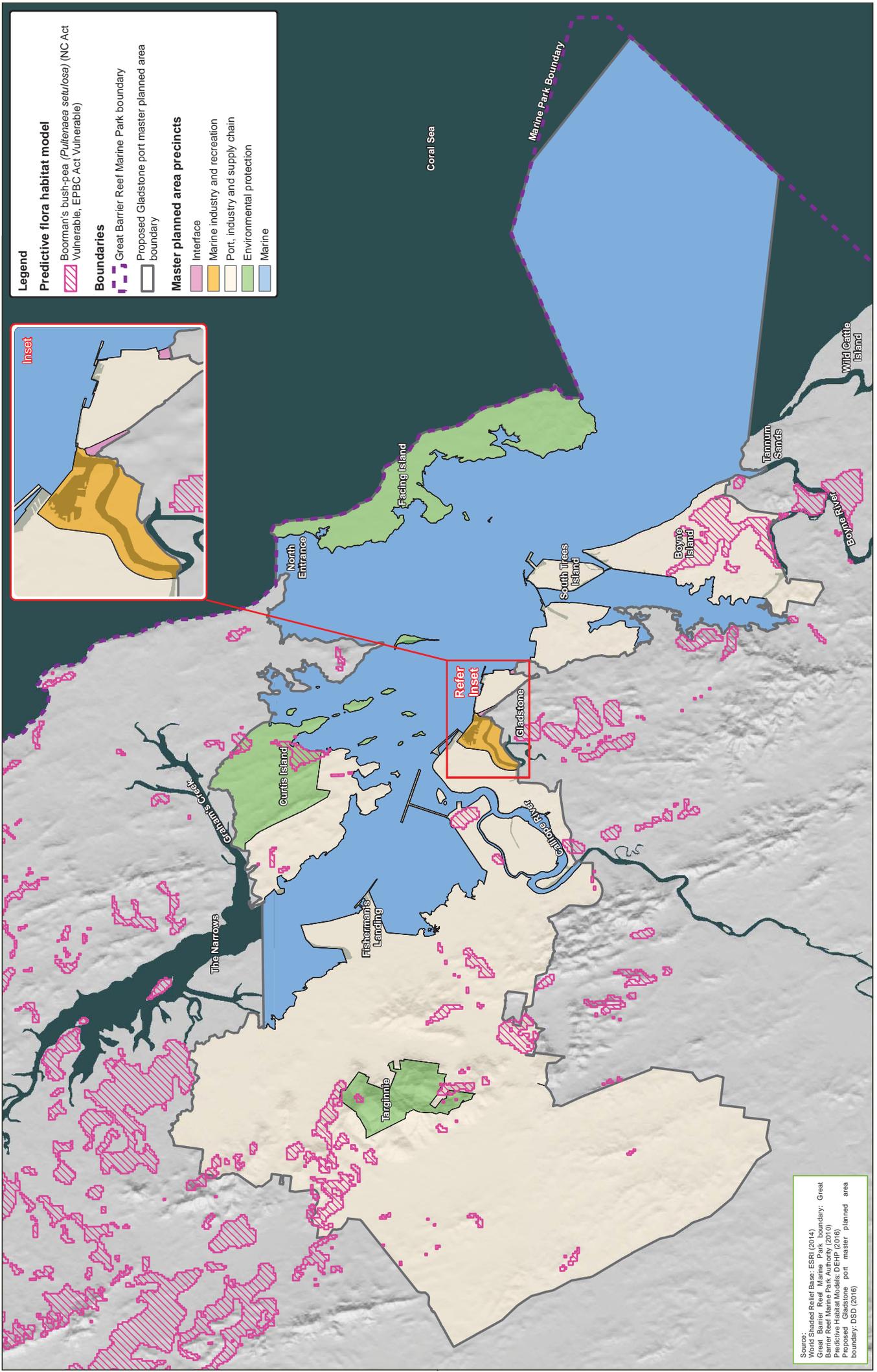




Gladstone port master planning risk assessment
Figure B.59: Predictive flora habitat model - *Pomaderris coomingalensis*
 developed by the Department of Environment and Heritage Protection

