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Great Barrier Reef
Marine Park Authority



Queensland
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Monitoring islands within the Reef 2050 Integrated Monitoring and Reporting Program:

Final Report of the Islands Expert Group



The Great Barrier Reef Marine Park Authority acknowledges the continuing sea country management and custodianship of the Great Barrier Reef by Aboriginal and Torres Strait Islander Traditional Owners whose rich cultures, heritage values, enduring connections and shared efforts protect the Reef for future generations.

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Published by the Great Barrier Reef Marine Park Authority



ISBN 978-0-6487214-8-2

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A catalogue record for this publication is available from the National Library of Australia

This publication should be cited as:

Department of Environment and Science (Qld). 2019, *Monitoring Islands within the Reef 2050 Integrated Monitoring and Reporting Program: Final report of the Islands expert group*, Great Barrier Reef Marine Park Authority, Townsville.

Front cover image:

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Executive Summary

Effective management of the Great Barrier Reef World Heritage Area's (the World Heritage Area) extensive range and diversity of islands requires a sound understanding of past, current and emerging threats to island values. A key challenge to building this understanding is addressing the logistical, data management, and resource challenges and constraints that relate to gathering meaningful information across the vast geographic spread (348,000 square kilometres) of the approximately 1050 islands.

On-ground island management is primarily undertaken by the Reef Joint Field Management Program (the Program), with priority attention given to capturing observations about condition and trend in order to add to a strong evidence base for management. The Program adopts a largely tenure blind approach to monitoring across the range of island tenures (including 400 national park islands, 70 Commonwealth managed islands, numerous resort and other navigation and utility leases, Unallocated State Land, and Aboriginal-owned national parks islands). Thus healthy relationships with land owners and management or industry interests are essential for effective island management.

Given the logistical and resource constraints of understanding and managing such a complex array of islands, the Program prioritises its activities on specific sites where direct threats are high risk and where management actions will have positive and ongoing outcomes. Integral to this approach has been a shift in Program management focus to new systems and technologies that underpin a strong 'checking for change' culture and a focus on values based management. Sound (evidence-based) adaptive management and an increasing willingness and ability to intervene are central to the Program's approach.

Island conservation actions focus on protecting critical nesting and roosting sites of threatened species such as marine turtles, shorebirds and seabirds, and managing for threatened species and ecosystems. On-ground actions are rapidly moving towards a values-based adaptive management approach in order to maintain ecosystem integrity by targeting pest plants and animals and maintaining appropriate fire regimes. A more recent and now key element of the Program's 'checking for change' culture is a progressive approach to island biosecurity with a major emphasis on monitoring and reporting activities that support the prevention of new pest introductions through best practice quarantine and surveillance measures. The early detection of threats to islands, and the subsequent early control or eradication of threats, is increasingly being recognised as a crucial factor for the successful maintenance and rehabilitation of island values and the enhancement of overall island resilience.

In addition, monitoring and reporting activities are also proven to be extremely important in understanding and then managing the range of other important socio-economic island values, including tourism, adventure and recreational, Indigenous, historical (post-contact), and scenic and other aesthetic values. For example, islands provide a significant economic benefit to the Queensland and national economy, and the Program has an important role in supporting the region's tourism industry by presenting and maintaining the many premium island tourism destinations.

Effective planning and ongoing monitoring is essential to ensuring that visitor use is sustainable and that key tourism values are not 'loved to death'. The close monitoring of specifically identified island values enables the Program to better understand past, current and future visitor use trends and impacts to inform adaptive management. An important challenge is the monitoring of the many active island resorts to ensure any impacts are sustainable and consistent with lease conditions and other agreements. A key challenge also remains in oversight of the number of non-functioning resorts that have arisen as a consequence of economic downturn and/or adverse weather events, particularly cyclones.

The diversity and complexity of island values as well as their wide geographic spread and complex array of underlying tenures has resulted in a growing trend towards establishing strong and enduring management partnerships to facilitate ongoing monitoring and management. For example, working closely with Indigenous rangers and their parent organisations is essential to provide for both understanding and then implementation of best practice Indigenous cultural values management. Important recent initiatives in this regard include a number of formal agreements with Traditional Owners (including National Park (Cape York Peninsula Aboriginal Land) and Traditional Use of Marine Resource Agreements) and the development of cultural heritage management plans with a strong monitoring and assessment component such as the Raine Island Indigenous Cultural Heritage Management Plan (in draft). Another key Indigenous partnership initiative is developing joint work program and contract arrangements with Indigenous rangers to maximise the spread of 'checking for change' activities and the pooling and sharing of information. Examples of this type of collaboration include works and services contracts with the Giringun and Gidarjil Rangers and the Mandubarra people.

Further, expanding existing successful partnerships with volunteer organisations (such as adventure activity and other recreational organisations, bird watching groups and bush-walking clubs) to assist with monitoring and reporting activities has the potential to further expand surveillance and monitoring activities. For example, agreements with island mountain bike user groups have been developed with important self-regulation, monitoring and maintenance provisions.

Arguably one of the most important recent island management initiatives has been the adoption of the Queensland Parks and Wildlife Service (QPWS) Values Based Management Framework (VBMF). An essential element of the VBMF is keeping park values healthy as a consequence of:

- making sure that attention is given to managing and protecting the things (values) that matter most;
- focusing management effort on identified priorities;
- having decision support tools to guide our day-to-day management;
- building support for our management actions; and
- learning by doing and adaptive management.

Thus the newly introduced VBMF treats national park island management as a dynamic process based on a cycle of planning, prioritising, doing, monitoring, evaluating and reporting. These cyclic elements collectively drive the adaptation and improvement of management over time. The information gathered over time through VBMF is then used to

evaluate and report on whether management actions have been effective in achieving a range of identified desired park management outcomes.

While the structure and framework of key elements of the VBMF, such as statutory Management Plans and Management Statements, designated island Levels of Service, Health Checks, and Thematic Strategies (including specific fire, pest, visitor as well as an overarching monitoring and assessment strategy) are well established, the rollout of the framework, including its key monitoring and reporting components, remains a work-in-progress. Currently, for example, Health Checks are only routinely undertaken for Hinchinbrook Island National Park, given that only that particular park has a relatively advanced rollout of VBMF planning elements, including a statutory management plan in the new framework and a dedicated assessment and monitoring strategy. Nonetheless, QPWS has an extensive program for rollout of the VBMF across a number of priority island national parks within the World Heritage Area, with the initial focus on values assessment and identifying the Key Values for each island national park. The current focus, however, remains on a priority set of national park islands. Resources and logistical constraints permitting, the VBMF may eventually be able to be rolled out across other island protected areas and tenures, including Commonwealth islands.

The adoption of new and developing systems and technologies has the potential to further enhance the quality of monitoring and reporting, and better inform effective island management. The ongoing adoption and development of the tablet-based Field Reporting System (FRS) has been well embraced by QPWS rangers as an efficient and user-friendly system for recording and reporting marine and island-based management information including compliance, pest, and biosecurity (quarantine and surveillance) data. The relatively recent 'Island Watch' surveillance initiative also provides the Program with a quick and easy 'checking for change' monitoring tool particularly designed to be a simple record of observations of simple threats or changes at sites that rangers routinely visit as part of regular work programs. The Island Watch tool is currently being integrated into the FRS, an important advance for data capture, storage, interrogation, and reporting.

Drones are another relatively new technology that is starting to be utilised by the Program and other partner organisations to monitor and map island resources and values. For example, drones are now being successfully used in seabird monitoring trials and topographic mapping on Raine Island. Acoustic monitoring technology is also being used to monitor bird activity on islands, including Michaelmas Cay and the Capricorn Cays.

Direct management intervention is gaining a much higher profile in the Program's approach to island management, particularly given the continuing success of direct intervention strategies under the Raine Island Recovery Project, and other targeted species recovery projects including vegetation restoration on Tryon Island and Lady Elliot Island. An essential component of direct management intervention is a rigorous monitoring and reporting regime to not only inform the adaptive management cycle but also to communicate with partners and other stakeholders (including Traditional Owners, philanthropic funding entities, and community groups) the progress or otherwise of the intervention.

However, despite the establishment of new partnerships with Indigenous rangers and volunteer groups, the advancement of new data capture and reporting technologies, and the

adoption of innovative planning and monitoring systems such as the VBMF, resource and logistical constraints as well as new emerging threats and opportunities will always require island managers to prioritise and readjust (and at times rethink) their management approach. The tyranny of distance and weather challenges, the high cost of maintaining a safe and efficient vessel fleet, and the challenge of understanding the values of often remote, inaccessible, and (at times) poorly understood islands will always remain a challenge for even the most thorough and comprehensive monitoring and reporting strategies.

Contents

ACKNOWLEDGEMENTS	1
EXECUTIVE SUMMARY	2
1.0 BACKGROUND AND DESIGN CONSIDERATIONS	8
1.1 OBJECTIVES OF THE REEF 2050 INTEGRATED MONITORING AND REPORTING PROGRAM	9
1.2 INFORMATION NEEDS FOR THE GREAT BARRIER REEF OUTLOOK REPORT AND OTHER REPORTING REQUIREMENTS	12
1.3 RELEVANT REEF 2050 LONG-TERM SUSTAINABILITY PLAN TARGETS, OBJECTIVES AND OUTCOMES	14
2.0 CURRENT UNDERSTANDING OF ISLAND SYSTEMS AND STATUS ON THE GREAT BARRIER REEF	14
2.1 ISLAND SYSTEMS ON THE GREAT BARRIER REEF	14
2.2 CURRENT STATUS OF ISLAND SYSTEMS ON THE GREAT BARRIER REEF	16
3.0 PRIORITY INDICATORS TO MONITOR ISLANDS ON THE GREAT BARRIER REEF	17
4.0 EVALUATION OF THE ADEQUACY OF CURRENT MONITORING OF ISLANDS ON THE GREAT BARRIER REEF 17	
4.1 SYNOPSIS OF EXISTING MONITORING PROGRAMS	17
4.2 ADEQUACY OF EXISTING MONITORING PROGRAMS	21
4.3 GAPS IN CURRENT MONITORING EFFORT	23
5.0 NEW TECHNOLOGIES FOR MONITORING ISLANDS ON THE GREAT BARRIER REEF	25
6.0 RECOMMENDATIONS FOR INTEGRATED MONITORING OF ISLANDS ON THE GREAT BARRIER REEF ..	25
7.0 ASSESSMENT OF THE RESOURCES REQUIRED TO IMPLEMENT THE RECOMMENDED DESIGN	27
8.0 REFERENCES	28
9.0 APPENDIX 1 ISLAND LEVELS OF SERVICE, VALUES AND INDICATORS	29
10.0 APPENDIX 2 QPWS VALUES BASED MANAGEMENT FRAMEWORK – LEVELS OF SERVICE	34
11.0 APPENDIX 3 ISLANDS WITH NO REGIONAL ECOSYSTEM MAPPING – PRIORITY FOR MAPPING	37
12.0 APPENDIX 4 KEY NATURAL VALUES (ECOSYSTEMS) IDENTIFIED THROUGH THE QPWS VALUES BASED MANAGEMENT FRAMEWORK BECAUSE OF THEIR SIGNIFICANCE (E.G. THREATENED OR ENDEMIC ECOSYSTEMS)	40
12.1 APPENDIX 4A ENDANGERED REGIONAL ECOSYSTEMS ON NATIONAL PARK ISLANDS	42
12.2 APPENDIX 4B KEY NATURAL VALUES (ECOSYSTEMS) IDENTIFIED THROUGH THE QPWS VALUES BASED MANAGEMENT FRAMEWORK BECAUSE OF THEIR IMPORTANCE AS HABITAT FOR SIGNIFICANT SPECIES.	47
12.3 APPENDIX 4C KEY HISTORIC AND INDIGENOUS VALUES IDENTIFIED THROUGH THE QPWS VALUES BASED MANAGEMENT FRAMEWORK AND QPWS HISTORIC CULTURAL HERITAGE STRATEGY	48
12.4 APPENDIX 4D KEY VISITOR VALUES IDENTIFIED THROUGH THE QPWS VALUES BASED MANAGEMENT FRAMEWORK	49
13.0 APPENDIX 5 QPWS VALUES BASED MANAGEMENT FRAMEWORK – HEALTH CHECK MONITORING ..	50
13.1 APPENDIX 5A NATURAL VALUES	51
13.2 APPENDIX 5B HISTORIC (SHARED) VALUES	53
13.3 APPENDIX 5C VISITOR VALUES	54

14.0	APPENDIX 6 BIOCONDITION – SUMMARY OF THE FUNCTIONAL ROLE OF VEGETATION FOR BIODIVERSITY AND INDICATORS OF THOSE FUNCTIONS	55
15.0	APPENDIX 7 ISLAND WATCH.....	56
16.0	APPENDIX 8 GREAT BARRIER REEF WORLD HERITAGE AREA ISLAND PEST MONITORING – BIOSECURITY SURVEILLANCE	58

1.0 Background and design considerations

The maze of 1050 islands is spread over 348,000 square kilometres and provides a major logistical and resource challenge to island managers given the vast distances, remoteness, access, safety and weather conditions often involved. Not only is it imperative that the Reef Joint Field Management Program (the Program) maintains a well-resourced, multi-tasking, safe and reliable vessel fleet to meet these challenges, it also needs to ensure that its on-ground management actions are efficient and effective as evidenced by monitoring, assessment and reporting that, in turn, meaningfully inform management actions and priorities. The large open-ocean patrol vessel, *Reef Ranger*, and a soon to be available sister vessel, provide an invaluable platform to enable the monitoring of the Great Barrier Reef (the Reef) and island condition, and the identification of emerging threats.