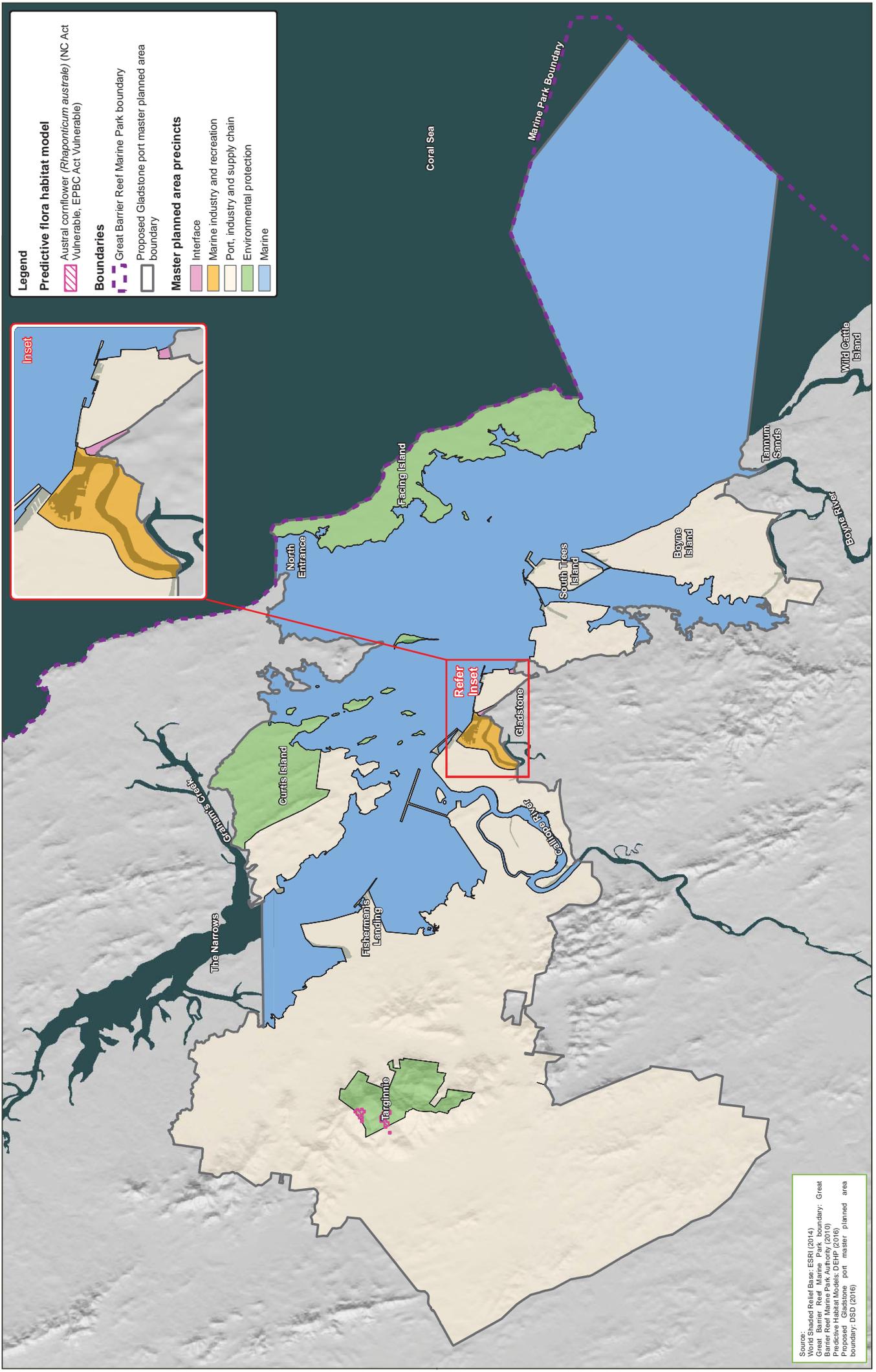


Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)

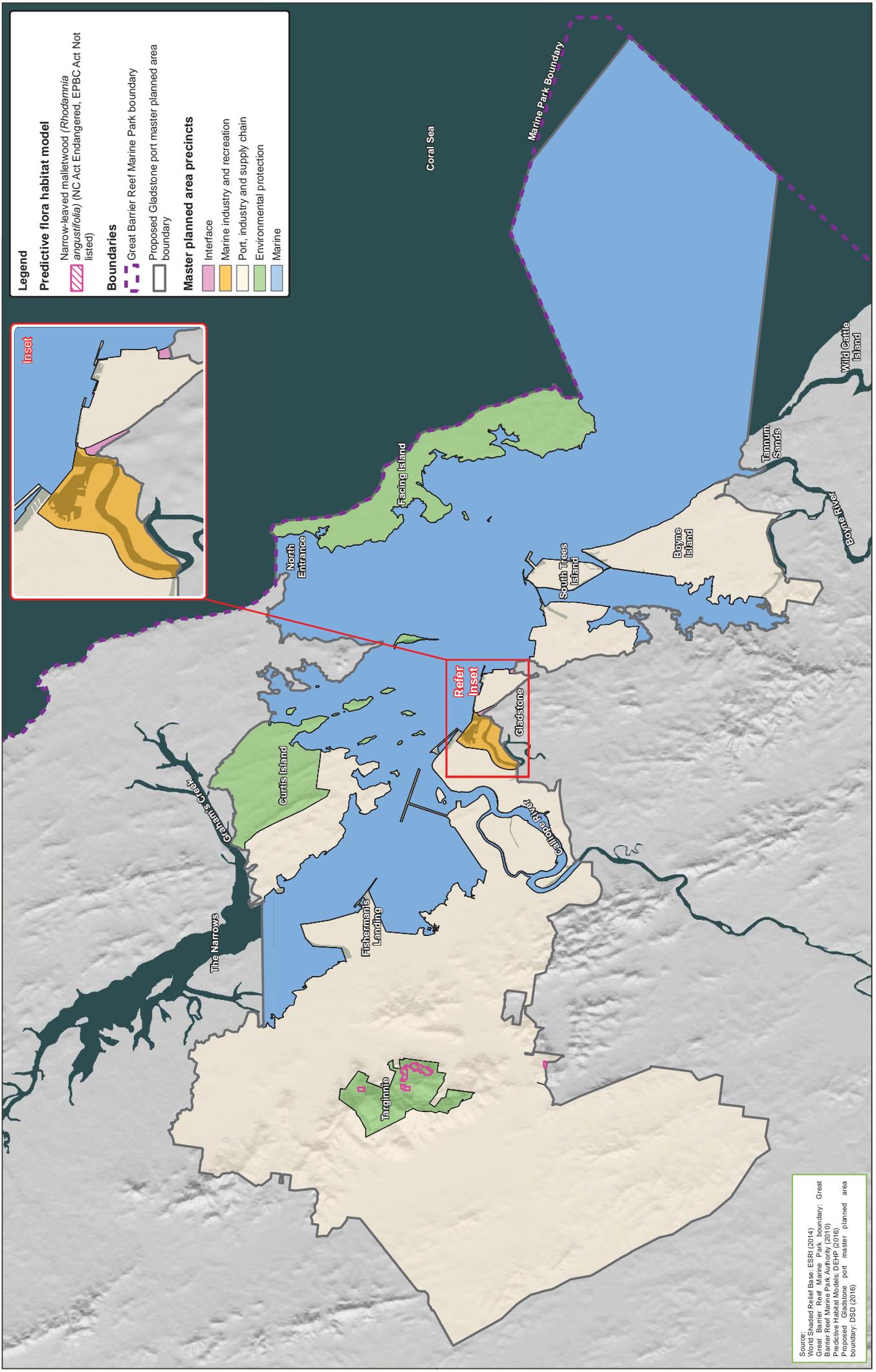


Gladstone port master planning risk assessment
Figure B.60: Predictive flora habitat model - Boorman's bush-pea (*Pultanea setulosa*)
 developed by the Department of Environment and Heritage Protection