Management of the islands in the World Heritage Area is complex, and a range of tenures and management arrangements apply. Of the 1050 islands Reef-wide, approximately 70 are Commonwealth islands. The State of Queensland has jurisdiction over approximately 980 islands, about 400 of which are protected areas (national parks), with tenure on the remainder including leasehold, freehold, Aboriginal owned land, unallocated state land, Commonwealth or Deed-of-Grant in Trust land, or a combination of tenures.

Twenty of the 70 Commonwealth islands include Aids to Navigation or light stations, and in a gradual process starting in 1988, responsibility for management of those islands was transferred from the Australian Maritime Safety Authority to the Great Barrier Reef Marine Park Authority (the Authority). The Australian Maritime Safety Authority remains responsible for the operation and maintenance of the Aids to Navigation, and leases back the portion of land where the Aid to Navigation is located from the Authority. The Department of Defence is responsible for 49 Commonwealth islands in the World Heritage Area and the Department of Finance is responsible for one island. A number of national park islands off the coast Cape York Peninsula are Aboriginal owned under State legislation but jointly managed as a protected area (National Park (Cape York Peninsula Aboriginal land)) under statutory agreements between the Aboriginal land holding entity and the Queensland Government, represented by QPWS.

The quantitative condition or trend of island status can only be inferred if sampling yields a dataset with sufficient power to detect change. Further, inferences, or extrapolation from sampled sites to broader areas can only be statistically sound if site selection is probability based (i.e. every area has a defined probability of being selected in a sampling regime). However, given the logistical and resource constraints of island management across such a vast and complex expanse, rigorous condition and trend research and analysis is only feasible in high priority targeted locations. A more practical and sustainable approach is required for other island locations.

While comprehensive monitoring and assessment regimes are in place in some island locations, including under the Raine Island Recovery Project, the Program largely relies on a suite of user-friendly, less resource intense tools to monitor condition and trend of island values. Thus simple 'checking for change' activities have become an integral element of Program business. Checking for change identifies impacts from the main risks to the World

Heritage Area (including the islands) which, in turn, enables appropriate management actions to be considered and implemented to build resilience and deliver the *Reef 2050 Long-Term Sustainability Plan* (the Reef 2050 Plan).

Thus given the logistical and resource challenges of the island management context, and the finite quantity of funding available, World Heritage Area managers need to ‘sharpen the axe’ with regard to their suite of management tools, to ensure any monitoring and assessment activities are prioritised and outcomes focussed.

QPWS is currently implementing a relatively new values-based approach to island management. Known as the Values Based Management Framework (VBMF) (refer to ensuing sections; also Appendix 2, 4a, 4c, 4d, 4e, 5 for further details), it provides the cornerstone for island national park management (including priority setting, monitoring, assessment and reporting).

While much attention historically has been afforded to island ecosystem health and biodiversity themes, the VBMF facilitates a holistic approach to island values management, with a focus on monitoring the condition and trend of a range of other key (priority) values including (but not restricted to) historical, visitor use, amenity/aesthetic, and Traditional Owner values. With dedicated resources a diversity of island monitoring themes can now be documented within the one consistent framework.

Many aspects of island associated management will be considered in more detail through reports developed by other Reef 2050 Integrated Monitoring and Reporting Program thematic expert groups.

1.1 Objectives of the Reef 2050 Integrated Monitoring and Reporting Program

The Reef 2050 Plan provides an overarching strategy for managing the Reef. It contains actions, targets, objectives and outcomes to address threats and protect and improve the Reef’s health and resilience, while allowing ecologically sustainable use. The Reef 2050 Plan has been developed in consultation with partners, including Traditional Owners and the resource, ports, fishing, agriculture, local government, research and conservation sectors.

A key component of the Reef 2050 Plan is the establishment of the Reef 2050 Integrated Monitoring and Reporting Program (RIMReP). RIMReP will provide a comprehensive and up-to-date understanding of the Reef — the values and processes that support it and the threats that affect it. This knowledge is fundamental to informing actions required to protect and improve the Reef’s condition and to drive resilience-based management.

There are currently over 90 monitoring programs operating in the World Heritage Area and adjacent catchment. These programs have been designed for a variety of purposes and operate at a variety of spatial and temporal scales. The comprehensive strategic assessments of the World Heritage Area and adjacent coastal zone — both of which formed the basis for the Reef 2050 Plan — identified the need to ensure existing monitoring programs align with each other and with management objectives. RIMReP will fulfil this need.

RIMReP will provide information across the seven themes that make up the Reef 2050 Plan Outcomes Framework. The themes are ecosystem health; biodiversity; water quality; heritage; community benefits; economic benefits and governance.

The intent of RIMReP is not to duplicate existing arrangements but to coordinate and integrate existing monitoring, modelling and reporting programs across disciplines. For example, the Reef 2050 Water Quality Improvement Plan underpins the Reef 2050 Plan's water quality theme and its Paddock to Reef 2050 Integrated Monitoring, Modelling and Reporting Program will form a key part of the new integrated program.

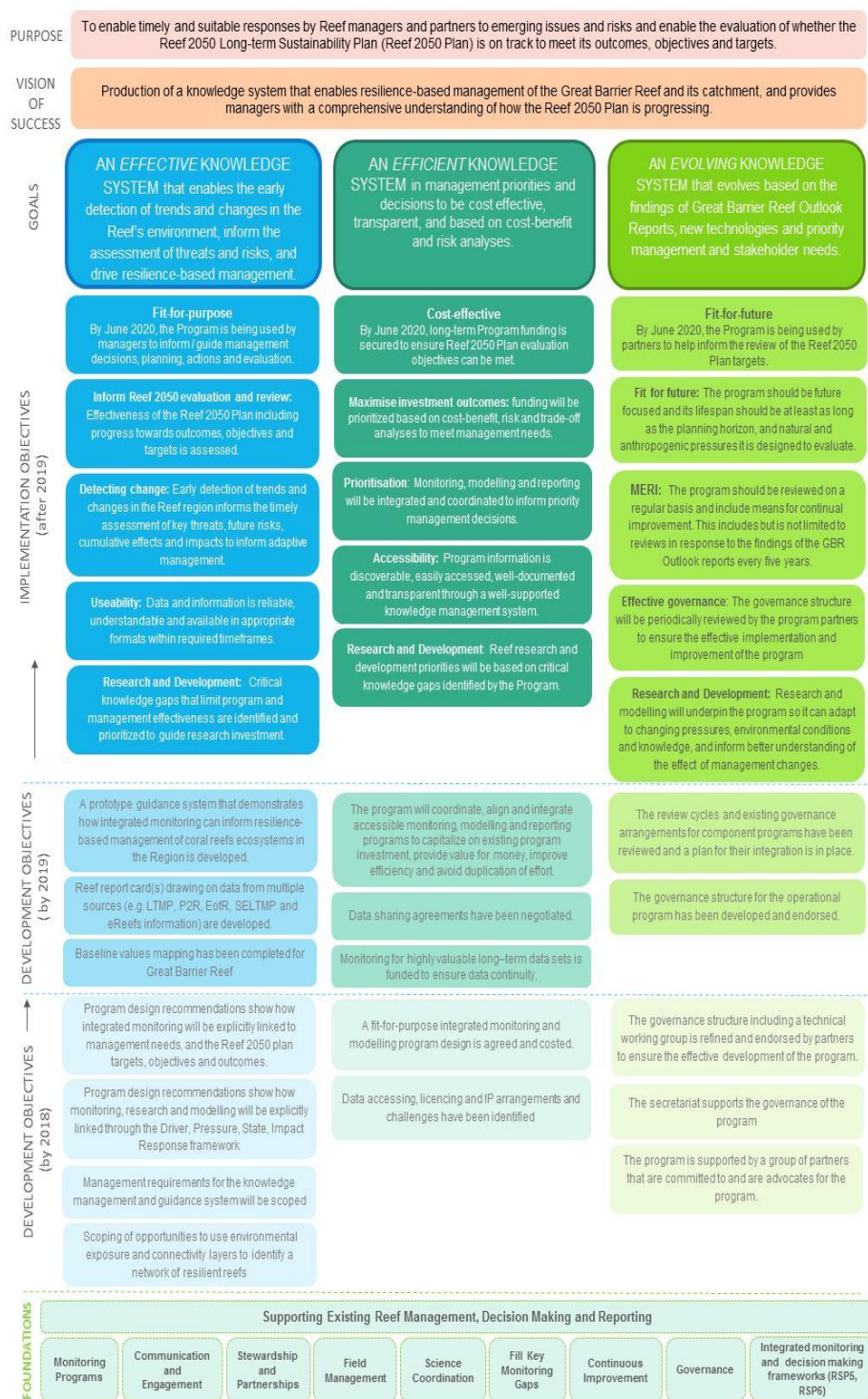
As the driver of resilience-based management under the Reef 2050 Plan, RIMReP's primary purpose is to enable timely and suitable responses by Reef managers and partners to emerging issues and risks, and enable the evaluation of whether the Reef 2050 Plan is on track to meet its outcomes, objectives and targets.

RIMReP's vision is to develop a knowledge system that enables resilience-based management of the Reef and its catchment, and provides managers with a comprehensive understanding of how the Reef 2050 Plan is progressing.

Three goals for the knowledge system are that it is:

- **Effective** in enabling the early detection of trends and changes in the Reef's environment, inform the assessment of threats and risks, and drive resilience-based management.
- **Efficient** in enabling management priorities and decisions to be cost effective, transparent, and based on cost-benefit and risk analyses.
- **Evolving** based on the findings of Great Barrier Reef Outlook Reports, new technologies and priority management and stakeholder needs.

RIMReP will be central to ensuring decisions regarding the protection and management of the Reef are based on the best available science, consistent with the principles of transparency and accountability, and underpinned by a partnership approach.



RIMReP program logic. Each of the three goals has associated development and implementation objectives as well as foundational inputs.

1.2 Information needs for the Great Barrier Reef Outlook Report and other reporting requirements

The monitoring needs of the World Heritage Area islands are driven in the first instance by a need to understand the nature, condition and trend of island values. Spatial, logistical and temporal factors also come into consideration for the prioritising and gathering of information needs (as well as other aspects of island planning). However, the logistical challenges and complexity of the vast array of World Heritage Area islands, as well as the varying degree of potential threats to values, dictates a strategic and priority approach to determining island monitoring needs. For example, some islands which are recognised as key habitat nodes, and have been the focus of previous management efforts, or are otherwise recognised as being of high value or high use, may be subject to monitoring for a more comprehensive set of indicators. Raine and Lady Elliot Islands, for example, have very specific tactical needs based largely on risk to values. This local scale, tactical response approach tends to be issues driven, with monitoring utilised to:

- identify decline, or issues of concern;
- identify work priorities to address threats or improve condition where required;
- evaluate management effectiveness;
- report on condition and trend and provide recommendations for future management and resourcing; and
- inform values based management frameworks e.g. pest and weed management, fire management, infrastructure management.

In contrast, very remote, relatively low risk and infrequently visited islands tend to receive far less or no monitoring attention, and utilise a simpler more pragmatic approach to checking for change such as afforded by the Island Watch monitoring tool (Appendix 7). Those islands with little or no monitoring in place have typically been designated with a low Level of Service status (Appendix 2).

Monitoring is an important part of the VBMF, allowing QPWS to systematically track the condition of island values and its efforts towards managing them. It includes collecting and processing relevant, reliable data and information on park values, and allows for the evaluation of performance and then the fine-tuning of management strategies and objectives. VBMF monitoring programs are focused on key values, and provide information (especially the condition and trend of key values) to improve park management. The VBMF planning process determines which values require monitoring. Thus the VBMF provides an important decision making tool for identifying priority monitoring needs particularly across the 400 national park islands within the World Heritage Area.

A large range of other planning tools are also available to manage islands, including complementary state and Commonwealth zoning (with specific zoning for all Commonwealth islands and Special Management Areas), joint field management business plans, Marine Park plans of management, and Queensland Government national park management plans and management statements. Information needs for these tools are about assessing their management effectiveness, as well as informing and prioritising management decisions.

Monitoring of coastal birds, turtles, pests and weeds is undertaken to assess the condition and trend of key species and habitats. Controlling or eradicating pest plants and animals is risk-based and effective at locations where resources are focused (for example, successful eradication of feral pigs from Wild Duck Island, removal of rats from Boydong Island, and controlling outbreaks of scale insects responsible for the destruction of *Pisonia* forests on Tryon Island). In an island context, this is significant because it shows eradication of introduced species is an achievable outcome — with concerted effort, pest programs can be finite and deliver enduring conservation benefits. However, to remain effective, these programs must be coupled with a strong focus on biosecurity, quarantine and surveillance, as preventing adverse environmental impacts is more cost-effective than managing or reversing them.

The Authority and the Department of Defence have responsibility for the protection of natural, historic and cultural heritage values on the 70 Commonwealth-owned islands. Regimes are in place to provide an overarching level of management for these islands (for example, zoning, regulations, surveillance and enforcement).

A number of Indigenous ranger groups also undertake island values monitoring either in partnership with the Program or under their own management and planning frameworks (e.g. Indigenous Protected Area, Indigenous Management (Cape York Peninsula), and Traditional Use of Marine Resource Agreements). These groups bring an extremely important cultural landscape perspective to values identification, monitoring and management.

The *Regional Planning Interests Act 2014* (the RPI Act) protects areas of regional interest from inappropriate development and assists with resolving land use conflict for those activities outside the jurisdiction of the *Sustainable Planning Act 2009* (e.g. resource activities). To achieve this alignment, the RPI Act introduces an assessment framework to manage the impact of resource activities and other regulated activities on areas of the state identified in the Act as an area of regional interest.

Five Strategic Environmental Areas, including Hinchinbrook Island and areas on Cape York Peninsula, have currently been identified as containing regionally significant environmental attributes (for example bio-diversity, water catchments and ecological function). Within these areas, protection of ecological integrity is the priority land use.

The diversity of Commonwealth and State statutory, policy and planning frameworks that apply to the islands drives a large number of reporting requirements that are beyond the scope of this report to note in detail. For QPWS (and the Program generally) this ranges from the Program's annual business plan and 5-year strategic plan reporting, specific strategy reporting (e.g. Raine Island Recovery Project and Curtis Island LNG offset program) through to the proposed development of a Queensland State of the Parks Report. This latter report will provide a State-wide picture of how the park system is faring. It will focus on both mainland and island protected areas, with primary attention given to 'iconic' parks including places like Hinchinbrook Island National Park. Further, the Program's annual business plan (and associated reporting) now directly maps Reef 2050 Plan actions to Field Management High Level Strategies and related activities.

1.3 Relevant Reef 2050 Long-Term Sustainability Plan targets, objectives and outcomes

While there is a strong emphasis on marine and intertidal habitats, the Reef 2050 Plan also contains many outcomes, objectives and targets directly relevant to islands, or parts of islands; with indicators that have been chosen through years of management experience (Appendix 1).

Particular Reef 2050 Plan outcomes of note include:

- Ecosystem Health Outcome 2050: The status and ecological functions of ecosystems within the Great Barrier Reef World Heritage Area are in at least good condition with a stable to improving trend.
- Biodiversity Outcome 2050: The Reef maintains its diversity of species and ecological habitats in at least a good condition with a stable to improving trend.

In this context, islands and/or parts of islands can be considered ecosystems. Islands also include many species and habitats of ecological and cultural significance.

Key Reef 2050 Plan island actions include (*Periodic Review Report 2017*):

- Protect seabird nesting and foraging (BA11)
- Implement Raine Island Recovery (BA22)
- Restore island habitats and eradicate pests (BA24)
- Develop light station heritage management plans (HA8)
- Coordinate field activities for visitors (CBA8f)
- Provide visitor infrastructure (CBA8h)
- Add to the island protected area estate (EHA9)
- Implement recovery programs (Reef Recovery Plans) (EHA13)

Appendix 1 provides further details of Reef 2050 Plan targets, goals and outcomes particularly as they relate to the monitoring and assessment of the diversity of key island values.

Although beyond the scope of this particular report to detail, there are also a number of other important Reef 2050 Plan drivers for enhanced Traditional Owner involvement in island management. Developing new and expanding existing partnerships with Indigenous ranger groups, for example, is recognised as an important way to more efficiently and effectively meet the full array of island management needs (including values monitoring, assessment and reporting).

2.0 Current understanding of island systems and status on the Great Barrier Reef

2.1 Island Systems on the Great Barrier Reef

Islands contribute to all four of the natural criteria for which the World Heritage Area was listed in 1981: exceptional natural beauty, significant geomorphic features, significant ongoing ecological and biological processes, and significant natural habitats for the conservation of biological diversity.

There are about 1050 islands in the World Heritage Area — these are exceptionally diverse in terms of their geography, geomorphology and ecology. Islands are a unique component of the World Heritage Area and critical to its integrity. Interconnected reef and island ecosystems support some of the richest biodiversity on the planet. For example, continental islands and cays in the World Heritage Area support more than 200 bird species, many of which are in breeding colonies, while providing globally important nesting sites for marine turtles.

Islands function as important refugia for plants and animals, protecting them from impacts prevalent on the mainland, and some habitats are found only on islands of the World Heritage Area (such as *Pisonia* forests). Islands are also key links in connecting terrestrial habitats along coastal and offshore areas (Turner and Blatianoff 2007). These connections are intricately dependent on the species which have evolved to live on islands. This is typified by the relationship between Wet Tropics rainforests, Reef islands, and the pied imperial pigeon (Figure 9.2 Strategic Assessment Report; Great Barrier Reef Marine Park Authority (2014)). Other island bird species migrate or move between many countries across the South Pacific region and beyond.

Further details pertaining to World Heritage Area island key natural values (as identified through the VBMF) are provided as follows:

Appendix 4a – key natural ecosystem values (including threatened or endemic ecosystems);

Appendix 4b – endangered regional ecosystems on national park islands; and

Appendix 4c – national park islands containing important high value ecosystems as habitat for significant species.

In addition to their natural values, many islands have significant cultural heritage values for Aboriginal and Torres Strait Islander peoples (Appendix 4d). They include a diversity of sites of archaeological and cultural significance such as fish traps, middens, rock quarries, story sites and rock art. Well known examples are on Lizard, Hinchinbrook, Stanley, Cliff and Clack islands and in the Whitsundays where there are spectacular galleries of rock paintings. These story places and other tangible cultural features remain extremely significant to the approximately 70 different Traditional Owner groups who view the World Heritage Area as an integrated system of distinct living cultural landscapes, maintaining an enduring connection to their land and sea country.

Many islands also have significant historic heritage values including historic light stations associated with shipping and navigational history (e.g. Low Isles and Lady Elliot Island), built features that reflect early post-contact industry and settlement (e.g. Lizard Island), and World War 2 fortifications and gun emplacements (e.g. Magnetic Island) (Appendix 4d). A number of islands throughout the World Heritage Area are also a focus for research and defence training activities.

Islands in the World Heritage Area are important for tourism and recreation. An estimated 40 per cent of the 1.8 million tourists to the Reef in 2011 included an island destination in their visit (Deloitte Access Economics 2013). Magnetic Island, near Townsville, includes a

number of urban, village-type settlements wholly located within the World Heritage Area. While 27 islands have resorts and/or residential communities, only 14 resorts are currently open and functioning. The Program provides visitor infrastructure that supports tourism and recreational use of islands including 160 kilometres of walking tracks, 15 kilometres of road, 110 campgrounds and day use areas, and 21 lookouts and boardwalks. New or improved facilities have been proposed for high-use areas such as the Whitsundays. Key visitor values, as identified through the VBMF rollout to date, are provided in Appendix 4e.

2.2 Current Status of Island Systems on the Great Barrier Reef

In general, the condition of islands is assessed as good and stable, with the exception that condition is deteriorating on some inner islands that are the subject of development activities in the southern World Heritage Area (Great Barrier Reef Marine Park Authority 2014).

Nonetheless, there is a definite need for World Heritage Area managers to both maintain their vigilance and to be adequately resourced, given the magnitude of rising threats (including climate change effects) and an increasing need for further direct management intervention to counter these threats (Periodic Review 2017). The Periodic Review report particularly cautioned about the reality and risk of a serious continuing decline in Reef and island health without an appropriate level of investment in the Field Management Program.

Of the 1050 islands in the World Heritage Area, only 470 are protected as Commonwealth islands or Queensland national parks. Undertaking a tenure resolution process to further identify and acquire islands with high conservation or cultural values as national park, and further collaborating with other island owners and managers would enhance protection of their outstanding universal values (Periodic Review 2017).

3.0 Priority indicators to monitor islands on the Great Barrier Reef

Consistent with the broad range of natural, Indigenous cultural, historical, visitor use, economic and amenity values (amongst others) of World Heritage Area islands, a diversity of indicators need to be employed in the monitoring of island health and management effectiveness. Appendix 1 provides a summary of priority indicators as they relate to Reef 2050 Plan targets and key island values as identified under the VBMF. Particular attention is given to the type of monitoring tools employed, the scale of application, and justification or rationale for the use of the indicator.

While Appendix 1 is primarily values focussed, it also considers indicator and surveillance tools to support island biosecurity measures, including an evaluation of their effectiveness. Similarly Appendix 5a, 5b and 5c consider indicators important to Health Check monitoring as they relate to key natural, historic and visitor values, respectively.

Appendix 6 considers indicators that can be used to monitor island BioCondition, with particular attention given to the functional role of vegetation in biodiversity health and well-being.

The VBMF and complementary planning and management systems such as the FLAME Fire and Pest systems are supporting a more outcomes rather than just output focus in the development of management effectiveness indicators. For example, in the context of fire management performance indicators, managers are shifting away from reliance on primarily output focused measures (such as area burnt, or percentage of planned burns achieved), to additionally accommodate more outcome performance indicators (such as percentage of burns in prescription, or compliance of burns with identified zoning targets).

4.0 Evaluation of the adequacy of current monitoring of islands on the Great Barrier Reef

4.1 Synopsis of existing monitoring programs

The Values Based Management Framework (VBMF) provides the platform for the primary monitoring strategy for the islands of the World Heritage Area, particularly the national park islands. QPWS is now implementing the VBMF in a gradual rollout across island national parks, with initial attention afforded to priority parks.

The VBMF focusses management on the key values of each park. QPWS is now working to prepare all new management plans and statements for all parks consistent with the framework.

The VBMF has six key steps:

1. Plan: develop a plan or statement and thematic strategies based on key values and Levels of Service (LoS). Identifies how we will maintain or improve the condition of key values.
2. Prioritise: State-wide and regional and park priorities are determined to guide funding and management efforts.

3. Do the work: work is completed, guided by action plans within pest and fire strategies and directions set in other thematic strategies (visitor, cultural etc.).
4. Monitor: Health Checks conducted on key values to monitor/document their condition.
5. Evaluate: Park Review program assessing current performance against targets set in plans/statements and thematic strategies.
6. Report: Park Report Cards and State of Parks reports document condition of park key values and progress at park and state level. This info feeds into the next planning cycle, beginning again at Step 1.

All national parks in Queensland, including the World Heritage Area island parks, now have an overall Level of Service (LoS) predetermined (Refer to Appendix 2 for specific World Heritage Area island LoS).

There is also a separate LoS assigned to each of the nine different management elements relevant to each park (fire, pest, natural values etc.). The LoS assigned to the final two management elements ('field management capability' and 'operational planning and support') are also considered in the overall LoS for the park. Thus, for Hinchinbrook Island, the overall LoS is Exceptional; for Brook Islands, it is Medium. It is these overall LoS that determine the State-wide priority for each park.

The desired LoS were determined by a State-wide benchmarking process. This was a desk-top exercise confirmed by key external experts and QPWS staff. The desired LoS is what management plans, statements, strategies and action plans will aim to achieve.

During the initial values assessment process (commenced in 2017 and very much an ongoing process) the current LoS for each management element is determined for each park. This then sets the scene for management documents to guide how we get from where we are now (current LoS) to where we need to be (desired LoS).

Health Checks are an essential monitoring component of the VBMF (Appendix 5). In conjunction with routine assessment and Basic Performance Monitoring (Melzer 2013) of planned burn and pest management programs, Health Checks will be the basis for the evaluation of the condition of key values through time for the majority of estate managed by Queensland Parks and Wildlife Service (hereafter 'park' regardless of tenure) (Figure 1). As shown in Appendix 5, Health Checks is an important monitoring and assessment system for a range of key value types, not just key natural values.

Where highly significant values require management intervention on a high priority park, detailed, targeted monitoring may be warranted (Melzer 2015), and will be identified in the Assessment and Monitoring Strategy for that park (Source: internal QPWS *Monitoring*

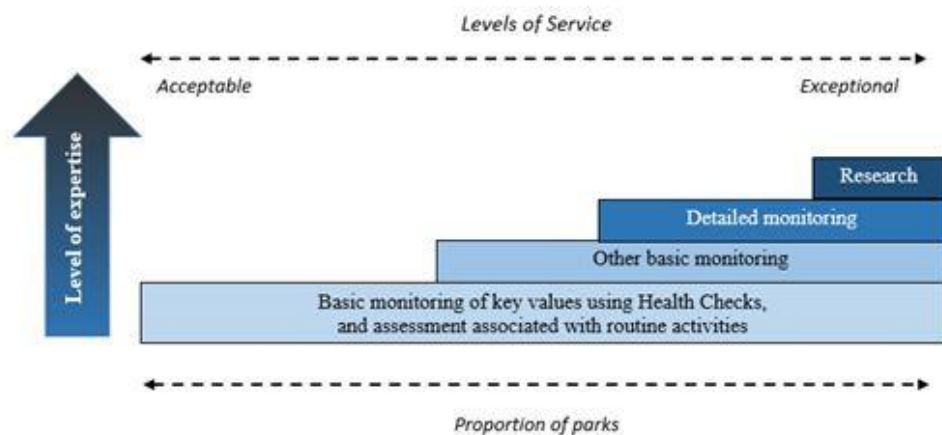


Figure 1: Levels of monitoring on park.

information sheet).

By way of summary, the various levels of monitoring for national park islands should ideally be as follows (see also Figure 2):

Health checks will be used to evaluate the condition of most key values identified through values assessment workshops. The health check uses simple, visual assessment 'cues' and requires no specialist skills or equipment.

Basic monitoring will be undertaken by park managers as part of their normal duties. Examples include mapping the distribution of a priority weed species and photo monitoring to assess pest animal impacts at a spring, to evaluate the effectiveness of control programs over time.