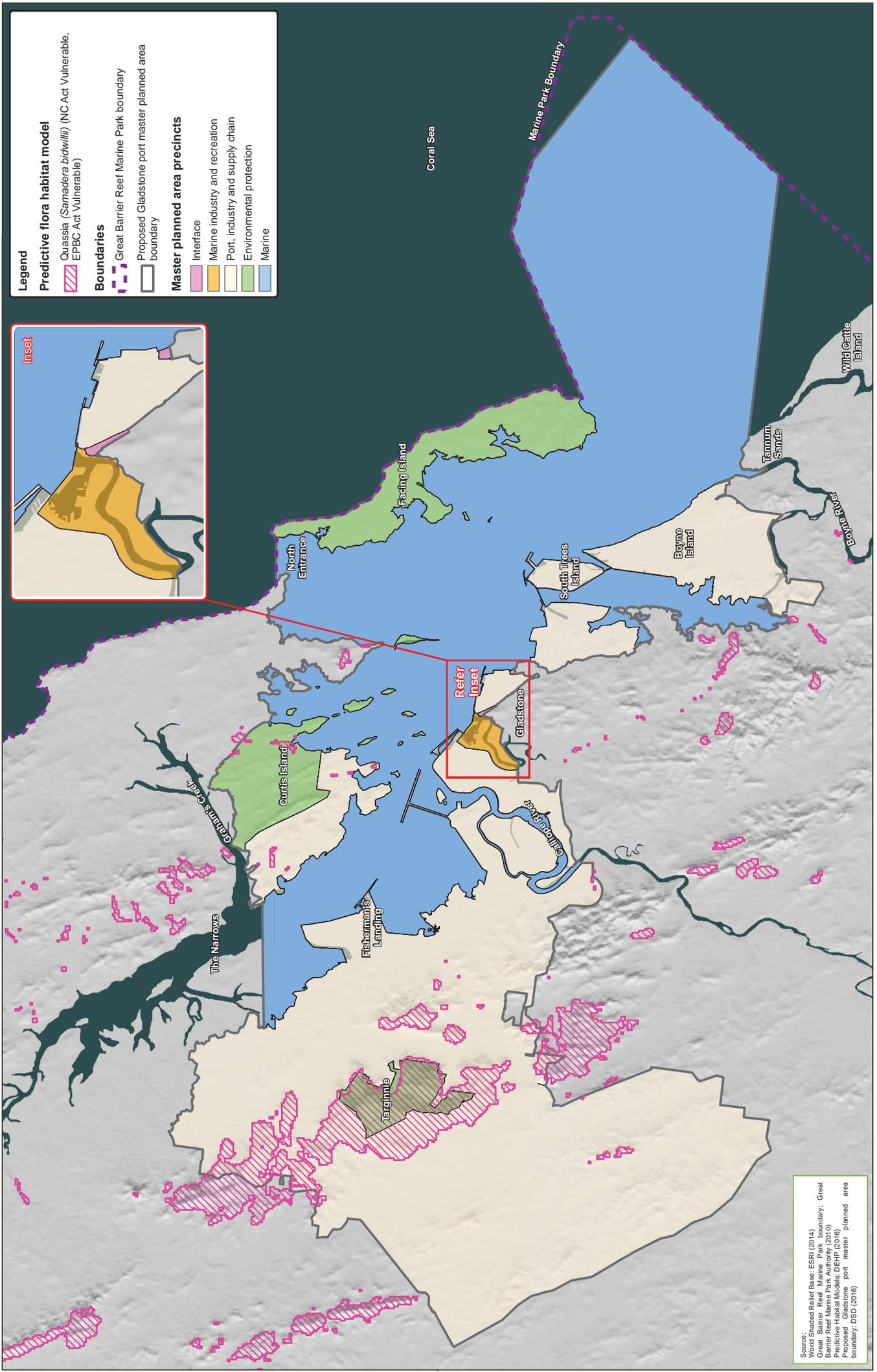


Gladstone port master planning risk assessment
Figure B.61: Predictive flora habitat model - Austral cornflower (*Rhoponticum australe*)
 developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
 Figure B.62: Predictive flora habitat model - Narrow-leaved malletwood (*Rhodamnia angustifolia*) developed by the Department of Environment and Heritage Protection