Detailed monitoring will be focused on high priority parks which require management action to protect or enhance significant values. Detailed monitoring is targeted, well designed, fit-for-purpose and adequately resourced. It is also scrutinised to ensure that data continues to be captured, analysed and used to inform management

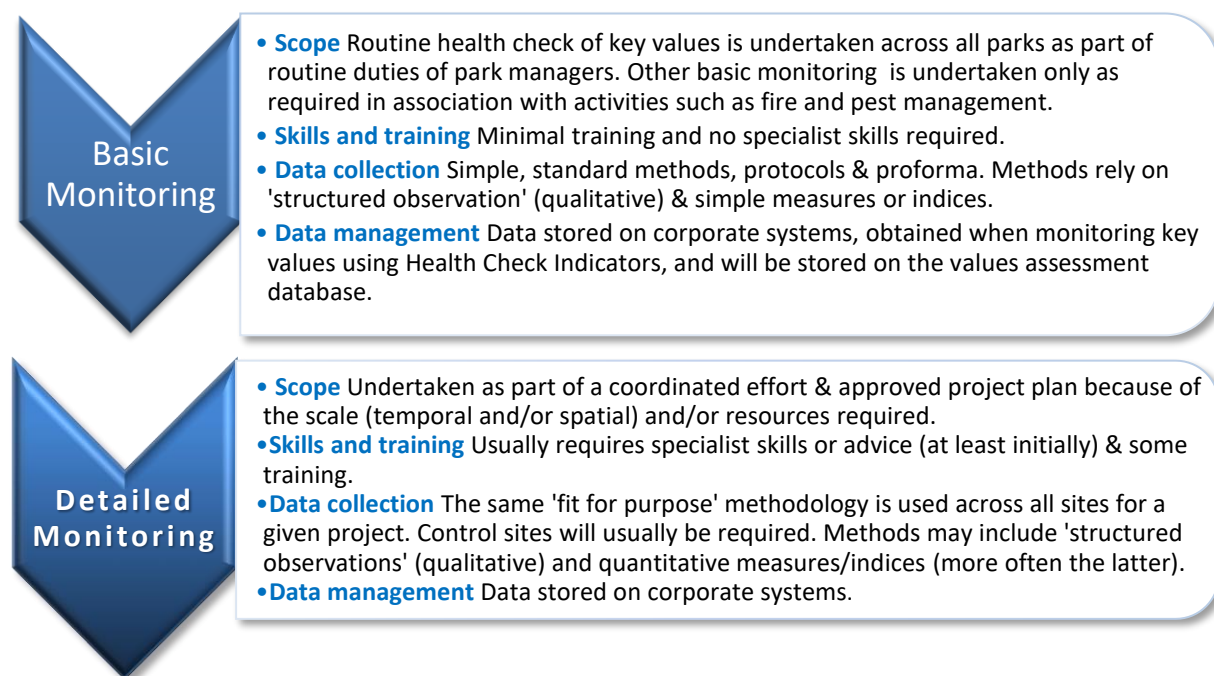


Figure 2: Comparison of Basic and Detailed Monitoring (source: internal QPWS Monitoring information sheet).

Condition and trend data captured by the VBMF will also be used to inform the proposed 5 yearly Queensland State of the Parks Report (QSOP). QSOP will highlight the range of park values that are managed as well the many issues that affect park condition. As an accountability tool, it will also highlight QPWS achievements as well as challenges.

QPWS rangers have also been using Island Watch as another island monitoring tool since 2015 (Appendix 7). Complementary to the more detailed and systematic Health Checks system, Island Watch is a stand-alone rapid assessment survey tool that serves as an early warning system by prompting rangers to check for change, particularly proving useful as a tool to assist the quarantine and early warning component of island biosecurity. However, Island Watch does not just focus on the early detection of emerging pests or other threats such as saltwater intrusion. It is also a useful rapid assessment tool for other indicators of island health such as the appearance or decline of seabird or turtle nesting sites. It is particularly designed to help rangers easily collect and keep track of observations made on routine visits to islands, especially the remote or seldom-visited ones.

While currently utilising a quick and easy paper-based format (Appendix 7), integration of Island Watch into the tablet-based Field Reporting System is underway, and will further enhance the data capture, storage, analysis and reporting potential of this monitoring tool. Delivery targets for Island Watch reports are currently identified in the Field Management

Program annual business plans, with enhanced rollout performance indicators anticipated over time.

The VBMF has also had significant influence on Island Biosecurity practice and procedures. A key element here has been the ongoing development and implementation of comprehensive island pest management strategies whose foundation is biosecurity – particularly moving towards a border protection focus to prevent new pest incursion and establishment (Appendix 8). For example, QPWS has developed LoS for island biosecurity to inform the level of biosecurity needed for all World Heritage Area islands based on their values, threats and risks from pests. Coupled with the development of practical quarantine, surveillance, and emergency response procedures, this both strategic and high profile Program approach has been highly successful in creating a strong cultural shift in biosecurity awareness and practice amongst rangers and support groups.

4.2 Adequacy of existing monitoring programs

Many of the natural resource management issues on islands result from the legacy of past activities. Consequently, effective management needs to address past impacts as well as current and emerging threats to the islands and their surrounding marine ecosystems (Great Barrier Reef Marine Park Authority 2014).

Key past and present impacts on the islands throughout the World Heritage Area are generally well understood and include: historical guano mining activities; invasive plants and animal pests (for example goats, rats); altered and unmanaged fire regimes; impacts from visitation; increasing impacts of industrial and residential infrastructure; the degradation of cultural heritage (Indigenous and historic); and the consequences of climate change, leading to declines in cultural, ecological and aesthetic values (Great Barrier Reef Marine Park Authority 2014).

While the Values Based Management Framework (VBMF) has been designed with an in-built monitoring strategy to track the condition of park values and efforts towards managing them (including addressing these past, present and emerging impacts and threats), the adequacy of the overall framework has yet to be assessed given it is still in its early stages of implementation. As noted in the previous section, early indications are highly favourable, with the VBMF reinforcing a stronger more strategic outcomes focused approach to island management within the Program. A further rollout of management plans or statements, Health Checks and the various thematic strategies (e.g. fire, pest, visitor, Indigenous cultural heritage and assessment and monitoring strategies) across a larger number of island national parks is required before a more comprehensive assessment of the VBMF and its monitoring components can be made. While all national parks have designated Levels of Service in place (Appendix 2), Health Checks have only been completed for Hinchinbrook Island and Raine Island. Hinchinbrook Island has been identified as a focus for VBMF rollout, and significant input has been given to developing fire, pest, visitor and assessment, and monitoring strategies. Once again, these strategies have not yet had sufficient implementation time to fully determine their adequacy.

Nonetheless, there is a strong management effectiveness culture within the Program. Even in these early stages particular attention is being given to evaluating the rollout and performance of the VBMF and other monitoring tools such as Island Watch and the Field Reporting System. For example, the annual POD natural resource management workshop reviews program delivery and feeds into annual business plan and reporting cycles. The POD remains a key Program mechanism for the ongoing implementation and evaluation of the VBMF and other monitoring, assessment and reporting tools.

While the extent of geographic application and rollout of all elements of the VBMF (including the Health Checks condition monitoring component) is in its early stages, early indications suggest that ongoing implementation of the VBMF (particularly when complemented by the rapid assessment Island Watch tool) will provide a monitoring framework adequate to meet current management needs, particularly for national park islands. Nonetheless, the logistical and resource challenges of managing such a large geographic spread of islands will always likely remain a significant challenge despite the efficacy of any overarching strategy. However, the VBMF, as previously noted, provides an invaluable tool in clearly identifying monitoring needs and priorities – an important element in itself, particularly when logistics and geography are significant constraints. Further, the VBMF has an underpinning adaptive management framework, with the capacity to adjust its focus as new or changing information or circumstances regarding islands come to hand.

The VBMF and Island Watch should continue to be considered for expansion, where possible, beyond national park islands.

The *Great Barrier Reef Region Strategic Assessment: Strategic assessment report* (Great Barrier Reef Marine Park Authority 2014) provides a broader independent assessment of island management effectiveness and the key issues affecting island health. The purpose of the report was to assess the adequacy of current World Heritage Area management to protect Matters of National Environmental Significance.

The following extract from the Strategic Assessment Report (page 9-16) considered island management effectiveness against six categories: Context, Planning, Inputs, Process, Outputs, and Outcomes. The report concluded that:

Context is mostly effective. Values underpinning matters of national environmental significance for islands are well documented and understood by managers, with management plans or management statements that articulate the values and threats for the islands developed. The geological basis of islands: mangrove islands, continental islands, and reef islands or coral cays influence the management issues associated with each island. Mapping of regional ecosystems and identification of endangered ecosystems has occurred for most islands. The islands vary significantly in their visitation and development profiles.

Planning is mostly effective. A range of planning processes are in place to manage the islands, and vary depending on the jurisdictional responsibilities. Plans include the Zoning Plan (including restricted access areas and public appreciation areas), local government planning, Queensland Parks and Wildlife Service management plans, Cairns, Whitsunday

and Hinchinbrook Plans of Management and Traditional Use of Marine Resources Agreements. Overall, the planning arrangements on islands to protect the values are in place, and are implemented appropriately.

Inputs are partially effective. Significant long-term financial commitments from both the Australian and Queensland governments are required if priority actions to achieve agreed objectives are to be implemented. This is particularly important for high value locations that are remote and difficult to access.

Process is mostly effective. Good governance through the intergovernmental agreement and joint management program, as well as strong stakeholder engagement is in place. Monitoring programs such as the coastal bird monitoring strategy, turtle monitoring, pest and weed programs, and specific vegetation programs such as the impact of the invasive ants in the *Pisonia* forests on Tryon Island are undertaken to assist management decisions and gauge the impact of management actions.

Outputs are mostly effective. Activities relating to island management have generally progressed well, and in accordance with the respective work programs, such as the Field Management Program. Examples include the successful eradication of feral pigs from Duck Island, and removal of rats from Boydong Island. Limited resourcing is seeing a reduction in time spend on remote and isolated islands, and it is expected that this will also impact on the capacity to deliver the work programs.

Outcomes are mostly effective. Management activities are reducing the short-term immediate risks and threats. However, they are not comprehensively addressing issues such as changes in beach profiles due to climate change and severe weather. **Biodiversity outcomes** are mostly effective. Specific actions to address the impacts of changes to beach profiles that affect high value biodiversity outcomes such as turtle breeding on Raine Island have been implemented. However, this has not been comprehensively considered across all islands.

The Strategic Assessment Report was developed at a time when the VBMF and island biosecurity measures were in their early stages of development and implementation. This report has contributed to island management effectiveness through providing a platform to focus outcome-based management activities on identified values. A more recent review of the management effectiveness of the actual Field Management Program itself (Periodic Review Report 2017) has also reinforced the Strategic Assessment Report assessment for the need for significant and long-term State and Commonwealth funding commitment.

4.3 Gaps in current monitoring effort

The key known threats to the natural, economic and social values of World Heritage Area islands are:

- the ecosystem consequences of a changing climate;
- invasive plant and animal pests;
- altered and unmanaged fire regimes;
- impacts to island natural and recreational values if human use is not well managed; and

- the degradation of cultural heritage (Indigenous and non-Indigenous) (Great Barrier Reef Marine Park Authority 2014).

While managers generally understand most of the potential threats to protected area island ecosystem integrity, the capacity to consistently monitor and report on island condition and trend and to plan response treatments strategically across the World Heritage Area is constrained. Improving the capability to monitor and report on the condition and trend of islands over the long term would support a complete adaptive management approach for islands and deliver more resilient island ecosystems. It would also complement the existing marine ecosystem condition and trend monitoring arrangements, providing a more holistic ecosystem assessment of the World Heritage Area.

QPWS has developed the Values Based Management Framework (outlined elsewhere in this report) to provide a strategic platform to address long-term monitoring, condition and trend reporting needs, at least initially for island national parks. To ensure a holistic approach to managing island values, it is important that effort in developing the VBMF suite of planning and monitoring tools gives equal attention to all identified key values including those aesthetic or cultural heritage based key values that fall outside of the, at times, more familiar natural resource or visitor management considerations.

Climate change amplifies the disturbance regime in natural systems, with no exception regarding impacts on island ecosystems. Predicting the impacts on islands over the next 25 years will be difficult; and the capacity to adapt management arrangements to respond to emerging issues or outbreaks is important.

Incomplete and inaccurate mapping information can pose a particular challenge to meaningful monitoring and assessment. For example, accurate fire management planning, monitoring and assessment can be impaired on some islands (in particular those that are remote or infrequently visited) where Fire Vegetation Groups and/or Regional Ecosystem mapping is limited, non-existent or known to be inaccurate (Appendix 3). QPWS is proposing to revise island mapping data gaps (particularly Regional Ecosystem and Fire Vegetation Groups) with the assistance of the Queensland Herbarium.

Further investment in strategic traditional owner partnerships, including the development of Indigenous cultural heritage management plans and strategies, will greatly assist in the appropriate and accurate identification of cultural values, and subsequently the development of agreed protocols and procedures to monitor, protect and enhance those values. Contemporary initiatives include the site-specific Raine Island Indigenous Cultural Heritage Management Plan and the more broadly focussed *Aboriginal and Torres Strait Islander Heritage Strategy for the Great Barrier Reef Marine Park*.

While there have been significant recent advances in quarantine and surveillance monitoring efforts, additional insights into how to better recognise impacts on island values and then to respond appropriately would be of great benefit to all island managers.

5.0 New technologies for monitoring islands on the Great Barrier Reef

Smart technologies, including utilisation of electronic field reporting (e.g. the tablet-based Field Reporting System), remote sensing (use of video and acoustic faunal monitoring systems on Raine Island and Michaelmas Cay), and the use of drones (Raine Island seabird surveys and topographic mapping), have improved understanding of Reef and island health (Periodic Review 2017).

Drone trials at Raine Island suggest the potential for more efficient and effective collection of data with topographic mapping and turtle and seabird counts completed in hours, rather than days or weeks. Smart seabird monitoring techniques are also currently being used to monitor seabirds, including acoustic recorders at Raine Island and Capricornia Cays (North West and East Fairfax Islands). While the logistics of maintaining sensitive remote monitoring equipment as well as the complexity of data analysis remains, at times, challenging further measured investment in acoustic monitoring is warranted given the early success of these trials. The Program is currently proposing to continue acoustic seabird monitoring trials at Raine and East Fairfax Islands, review the progress of the Capricorn Cays program annually, and expand drone trials to better determine resolution requirements, and investigate pairing drone and acoustic monitoring at selected island sites.

One of the challenges of applying new technologies for the range of island monitoring needs is the capacity to keep up with technological advances as well and having the time and resources available to undertake new equipment trials, including ensuring data retrieval and analysis is readily achievable and able to meaningfully inform management actions.

6.0 Recommendations for integrated monitoring of islands on the Great Barrier Reef

By its very nature, the VBMF provides a highly integrated and strategic approach to meeting island monitoring needs, amongst a broader suite of adaptive management activities. While the VBMF is in its early phase of implementation, early indications (including support from Program managers) indicate the ongoing establishment of a highly strategic, integrated and adaptive approach to monitoring, planning and on-ground management. It is designed to be adaptive to accommodate new information and changing circumstances, including an improved understanding of specific island values and the emergence of new threats or management opportunities. The VBMF is proposed to be expanded across key national park islands, following an agreed set of priorities (in part based on identified LoS). Resources permitting, further consideration could be given to expanding the VBMF beyond just protected area tenures to address other priority island needs.

The expansion of existing monitoring programs and the establishment of new monitoring partnerships also has the potential to enhance the scope and diversity of island monitoring. For example, a heightened Program emphasis on island biosecurity practice and procedures (including on community and industry awareness) in recent years (Appendix 8) has led to successful quarantine and surveillance partnerships with Traditional Owner ranger groups, resorts, research stations, and island transport suppliers (e.g. barge and air transport companies).

7.0 Assessment of the resources required to implement the recommended design

Ongoing rollout of the VBMF will serve to confirm the resources required to further implement and expand the framework. Current VBMF funding appears adequate for meeting early rollout targets.

There has also been significant investment by the Program to promoting the VBMF and other key 'checking for change' systems (e.g. Island Watch and island biosecurity quarantine and surveillance procedures) with a strong shift in thinking and practice amongst field staff towards more strategic monitoring and assessment.

Additional resources are also potentially available through philanthropic investment and collaborating with partners to fill knowledge gaps and monitor the condition and trend of islands, including particular species.

8.0 References

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9.0 Appendix 1 Island Levels of Service, values and indicators

Much of the content for Appendix 1 draws on the information collated to date through the Queensland Parks and Wildlife Service Values Based Management Framework (VBMF). Whilst focused on the protected area estate (island national parks) the approach used in the VBMF can be applied to all tenures. That is, the determination of: 1) key values, for an island or island group; 2) threats to those values; 3) the current and desired condition of each value; 4) the management actions/directions required to achieve or maintain the desired condition and; the means to evaluate management effectiveness including through monitoring programs. The VBMF is a ‘work in progress’ with 12 national parks having a Values Assessment (effectively 1-4 above documented) at March 2018. Components of Appendix 1, such as specific indicators and the ‘scale of application’, will be more fully informed as the VBMF dataset matures. There is also significant scope for improving our knowledge of the values and threats on islands through flora and fauna (vertebrate and invertebrate) surveys. These are not covered in Appendix 1.

The concept of Levels of Service (LOS), from the VBMF, is referred to in Appendix 1. LOS define management standards for QPWS estate. Their purpose is to align management effort with agreed priorities and deliver more consistent, transparent and effective management. LOS inform investment in park management and guide professional judgement with respect to how a park may be managed. They provide a framework to identify the existing and desired future standards for management. The LOS defined for national park islands is provided in Appendix 2.

Levels of Service are applied to **nine park management ‘elements’** for each park

1. **Fire management**
2. **Pest management**
3. **Natural values management**
4. **Indigenous cultural heritage management and engagement**
5. **Historic cultural heritage management**
6. **Community and commercial engagement**
7. **Visitor management**
8. **Field management capability**
9. **Operational planning and management support**

There are five Levels of Service:

Acceptable ⇒ Medium ⇒ High ⇒ Very High ⇒ Exceptional

Key to decision criteria (DC):

1. Tactical, early warning – informs incidence assessment and/or response
2. Operational – informs actions, assessments
3. Policy and planning
4. Evaluates management effectiveness
5. Condition and trend reporting
6. Important for process understanding, attribution
7. Important for data integration across themes
8. Continuity of historical data sets, building on existing programs

Reef 2050 and other management requirements [target/goal/outcome]	Indicator & examples of monitoring 'tools'	Scale of application (spatial)	Scale of application needed (temporal)	Justification for indicator i.e. rationale and previous evidence (also refer key to decision criteria DC)	Limitations/caveats to interpretation or applicability. Links to other themes
Key (ecosystem) Values identified through the QPWS Values Based Management Framework because of their significance (e.g. threatened or endemic ecosystems)					
Note: Regional Ecosystem (RE) mapping is not available for all islands. RE maps at a scale suitable for management purposes are needed, particularly for islands requiring fire management. Refer Appendix 3.					
2050 Outcome: The status and ecological functions of ecosystems within the World Heritage Area are in at least good condition with a stable to improving trend. 2035 Objective: EHO3 Trends in the condition of key island ecosystems are improved over each successive decade.	Distribution and extent e.g. 'tools': <ul style="list-style-type: none"> • remote sensing • drone technology 	General: Island NPs with identified Key (ecosystem) Values; mostly those island groups with LOS (Natural) of Very High to Exceptional (refer Appendix 2). Specific: Examples provided in Appendix 4a&b	5 years and after major disturbance events (e.g. cyclone, wildfire)	DC 1, 2, 4, 5, 6, 7	
	Condition e.g. 'tools' <ul style="list-style-type: none"> • Health Checks (refer Appendix 5a) • BioCondition (refer Appendix 6) • Targeted monitoring for threats/impacts such as inappropriate fire regimes, vertebrate & invertebrate pests & weeds. May be opportunities to link with Mangrove Watch	General: Local (i.e. specific ecosystems) on Island NPs with identified Key (ecosystem) Values; Health Checks are undertaken irrespective of LOS but detailed monitoring mostly focused on island groups with LOS (Natural) of Very High to Exceptional. Specific: <i>Pisonia grandis</i> ecosystems in Capricornia Cays NP & restoration site Lady Elliott Island Other specific examples provided in Appendix 4a&b	Health Checks – annual. Otherwise as determined through project planning (dependent on ecosystem dynamics & threats); 5 yearly likely to be a maximum.	DC 2, 4, 5, 6, 7, 8	Links to Human Dimension theme
				e.g. <i>Pisonia</i> forests are of international significance & RE12.2.21 is Of Concern. Decline/loss – aesthetic & recreational impacts & impacts on significant species (refer below)	

Reef 2050 and other management requirements [target/goal/outcome]	Indicator & examples of monitoring 'tools'	Scale of application (spatial)	Scale of application needed (temporal)	Justification for indicator i.e. rationale and previous evidence (also refer key to decision criteria DC)	Limitations/caveats to interpretation or applicability. Links to other themes
Key (ecosystem) Values identified through the QPWS Values Based Management Framework because of their importance as habitat for significant species					
<p>2050 Outcome: The status and ecological functions of ecosystems within the World Heritage Area are in at least good condition with a stable to improving trend.</p> <p>2035 Objective: EHO3 Trends in the condition of key island ecosystems are improved over each successive decade. 2035 Objective BO5 Reef habitats and ecosystems are managed to sustain healthy and diverse populations of indicator species across their natural range.</p>	<p>Distribution and extent e.g. 'tools':</p> <ul style="list-style-type: none"> • remote sensing • drone 	<p>General: Island NPs with identified Key (ecosystem) Values based on their importance as habitat; mostly those island groups with LOS (Natural) of Very High to Exceptional.</p> <p>Specific: Examples provided in Appendix 4c.</p>	5 years and after major disturbance events (e.g. cyclone, wildfire)	DC 2, 4, 5, 6, 7, 8	Links to megafauna theme (e.g. turtle, seabird nesting habitat distribution and extent)
	<p>Condition e.g. 'tools'</p> <ul style="list-style-type: none"> • Health Checks (refer Appendix 5a) • BioCondition (refer Appendix 6) • Targeted monitoring for threats/impacts such as vertebrate & invertebrate pests. • Targeted monitoring of the flora or fauna species relying on the habitat • Island Watch program (Appendix 7) may provide early warning of impacts or concerns. 	<p>General: Local (i.e. specific ecosystems) on Island NPs with identified Key (ecosystem) Values based on their importance as habitat; Health Checks are undertaken irrespective of LOS but detailed monitoring mostly focused on island groups with LOS (Natural) of Very High to Exceptional.</p>	Health Checks – annual. Otherwise as determined through project planning (dependent on ecosystem dynamics & threats); 5 yearly likely to be a maximum.	DC 1, 2, 4, 5, 6, 7, 8	Links to megafauna theme
		<p>Specific:</p> <ul style="list-style-type: none"> • <i>Pisonia grandis</i> ecosystems in Capricornia Cays NP • Raine Is. nesting habitat <p>For other specific examples refer Appendix 4c.</p>		<p>Loss or decline may threaten stability of the coral cays & critical seabird nesting habitat.</p> <p>Scale insect & pest ant outbreaks linked to major loss of ecosystem on Tryon Island.</p> <p>Natural predators (ladybirds, parasitic wasps) important for controlling scale outbreaks, together with ant control.</p>	

Reef 2050 and other management requirements [target/goal/outcome]	Indicator & examples of monitoring ‘tools’	Scale of application (spatial)	Scale of application needed (temporal)	Justification for indicator i.e. rationale and previous evidence (also refer key to decision criteria DC)	Limitations/caveats to interpretation or applicability. Links to other themes
Key Species Values					
<p>2050 Outcome: Biodiversity – the reef maintains its diversity of species and ecological habitats and these improve over each successive decade.</p> <p>2020 Target: BT5 Trends in populations of key indicator species and habitat condition are stable or improving at Reef-wide and regionally relevant scales.</p> <p>2035 Objective: BO5 Reef habitats and ecosystems are managed to sustain healthy and diverse populations of indicator species across their natural range.</p>	<p>Population survival, size, dynamics – of significant species (usually listed as significant under NCA, EPBC) and those whose status is an indicator of management effectiveness</p> <p>Monitoring ‘tools’ dependent on species biology, location, management questions.</p> <p>Island Watch program (Appendix 7) may provide early warning of impacts or concerns.</p>	<p>Local populations (island specific). Fauna examples include:</p> <ul style="list-style-type: none"> •Endangered Dawson yellow chat (Curtis Island NP) •Endangered northern quoll (Magnetic Is) •Vulnerable koala (South Cumberland Is NP & Magnetic) •Vulnerable common death adder, Endangered Proserpine rock-wallaby (Gloucester Is.) •Vulnerable Sadlers dwarf skink <i>Menetia sadleri</i> & Hinchinbrook Is. nursery-frog – both endemic to Hinchinbrook Is. <p>Flora examples include:</p> <ul style="list-style-type: none"> •Vulnerable <i>Berrya rotundifolia</i> endemic to Calder & Middle Percy Is. •Vulnerable blue banksia <i>plagiocarpa</i> endemic to Hinchinbrook Is. & nearby mainland <p>Regional or Reef-wide: e.g. turtles, coastal birds,</p>	As determined through project planning.	<p>DC 2, 4, 5, 6, 8</p> <p>Monitoring habitat alone is not adequate for determining the status/condition of populations of threatened, or otherwise significant, species. Habitat may appear healthy while population is in decline.</p>	<p>Links to megafauna theme.</p> <p>Fauna & flora values on many islands poorly known. Opportunity for greatly improving knowledge.</p>
Biosecurity (surveillance and quarantine components) (Refer Appendix 8 for further information on QPWS’ approach to biosecurity)					
<p>2050 Outcome: The status and ecological functions of ecosystems within the World Heritage Area are in at least good condition with a stable to improving trend.</p> <p>2050 Outcome: Biodiversity – the reef maintains its diversity of species and ecological habitats and these improve over each successive decade.</p> <p>2035 Objective: EHO3 Trends in the condition of key island ecosystems are improved over each successive decade.</p>	<p>Presence/abundance – of pests identified under ‘Prevention’ and/or ‘Containment’ in Pest Strategies such as high-risk invasive species (e.g. tramp ants, cane toads, Weeds of National Significance) and Restricted Biosecurity Matter (includes previously ‘declared’ pests).</p> <p>Monitoring tools for Targeted surveillance include, for example:</p> <ul style="list-style-type: none"> •James Cook University cane toad traps •Detection dogs •Light, malaise, pheromone traps •Pitfall traps •Bait stations •DNA (genetic sampling of skin, hair, scats etc.). <p>Monitoring tools for Opportunistic surveillance</p> <ul style="list-style-type: none"> •Health Checks •Island Watch •Bait stations •DNA (genetic sampling of skin, hair, scats etc.) 	<p>Targeted surveillance: High risk locations (e.g. barge landing areas on island or off-island sites servicing the island such as ship/barge-yards, wharves) at island NPs with High to Exceptional LOS for pest management and identified high biosecurity need.</p> <p>Opportunistic surveillance: As above plus island NPs with Adequate to Medium LOS for pest management and identified high biosecurity need.</p>	<p>Targeted surveillance: 1-5 yearly depending on location and pest biology, and/or as defined in Pest Strategy AND post major events that provide opportunities for pest invasion (e.g. infrastructure construction, cyclones, floods, wildfire)</p> <p>Opportunistic surveillance Opportunistically and as part of other monitoring and evaluation activities (e.g. Health Checks, Island Watch)</p>	DC 1, 2, 3, 4	