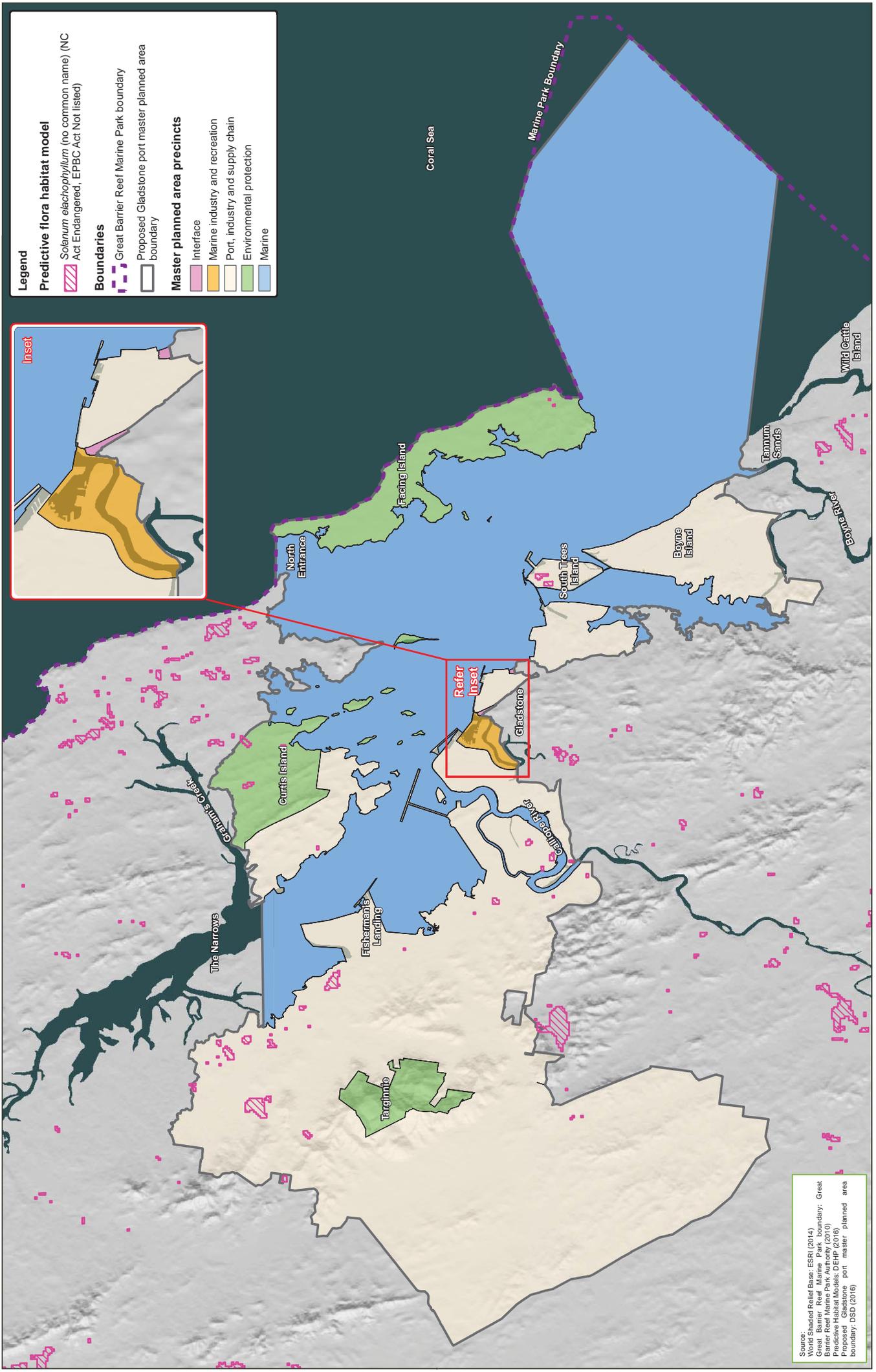


Gladstone port master planning risk assessment
Figure B.63: Predictive flora habitat model - Quassia (Samadera bidwillii)
 developed by the Department of Environment and Heritage Protection

Sources:
 World Shaded Relief Base: ESRI (2014)
 Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
 Predictive Flora Habitat Model: DDEHP (2016)
 Proposed Gladstone port master planned area boundary: DSD (2016)



Date: 22/08/2016 Version: 5 Job No: 251469
 Coordinate system: GDA 1994 MGA Zone 56



Legend

Predictive flora habitat model

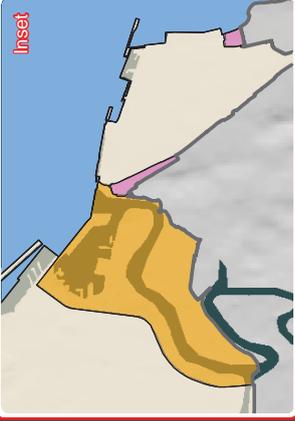
Solanum elaeagnifolium (no common name) (NC Act Endangered, EPBC Act Not listed)

Boundaries

Great Barrier Reef Marine Park boundary
Proposed Gladstone port master planned area boundary

Master planned area precincts

Interface
Marine industry and recreation
Port, industry and supply chain
Environmental protection
Marine