Reef 2050 and other management requirements [target/goal/outcome]	Indicator & examples of monitoring 'tools'	Scale of application (spatial)	Scale of application needed (temporal)	Justification for indicator i.e. rationale and previous evidence (also refer key to decision criteria DC)	Limitations/caveats to interpretation or applicability. Links to other themes
Geomorphology					
2050 Outcome: The status and ecological functions of ecosystems within the World Heritage Area are in at least good condition with a stable to improving trend.	+/- Change in geomorphology, sand budgets	Local (to address specific questions e.g. threat of sea level rise on Michaelmas and Upolu Cays NP) to reef wide.	For local: as determined through project planning. For Reef-wide: 1-5 yearly (at sufficient number of sites for representativeness for statistical support and inference at Reef wide).	Broad scale spatial assessment can only be inferred if sampling is probability based (i.e. every area has a defined probability of being selected in sampling regime)	Simple measure. Doesn't allow inference about condition or function, other than change over time. Also no cause for change directly inferable.
Key Indigenous Values					
2050 Outcome: Heritage – Indigenous and non-Indigenous heritage values are identified, protected, conserved and managed such that the heritage values maintain their significance for current and future generations.	Traditional Owner Connection to Country				Refer Indigenous Heritage working group
	Condition of physical sites •Components of current Historic Health Checks applicable (Appendix 5b); new version under consideration. •Targeted monitoring for threats/impacts on condition	Local sites as identified by Traditional Owners. For examples refer Appendix 4d.	Health Checks – annual. Otherwise as determined through project planning.	DC 1, 2, 4, 5, 7	Links to Indigenous Heritage theme
Key Historic (Shared) Values identified through the QPWS Values Based Management Framework					
2050 Outcome: Heritage – Indigenous and non-Indigenous heritage values are identified, protected, conserved and managed such that the heritage values maintain their significance for current and future generations.	Condition of physical sites: e.g. 'tools': • Health Checks (refer Appendix 5b) •Targeted monitoring for threats/impacts (e.g. weather events, weathering) on condition	Local (i.e. specific sites) identified as Key Values. Health Checks are undertaken irrespective of LoS but detailed monitoring mostly focused on island groups with LoS (Historic) of Very High to Exceptional. Refer Appendix 4d.	Health Checks – annual. Otherwise as determined through project planning.	DC 1, 2, 4, 5	Links to Human Dimension theme
Key Visitor Values as identified through the QPWS Values Based Management Framework					
2050 Outcomes: Community benefits – An informed community that plays a role in protecting the Reef for the benefits a healthy Reef provides for current and future generations. Economic benefits – Economic activities within the World Heritage Area and its catchments sustain the Reef's outstanding universal value.	Visitor experience – condition of visitor sites e.g. 'tools': •Health Checks (refer Appendix 5c) •Infrastructure audits & critical infrastructure assessments •Water quality monitoring •Sustainable Visitor Capacity protocol	Local (i.e. specific sites) identified as Key Values. Health Checks & mandatory infrastructure evaluations are undertaken irrespective of LOS. For examples refer Appendix 4e.	Health Checks – annual. Infrastructure assessment – annual to 3 years	DC 1, 2, 4, 5, 6	Links to Human Dimension theme
	Visitor experience – expectations met e.g. 'tools' •Stakeholder profiling •Visitor surveys •Sustainable Visitor Capacity protocol •Health Checks (inferred experience)	Local through to Reef-wide For examples refer Appendix 4e.	Health Checks – annual. Otherwise as determined through project planning & needs analysis.	DC 2, 3, 4, 5, 6, 7, 8	Links to Human Dimension theme

(Version August 2016)

ESTATE NAME	Fire	Pest	Natural	Historic culture	Community, partnerships and other interests	Visitor	Field Capacity	Op Planning & Support	Management Priority
Barnard Island Group National Park	Acceptable	Medium	High	Acceptable	Acceptable	Medium	Medium	Medium	Other
Bolger Bay Conservation Park	Acceptable	Acceptable	Acceptable	Acceptable	Medium	Medium	Medium	Medium	Other
Brampton Islands National Park	Acceptable	Medium	Medium	Acceptable	Medium	Medium	Medium	Medium	Other
Broad Sound Islands National Park	Acceptable	Medium	High	Acceptable	Acceptable	Acceptable	Medium	Medium	Other
Brook Islands National Park	Acceptable	Medium	High	Acceptable	Medium	Acceptable	Medium	Medium	Other
Cape Capricorn Conservation Park	Medium	Acceptable	Acceptable	High	Medium	Acceptable	Medium	Medium	Other
Capricornia Cays National Park	Acceptable	Very high	Exceptional	Acceptable	High	Exceptional	Very high	Very high	Priority
Claremont Isles National Park	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Other
Curtis Island Conservation Park	High	High	Very high	Medium	Medium	High	High	High	Other
Curtis Island National Park	High	High	Very high	High	Medium	High	High	High	Other
Denham Group National Park	Acceptable	Medium	Very high	Acceptable	Medium	Acceptable	Medium	Medium	Other
Family Islands National Park	Acceptable	Medium	High	High	High	Very high	High	High	Other
Fitzroy Island National Park	Medium	Acceptable	Medium	High	High	Very high	High	High	Other
Flinders Group National Park (Cape York Peninsula Aboriginal Land)	Acceptable	Acceptable	High	High	Acceptable	Medium	Medium	Medium	Other
Frankland Group National Park	Acceptable	Medium	Acceptable	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Other
Garden Island Conservation Park	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Other
Gloucester Island National Park	Medium	Medium	Very high	Acceptable	Medium	Medium	Medium	Medium	Other
Goold Island National Park	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Medium	Medium	Medium	Other
Green Island National Park	Acceptable	Acceptable	Acceptable	Acceptable	Very high	Exceptional	High	High	Priority
Hinchinbrook Island National Park	Medium	Medium	Very high	Medium	High	Exceptional	Exceptional	Exceptional	Iconic
Holbourne Island National Park	Acceptable	Medium	High	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Other
Hope Islands National Park	Acceptable	Acceptable	Medium	Medium	Acceptable	Medium	Medium	Medium	Other
Horseshoe Bay Lagoon Conservation Park	Medium	Acceptable	High	Acceptable	Acceptable	Medium	Medium	Medium	Other
Howick Group National Park (Cape York Peninsula Aboriginal Land)	Acceptable	Acceptable	medium	Medium	Acceptable	Acceptable	Medium	Medium	Other
Keppel Bay Island National Park	Medium	Medium	Very high	Acceptable	Medium	High	High	High	Other
Lindeman Islands National Park	Medium	Medium	High	Acceptable	High	High	Medium	Medium	Other
Lizard Island National Park	Medium	Medium	Medium	Exceptional	Very high	Very high	High	High	Other

ESTATE NAME	Fire	Pest	Natural	Historic culture	Community, partnerships and other interests	Visitor	Field Capacity	Op Planning & Support	Management Priority
Ma'alpiku Island National Park (Cape York Peninsula Aboriginal Land)	Acceptable	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Medium	Medium	Other
Magnetic Island National Park	Very high	High	High	Very high	Medium	Very high	Very high	Very high	Priority
Marpa National Park (Cape York Peninsula Aboriginal Land)	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Medium	Medium	Other
Michaelmas and Upolu Cays National Park	Acceptable	Acceptable	High	Acceptable	Medium	High	Medium	Medium	Other
Middle Percy Island Conservation Park	Medium	Medium	Medium	High	High	High	Medium	Medium	Other
Mitirinchí Island National Park (Cape York Peninsula Aboriginal Land)	Acceptable	Acceptable	High	Acceptable	Acceptable	Acceptable	Medium	Medium	Other
Molle Islands National Park	High	Acceptable	Medium	Acceptable	Very high	Very high	Medium	Medium	Other
Newry Islands National Park	Medium	Acceptable	Medium	Medium	Medium	High	Medium	Medium	Other
Northumberland Islands National Park	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Other
Orpheus Island National Park	Medium	Medium	Medium	Acceptable	Medium	Medium	Medium	Medium	Other
Percy Isles National Park	Medium	Medium	Medium	High	High	High	Medium	Medium	Other
Piper Islands National Park (Cape York Peninsula Aboriginal Land)	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Acceptable	Medium	Medium	Other
Possession Island National Park	Acceptable	Acceptable	High	High	Acceptable	Acceptable	Medium	Medium	Other
Raine Island National Park (Scientific)	Acceptable	Very high	Exceptional	Exceptional	Very high	N/A	Very high	Very high	Priority
Repulse Islands National Park	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Other
Round Island Conservation Park	Acceptable	Acceptable	Acceptable	High	Medium	Acceptable	Medium	Medium	Other
Sandbanks National Park	Acceptable	Acceptable	High	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Other
Saunders Islands National Park	Acceptable	Acceptable	Medium	High	Acceptable	Acceptable	Acceptable	Acceptable	Other
Sir Charles Hardy Group National Park	Acceptable	Acceptable	Medium	High	Medium	Acceptable	Acceptable	Medium	Other
Smith Islands National Park	Medium	Medium	Acceptable	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Other
South Cumberland Islands National Park	Medium	Medium	High	Acceptable	Medium	Medium	Medium	Medium	Other
Southend Conservation Park	High	High	Very high	Medium	Medium	High	High	High	Other
Swain Reefs National Park	Acceptable	Medium	Very high	Acceptable	Acceptable	Acceptable	Medium	Medium	Other
Three Islands Group National Park	Acceptable	Acceptable	Medium	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Other
Turtle Group National Park	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Other
Whitsunday Islands National Park	Medium	Medium	High	Medium	Very high	Exceptional	Exceptional	Exceptional	Iconic
Wild Cattle Island National Park	Medium	Acceptable	Medium	Acceptable	Medium	Medium	Medium	Medium	Other

ESTATE NAME	Fire	Pest	Natural	Historic culture	Community, partnerships and other interests	Visitor	Field Capacity	Op Planning & Support	Management Priority
Wuthara Island National Park (Cape York Peninsula Aboriginal Land)	Acceptable	Medium	Medium	Medium	Acceptable	Acceptable	Medium	Medium	Other
Yuwi Paree Toolkoon National Park	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Other

11.0 Appendix 3 Islands with no regional ecosystem mapping – priority for mapping

The table below lists islands with no regional ecosystem mapping. It does not include islands for which the scale of the regional ecosystem mapping is unsuitable for management purposes. 1 = highest priority for mapping.

Estate Name	Island Name	Regional Ecosystem mapped?	2018 Mapping Priority	Priority reason
Barnard Island Group National Park	Hutchison Island (17-043a)	yes 2019	1	high value for tourism and seabirds
Barnard Island Group National Park	Jessie Island (17-043c)	yes 2019	1	high value for tourism and seabirds
Barnard Island Group National Park	Sisters Island (17-046b)	yes 2019	1	high value for tourism and seabirds
Barnard Island Group National Park	Stephens Island (17-046a)	yes 2019	1	high value for tourism and seabirds
Barnard Island Group NP - CW	Kent Island (17-043d)	yes 2019	1	high value for tourism and seabirds
Broad Sound Islands National Park	Allandale Island (21-424)	no	3	
Broad Sound Islands National Park	Berwick Island (21-431)	no	3	
Broad Sound Islands National Park	Channel Island (21-377)	no	3	
Broad Sound Islands National Park	Eagle Islet (21-423c)	no	3	
Broad Sound Islands National Park	Eliza Island (22-052c)	no	3	
Broad Sound Islands National Park	Five Trees Cay (No 1) (22-051a)	no	3	
Broad Sound Islands National Park	Five Trees Cay (No 2) (22-051b)	no	3	
Broad Sound Islands National Park	Five Trees Cay (No 3) (22-051c)	no	3	
Broad Sound Islands National Park	Holt Island (22-045)	no	3	
Broad Sound Islands National Park	Long Island (No 1) (22-019c)	no	3	cultural values
Broad Sound Islands National Park	Low Island (22-037)	no	3	
Broad Sound Islands National Park	Morkar Islet (21-421)	no	3	
Broad Sound Islands National Park	Morpeth Island (21-430)	no	3	
Broad Sound Islands National Park	Mumford Island (No 1) (22-042a)	no	3	
Broad Sound Islands National Park	Mumford Island (No 2) (22-042b)	no	3	
Broad Sound Islands National Park	Rothbury Island (22-070a)	no	3	
Broad Sound Islands National Park	Tweed Island (22-069)	yes 2019	1	May require fire. Grasslands
Broad Sound Islands National Park	U/N Island (22-070b)	no	3	
Broad Sound Islands National Park (rock beside High Peak Island)	U/N Rock (21-428d)	no	3	
Broad Sound Islands National Park (within island group)	Annie Islet (22-052a)	no	3	
Broad Sound Islands National Park (within island group)	Collins Island (22-052b)	no	3	
Broad Sound Islands National Park (within island group)	Collins Reef (22-052)	no	3	
Broad Sound Islands National Park (within island group)	Coquet Island (21-417)	no	3	
Broad Sounds - Defence, not NP	Pelican Rock Reef (22-074)	no	3	
Cape Melville - CW	U/N Island (14-038c)	no	3	
Cape York Peninsula - Not NP	Lowrie Islet (13-045)	no	3	
Capricornia Cays National Park	Broomfield Cay (U/N) Cay (23-048)	no	3	
Claremont Isles National Park	Burkitt Island (13-111)	yes 2019	1	>30ha
Claremont Isles National Park	Fife Island (13-081)	no	3	
Claremont Isles National Park	Pelican Island (13-107)	yes 2019	1	QPWS seabird survey island
Claremont Isles NP - CW	Hannah Island (13-097)	yes 2019	1	>30ha
Family Islands National Park	Bowden (Budg-Joo) Island (18-005b)	no	3	
Family Islands National Park	Coombe Island (18-004)	yes 2019	1	>30ha, high NVs likely as per nearby Dunk island
Family Islands National Park	Hudson (Coolah) Island (18-006)	yes 2019	1	>30ha, high NVs likely as per nearby Dunk island

Estate Name	Island Name	Regional Ecosystem mapped?	2018 Mapping Priority	Priority reason
Family Islands National Park	Mound (Purtaboi) Island (17-053a)	no	3	
Family Islands National Park	Mung-um-gnackum Island (17-053c)	no	3	
Family Islands National Park	Smith (Kurrumbah) Island (18-005a)	no	3	
Family Islands National Park	Wheeler (Toolgbar) Island (18-003)	yes 2019	1	>30ha, high NVs likely as per nearby Dunk island
Family Islands National Park (within island group)	Pee-Rahm-Ah Island (18-001b)	no	3	
Flinders Group (not NP) (within island group)	Davie Cay U/N cay (13-130)	no	1	QPWS seabird survey island
Flinders Group (not NP) (within island group)	Tydemman Cay U/N cay (13-133)	no	1	QPWS seabird survey island
Frankland Group National Park	High Island (17-009)	yes 2019	1	>30ha
Frankland Group National Park	Normanby Island (17-012a)	yes 2019	1	high tourism site, pest work- ants
Frankland Group National Park	U/N Island (17-012b)	no	3	
Frankland Group National Park	U/N Island (17-013f)	no	3	
Frankland Group National Park (within island group)	Russell Island (17-013a)	yes 2019	1	high tourism site
Gloucester Island National Park	Low Island (20-029)	no	3	
Gloucester Island National Park	U/N Island (20-027)	no	3	
Green Island National Park	Green Island (16-049)	yes 2019	1	RAM island, very high tourism
Hinchinbrook Island National Park	Eva Island (18-013b)	no	2	Iconic NP
Hope Islands National Park	Hope Islands (East) (15-065)	no	3	
Hope Islands National Park	Hope Islands (West) (15-064)	no	3	
Hope Islands NP - CW	Low Island (16-028a)	no	3	
Howick Group National Park	Beanley Island (No 2) (14-064c)	no	3	
Howick Group National Park	Beanley Island (No 4) (14-064e)	no	3	
Keppel Bay Islands National Park	Barren (A-rum-mi) (First Lump) Island (23-031)	yes 2019	1	scientific value, may require fire
Keppel Bay Islands National Park	Divided Island (No 1) (23-023a)	no	3	
Keppel Bay Islands National Park	Divided Island (No 2) (23-023b)	no	3	
Keppel Bay Islands National Park	Flat Island (22-153)	yes 2019	2	
Keppel Bay Islands National Park	Hummocky Island (23-036)	yes 2019	1	May require fire. Grasslands
Keppel Bay Islands National Park	Pleasant (Conical) Island (23-002b)	no	3	
Lindeman Islands National Park	Baynham Island (20-091)	no	3	
Lindeman Islands National Park	Dead Dog Island (20-234b)	no	3	
Lindeman Islands National Park	Volksow Island (20-231)	no	3	
Lizard Island National Park	Seabird Islet (14-116d)	no	3	
Ma'alpiku Island National Park (Cape York Peninsula Aboriginal Land)	Restoration Island (12-078)	no	3	
Marpa National Park (Cape York Peninsula Aboriginal Land)	Errewerrpinha Island (prev Cliff Islands (West No 2) (14-012b)	yes 2019	1	very high cultural value, CYPAL
Marpa National Park (Cape York Peninsula Aboriginal Land)	Olilu Island (prev Cliff Islands (East) (14-013)	yes 2019	1	very high cultural value, CYPAL
Marpa National Park (Cape York Peninsula Aboriginal Land)	Ronhangu Island (prev Cliff Islands (West No 1) (14-012a)	yes 2019	1	Grassy, wildfire history, very high cultural value, CYPAL
Northumberland Islands National Park	Dinner Island (21-339)	no	3	
Northumberland Islands National Park	Penn Islet (21-051)	no	3	

Estate Name	Island Name	Regional Ecosystem mapped?	2018 Mapping Priority	Priority reason
Northumberland Islands National Park	Renou Islet (21-037)	no	3	
Northumberland Islands National Park	Still Islet (21-047)	no	3	
Orpheus Island National Park	Albino Rock (18-057)	no	3	
Percy Isles National Park	Boat Islet (21-395)	no	3	
Percy Isles National Park	Hixson Islet (21-402)	no	3	
Percy Isles National Park	Howard Islet (21-401)	no	3	
Percy Isles National Park	Middle Island (21-389)	no	1	management complexity, requires fire
Percy Isles National Park	North East Island (21-394a)	no	1	>30ha, probably requires fire
Percy Isles National Park	Pine Islets (No 1) (21-391a)	no	3	
Percy Isles National Park	Pine Islets (No 2) (21-391b)	no	3	
Percy Isles National Park	Pine Islets (No 4) (21-391d)	no	3	
Percy Isles National Park	Sphinx Reef (21-387)	no	3	
Percy Isles National Park	U/N Rock (21-387b)	no	3	
Percy Isles National Park	Vernon Rocks (No 1) (21-058a)	no	3	
Percy Isles National Park	Vernon Rocks (No 2) (21-058b)	no	3	
Percy Isles National Park	Walter Island (21-392)	no	2	>30ha
Percy Isles NP CW	Pine Islets (No 3) (21-391c)	no	1	Whole group is unmapped. May need fire.
Raine Island National Park (SCI)	Moulter Cay (11-130)	yes 2019	1	exceptional natural values - turtles and seabirds, cay veg and Lepturus
Round Island Conservation Park	Booby Island	no	2	high cultural value, QPWS seabird survey island
Sandbanks National Park	Sand Bank No 7 (13-061)	no	3	
Sandbanks National Park	Sand Bank No 8 (13-056)	no	3	
Smith Islands National Park	Anchorsmith Island (20-241)	no	3	
Smith Islands National Park	Anvil Island (20-243)	no	3	
Smith Islands National Park	Bellows Island (20-250)	no	3	
Smith Islands National Park	Blackcombe Island (20-242)	no	3	
Smith Islands National Park	Pincer Island (20-239)	no	3	
Smith Islands National Park (within island group)	Coppersmith Rock (No 1) (20-407a)	yes 2019	1	
South Cumberland Islands National Park	Bushy Islet (20-310a)	yes 2019	1	Has pure stands of Pisonia
Whitsunday Islands National Park	Arkhurst Island (20-801)	no	3	
Whitsunday Islands National Park	Bird Island (20-019a)	no	3	
Whitsunday Islands National Park	Black Island (20-017)	no	3	
Whitsunday Islands National Park	Buddibuddi Island (20-075b)	no	3	
Whitsunday Islands National Park	Esk Island (20-070)	no	3	
Whitsunday Islands National Park	Gungwiya Island (20-078c)	no	3	
Whitsunday Islands National Park	Ireby Island (20-071)	no	3	
Whitsunday Islands National Park	Langford Island (No 2) (20-019b)	no	3	
Whitsunday Islands National Park	Nunga Island (20-082b)	no	3	
Whitsunday Islands National Park	Plum Pudding Island (20-409)	no	3	
Whitsunday Islands National Park	Sillago Island (20-072)	no	3	
Whitsunday Islands National Park	Surprise Rock (20-083)	no	3	
Whitsunday Islands National Park	U/N Rock (20-075)	no	3	
Whitsunday Islands National Park	Wirrainbeia Island (20-073)	no	3	

12.0 Appendix 4 Key Natural Values (ecosystems) identified through the QPWS Values Based Management Framework because of their significance (e.g. threatened or endemic ecosystems)

Note: These are examples based on the national park islands for which a values assessment has been undertaken as part of the VBMF. The list will grow as more assessments are completed.

Reserve	Value Category	Value Name	Description	Significance	Significance class
Capricornia Cays NP	Ecosystems and Biodiversity	<i>Pisonia grandis</i> forests	<i>Pisonia grandis</i> is a woody tree found almost exclusively on small Indo-Pacific islands between the tropics of Cancer and Capricorn. Globally, pisonia forests have largely been cleared for guano mining and plantation agriculture. About 80% of Australia's <i>Pisonia grandis</i> forests occur on the Capricornia Cays, an internationally significant area for the species	National	Of concern
Capricornia Cays NP	Ecosystems and Biodiversity	Coral cay vegetation	The Capricornia Cays are oceanographically isolated and may be biologically distinct from rest of GBR. As the southernmost cays in the GBR, they are a refuge for 11 coral cay plant species at the southern limit for their distribution.	State	Of concern
Curtis Is. NP	Ecosystems and Biodiversity	Rainforest	Microphyll/notophyll vine forest on beach ridges are 'endangered' (RE 12.2.2) and semi-evergreen vine thickets are 'of concern' ecosystems (RE 12.11.4). Vine forest/vine thicket rainforests are nationally uncommon vegetation communities.	National	Critically endangered
Curtis Is. NP	Ecosystems and Biodiversity	Headland communities	The headlands on the east coast of Curtis Island with their steeply dipping and contorted bedding of rock and high energy wave-cut rock platforms are considered important geologic features. This cliff coastline also supports significant vegetation communities that are found only on Curtis Island.	State	Of concern
Curtis Is. NP	Ecosystems and Biodiversity	Beach Ridge communities	The beach ridge communities on Curtis Island are considered outstanding examples of this type of landform with communities that are intact and in good condition.	State	Of least concern
Curtis Is. NP	Ecosystems and Biodiversity	Alluvial eucalypt forests and woodlands	<i>Eucalyptus tereticornis</i> and <i>E. moluccana</i> dominated forest and woodland communities on alluvium are endangered (RE 12.3.3, 12.3.3b) and of concern ecosystems (RE 12.3.11).	National	Endangered
Fitzroy Is. NP	Ecosystems and Biodiversity	Corymbia intermedia (pink bloodwood) open forest	<i>Corymbia intermedia</i> and/or <i>C. tessellaris</i> ± <i>Eucalyptus tereticornis</i> medium to tall open forest to woodland (or vine forest with these species as emergents) on coastal granite and rhyolite headlands and near-coastal foothills. Habitat for coastal sheath-tail bat, <i>Taphozous australis</i> and a ground orchid, <i>Spathoglottis paulinae</i> .	State	Endangered
Fitzroy Is. NP	Ecosystems and Biodiversity	Rainforest (low notophyll vine forest/thicket)	Low notophyll vine forest and thicket. Exposed rocky coastal headlands. Listed as critically endangered under the EPBC Act. Littoral rainforest and coastal vine thickets of eastern Australia.	National	Critically endangered
Green Is. NP	Ecosystems and Biodiversity	Coral cay communities – closed vine forest	Green Island is the most floristically diverse of all coral cays in the Cairns and Central sections of the Great Barrier Reef Marine Park. Green Island supports a closed vine forest which is similar in species composition to vine forests found on the adjacent mainland, with 134 plant species identified.	National	Vulnerable
Hinchinbrook Is. NP	Ecosystems and Biodiversity	Rainforest	About 10 per cent of the park is rainforest, ranging from small pockets on the cloud covered peaks, down to the coastal lowlands. Several types of rainforest only grow in the park. Rainforest thickets, with hickory boxwood and northern brown pine (RE 7.12.49) occur in protected gullies which flank the southern granite mountains. A mosaic of clumps of rainforest, shrubland and open woodland occur on aeolian (wind-blown) sand dunes (RE 7.2.6, including the critically endangered subtype RE 7.2.6b), particularly on the large 'dune field' west of Ramsay Bay	International	World Heritage
Hinchinbrook Is. NP	Ecosystems and Biodiversity	Eucalypt forests and woodlands	Large areas of woodland and forest communities, dominated by Eucalyptus and Corymbia species, grow between the park's mid-slopes and wet lowlands or alluvial flats—mixing with melaleuca on swampier margins. The mix of species and forest height varies with geology, topography and aspect.	State	Endangered