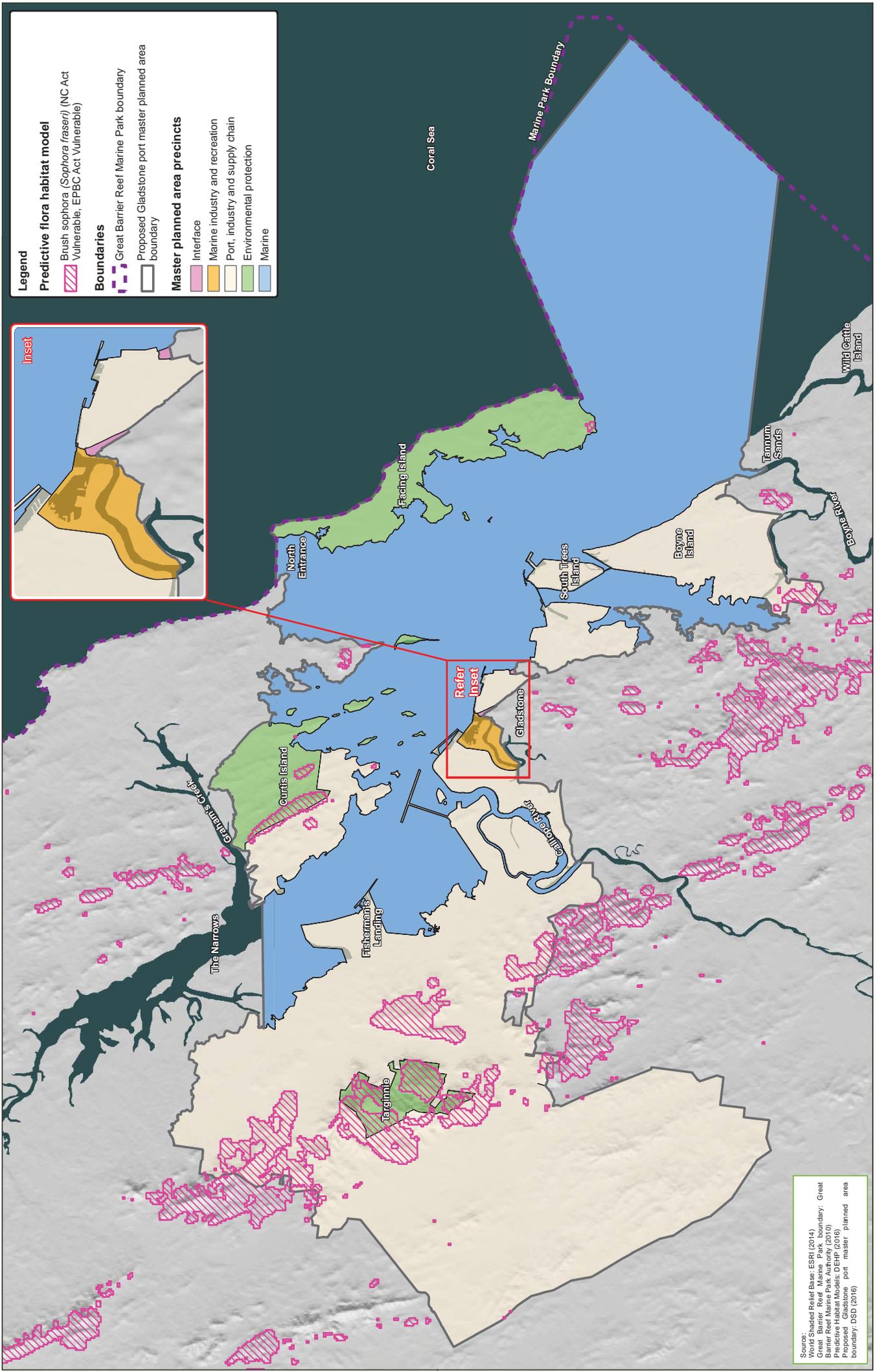


Sources:
World Shaded Relief Base: ESRI (2014)
Great Barrier Reef Marine Park boundary: Great Barrier Reef Marine Park Authority (2010)
Predictive Flora Habitat Model: Aurecon (2016)
Proposed Gladstone port master planned area boundary: DSD (2016)

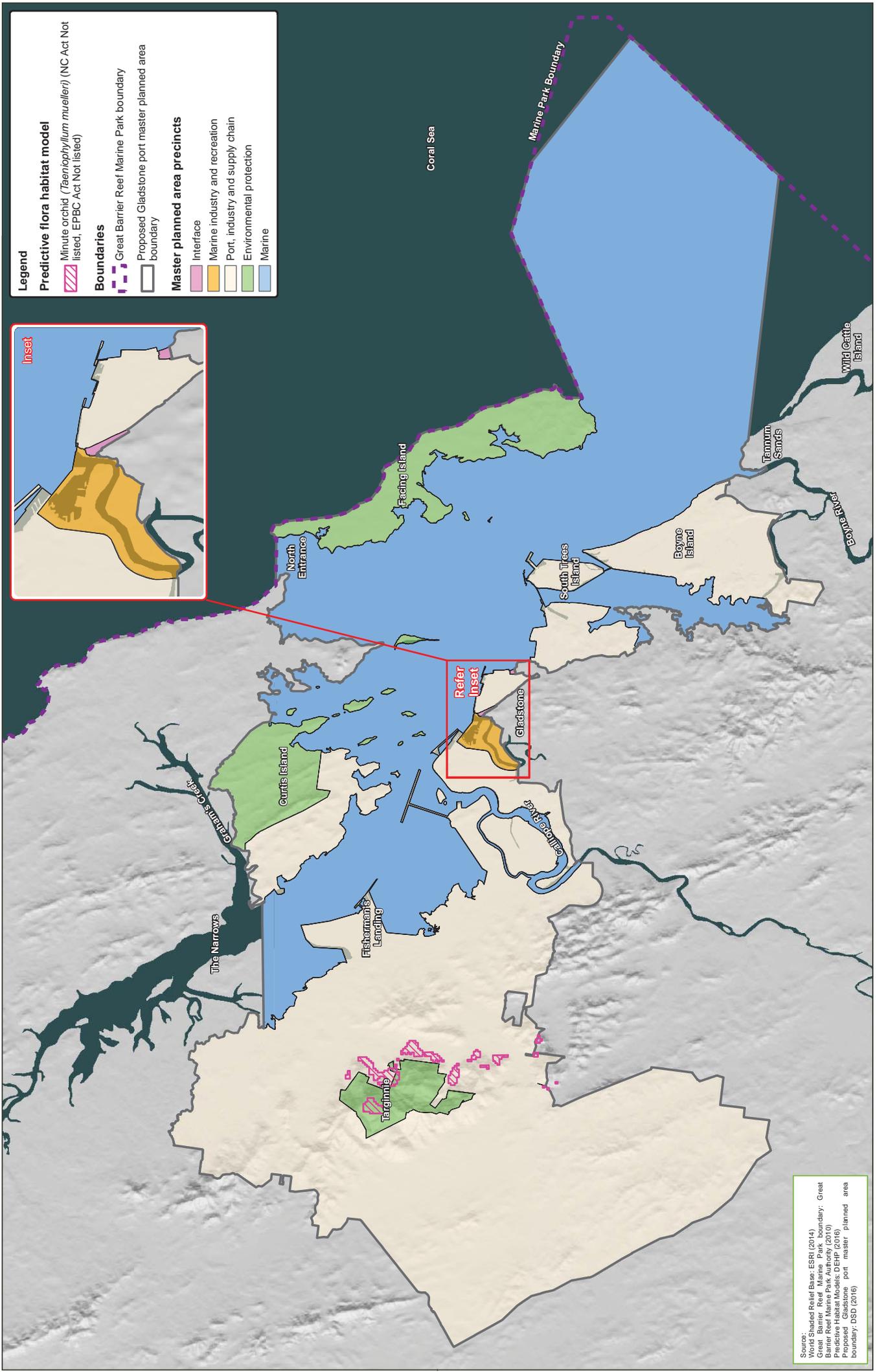


Date: 22/08/2016 Version: 5 Job No: 251469
Coordinate system: GDA 1994 MGA Zone 56

Gladstone port master planning risk assessment
Figure B.64: Predictive flora habitat model - *Solanum elaeagnifolium*
developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
Figure B.65: Predictive flora habitat model - Brush sophora (*Sophora fraseri*)
 developed by the Department of Environment and Heritage Protection



Gladstone port master planning risk assessment
Figure B.66: Predictive flora habitat model - Minute orchid (*Taeniophyllum muelleri*)
 developed by the Department of Environment and Heritage Protection



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Swaziland, Tanzania, Thailand, Uganda,
United Arab Emirates, Vietnam, Zimbabwe.

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