Reserve	Value Category	Value Name	Description	Significance	Significance class
Hinchinbrook Is. NP	Ecosystems and Biodiversity	Heathland, shrubland, and cypress communities	Extensive areas of heathland and shrubland grow on the often cloud-covered high mountain peaks, ridges and rocky granite pavements and escarpments. Different types of heaths and shrublands often intertwine in a ‘mosaic’—including ecosystems only found on the park and dominated by northern brown pine <i>Podocarpus grayae</i> , black cypress <i>Callitris endlicheri</i> , brown salwood <i>Acacia celsa</i> , grass tree <i>Xanthorrhoea</i> spp. and Black sheoak <i>Allocasuarina littoralis</i> . Mountain top heath and scrub hosts Blue banksia <i>Banksia plagiocarpa</i> , which only grows on the island and the nearby mainland.	International	World Heritage
Hinchinbrook Is. NP	Ecosystems and Biodiversity	Wetlands	Vast and luxuriant mangrove forests fringe parts of the park—particularly at Missionary Bay (20 km ²) and Hinchinbrook Channel (164 km ²)—sustained by high rainfall, a tropical climate and a sheltered coastline.	International	World Heritage
Magnetic Is. NP	Ecosystems and Biodiversity	Mixed low woodland to shrubland	Mixed low woodland to shrubland on igneous rocks. Coastal hills, habitat for koala, <i>Phascolarctos cinereus</i> and northern quoll <i>Dasyurus hallucatus</i> .	International	World Heritage
Magnetic Is. NP	Ecosystems and Biodiversity	Rainforest (semi-evergreen vine thicket)	Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions.	International	World Heritage
Magnetic Is. NP	Ecosystems and Biodiversity	Hoop pines on boulder strewn slopes	<i>Araucaria cunninghamii</i> woodland or open forest on igneous rocks, coastal hills.	International	World Heritage

12.1 Appendix 4a Endangered regional ecosystems (RE) on national park islands

Estate	RE	Biodiversity status	Short Description
Brampton Islands NP	8.1.4	Endangered	Schoenoplectus subulatus and/or Eleocharis dulcis sedgeland or Paspalum vaginatum tussock grassland
Broad Sound Islands NP	8.1.4	Endangered	Schoenoplectus subulatus and/or Eleocharis dulcis sedgeland or Paspalum vaginatum tussock grassland
Broad Sound Islands NP	8.1.5	Endangered	Melaleuca spp. and/or Eucalyptus tereticornis and/or Corymbia tessellaris woodland with a ground stratum of salt tolerant grasses and sedges, usually in a narrow zone adjoining tidal ecosystems
Broad Sound Islands NP	8.2.2	Endangered	Semi-evergreen microphyll vine thicket to vine forest, on coastal dunes
Broad Sound Islands NP	8.2.9	Endangered	Tussock grassland on coastal dunes
Brook Islands NP	7.2.2	Endangered	Notophyll to microphyll vine forest on sands of beach origin
Brook Islands NP	7.2.7	Endangered	Casuarina equisetifolia +/- Corymbia tessellaris open forest +/- groved vine forest shrublands on strand and foredunes
Brook Islands NP	7.3.10	Endangered	Simple-complex mesophyll to notophyll vine forest on moderately to poorly-drained alluvial plains of moderate fertility
Curtis Island CP	12.2.2	Endangered	Microphyll/notophyll vine forest on beach ridges
Curtis Island CP	12.3.3	Endangered	Eucalyptus tereticornis woodland on Quaternary alluvium
Curtis Island NP	12.2.2	Endangered	Microphyll/notophyll vine forest on beach ridges
Curtis Island NP	12.3.3	Endangered	Eucalyptus tereticornis woodland on Quaternary alluvium
Curtis Island SF	12.2.2	Endangered	Microphyll/notophyll vine forest on beach ridges
Curtis Island SF	12.3.3	Endangered	Eucalyptus tereticornis woodland on Quaternary alluvium
Denham Group NP	3.2.28	Endangered	Semi-deciduous notophyll vine forest on beach ridges, coral atolls, shingle cays and sand cays
Family Islands NP	7.12.23	Endangered	Corymbia intermedia and/or C. tessellaris +/- Eucalyptus tereticornis, open forest to tall open forest to woodland (or vine forest with these species as emergents) on coastal granite and rhyolite headlands and near-coastal foothills
Family Islands NP	7.12.5	Endangered	Eucalyptus pellita +/- Corymbia intermedia open forest, or Acacia mangium and Lophostemon suaveolens open forest, (or vine forest with these species as emergents), on granite and rhyolite
Fitzroy Island NP	7.12.23	Endangered	Corymbia intermedia and/or C. tessellaris +/- Eucalyptus tereticornis, open forest to tall open forest to woodland (or vine forest with these species as emergents) on coastal granite and rhyolite headlands and near-coastal foothills

Estate	RE	Biodiversity status	Short Description
Fitzroy Island NP	7.2.7	Endangered	Casuarina equisetifolia +/- Corymbia tessellaris open forest +/- groved vine forest shrublands on strand and foredunes
Gloucester Island NP	8.2.2	Endangered	Semi-evergreen microphyll vine thicket to vine forest, on coastal dunes
Gloucester Island NP	8.2.9	Endangered	Tussock grassland on coastal dunes
Gloucester Island NP	8.3.5	Endangered	Eucalyptus platyphylla and/or Lophostemon suaveolens and/or Corymbia clarksoniana woodland on alluvial plains
Goold Island NP	7.12.23	Endangered	Corymbia intermedia and/or C. tessellaris +/- Eucalyptus tereticornis, open forest to tall open forest to woodland (or vine forest with these species as emergents) on coastal granite and rhyolite headlands and near-coastal foothills
Goold Island NP	7.12.60	Endangered	Melaleuca viridiflora +/- Corymbia clarksoniana +/- Eucalyptus platyphylla woodland to open forest on granite and rhyolite
Hinchinbrook Island NP	7.1.3	Endangered	Schoenoplectus subulatus and/or Eleocharis dulcis sparse sedgeland, or Melaleuca quinquenervia low open forest, in swamps which fluctuate periodically between freshwater and estuarine
Hinchinbrook Island NP	7.12.22	Endangered	Eucalyptus resinifera +/- E. portuensis +/- Syncarpia glomulifera tall open forest to tall woodland (or vine forest with these species as emergents) of granite and rhyolite uplands and highlands
Hinchinbrook Island NP	7.12.23	Endangered	Corymbia intermedia and/or C. tessellaris +/- Eucalyptus tereticornis, open forest to tall open forest to woodland (or vine forest with these species as emergents) on coastal granite and rhyolite headlands and near-coastal foothills
Hinchinbrook Island NP	7.12.4	Endangered	Syncarpia glomulifera +/- Eucalyptus pellita open forest of granites and rhyolites on deep soils
Hinchinbrook Island NP	7.12.5	Endangered	Eucalyptus pellita +/- Corymbia intermedia open forest, or Acacia mangium and Lophostemon suaveolens open forest, (or vine forest with these species as emergents), on granite and rhyolite
Hinchinbrook Island NP	7.12.60	Endangered	Melaleuca viridiflora +/- Corymbia clarksoniana +/- Eucalyptus platyphylla woodland to open forest on granite and rhyolite
Hinchinbrook Island NP	7.2.1	Endangered	Mesophyll vine forest on beach ridges and sand plains of beach origin
Hinchinbrook Island NP	7.2.2	Endangered	Notophyll to microphyll vine forest on sands of beach origin
Hinchinbrook Island NP	7.2.7	Endangered	Casuarina equisetifolia +/- Corymbia tessellaris open forest +/- groved vine forest shrublands on strand and foredunes
Hinchinbrook Island NP	7.2.8	Endangered	Melaleuca leucadendra open forest to woodland on sands of beach origin
Hinchinbrook Island NP	7.2.9	Endangered	Melaleuca quinquenervia shrubland to closed forest, or Lepironia articulata open to closed sedgeland, on dune swales and swampy sand plains of beach origin
Hinchinbrook Island NP	7.3.10	Endangered	Simple-complex mesophyll to notophyll vine forest on moderately to poorly-drained alluvial plains of moderate fertility
Hinchinbrook Island NP	7.3.12	Endangered	Mixed eucalypt open forest to woodland, dominated by Eucalyptus tereticornis and Corymbia tessellaris +/- Melaleuca dealbata, (or vine forest with these species as emergents). Lowland alluvial plains

Estate	RE	Biodiversity status	Short Description
Hinchinbrook Island NP	7.3.23	Endangered	Simple-complex semi-deciduous notophyll to mesophyll vine forest on lowland alluvium, predominantly riverine levees
Hinchinbrook Island NP	7.3.3	Endangered	Mesophyll vine forest with <i>Archontophoenix alexandrae</i> on poorly drained alluvial plains
Hinchinbrook Island NP	7.3.35	Endangered	<i>Acacia mangium</i> and/or <i>A. celsa</i> and/or <i>A. polystachya</i> closed forest on alluvial plains
Hinchinbrook Island NP	7.3.36	Endangered	Complex mesophyll vine forest or simple notophyll vine forest of high rainfall, cloudy uplands on alluvium
Hinchinbrook Island NP	7.3.40	Endangered	<i>Eucalyptus tereticornis</i> open forest on well-drained alluvial plains of lowlands
Hinchinbrook Island NP	7.3.46	Endangered	<i>Lophostemon suaveolens</i> open forest to woodland on alluvial plains
Hinchinbrook Island NP	7.3.5	Endangered	<i>Melaleuca quinquenervia</i> and/or <i>Melaleuca cajuputi</i> subsp. <i>platyphylla</i> closed forest to shrubland on poorly drained alluvial plains
Hinchinbrook Island NP	7.3.8	Endangered	<i>Melaleuca viridiflora</i> +/- <i>Eucalyptus</i> spp. +/- <i>Lophostemon suaveolens</i> open forest to open woodland on poorly drained alluvial plains
Hinchinbrook Island NP	7.3.9	Endangered	<i>Corymbia tessellaris</i> , <i>Acacia</i> spp., <i>Melaleuca</i> spp. open forest, on poorly drained alluvial plains (some soils with marine plain and dune influence)
Holbourne Island NP	8.12.26	Endangered	<i>Corymbia tessellaris</i> and/or <i>Eucalyptus tereticornis</i> open forest on hill slopes of islands and near coastal areas, on Mesozoic to Proterozoic igneous rocks, and Tertiary acid to intermediate volcanics
Holbourne Island NP	8.2.2	Endangered	Semi-evergreen microphyll vine thicket to vine forest, on coastal dunes
Holbourne Island NP	8.2.9	Endangered	Tussock grassland on coastal dunes
Keppel Bay Islands NP	8.11.4	Endangered	<i>Eucalyptus platyphylla</i> and/or <i>Corymbia clarksoniana</i> and/or <i>C. intermedia</i> and/or <i>C. tessellaris</i> woodland on low undulating areas on metamorphosed sediments
Lindeman Islands NP	8.3.2	Endangered	<i>Melaleuca viridiflora</i> woodland on seasonally inundated alluvial plains with impeded drainage
Lizard Island NP	3.2.28	Endangered	Semi-deciduous notophyll vine forest on beach ridges, coral atolls, shingle cays and sand cays
Magnetic Island NP	11.3.11	Endangered	Semi-evergreen vine thicket on alluvial plains
Molle Islands NP	8.12.26	Endangered	<i>Corymbia tessellaris</i> and/or <i>Eucalyptus tereticornis</i> open forest on hill slopes of islands and near coastal areas, on Mesozoic to Proterozoic igneous rocks, and Tertiary acid to intermediate volcanics
Newry Islands NP	8.3.2	Endangered	<i>Melaleuca viridiflora</i> woodland on seasonally inundated alluvial plains with impeded drainage
Northumberland Islands NP	8.2.2	Endangered	Semi-evergreen microphyll vine thicket to vine forest, on coastal dunes

Estate	RE	Biodiversity status	Short Description
Northumberland Islands NP	8.2.9	Endangered	Tussock grassland on coastal dunes
Northumberland Islands NP	8.3.4	Endangered	Freshwater wetlands with permanent water and aquatic vegetation
Orpheus Island NP	7.12.60	Endangered	Melaleuca viridiflora +/- Corymbia clarksoniana +/- Eucalyptus platyphylla woodland to open forest on granite and rhyolite
Orpheus Island NP	7.2.1	Endangered	Mesophyll vine forest on beach ridges and sand plains of beach origin
Orpheus Island NP	7.2.2	Endangered	Notophyll to microphyll vine forest on sands of beach origin
Orpheus Island NP	7.2.7	Endangered	Casuarina equisetifolia +/- Corymbia tessellaris open forest +/- groved vine forest shrublands on strand and foredunes
Orpheus Island NP	7.3.1	Endangered	Hemarthria uncinata and/or Ischaemum australe +/- Sorghum spp. grassland, and/or ephemeral sedgeland, on seasonally inundated alluvial plains
Orpheus Island NP	7.3.10	Endangered	Simple-complex mesophyll to notophyll vine forest on moderately to poorly-drained alluvial plains of moderate fertility
Orpheus Island NP	7.3.6	Endangered	Melaleuca dealbata +/- Melaleuca leucadendra open forest, on poorly drained alluvial plains
Percy Isles NP	8.1.4	Endangered	Schoenoplectus subulatus and/or Eleocharis dulcis sedgeland or Paspalum vaginatum tussock grassland
Percy Isles NP	8.2.2	Endangered	Semi-evergreen microphyll vine thicket to vine forest, on coastal dunes
Percy Isles NP	8.2.7	Endangered	Melaleuca spp. and/or Lophostemon suaveolens and/or Eucalyptus robusta open forest in wetlands associated with parabolic dunes
Possession Island NP	3.2.28	Endangered	Semi-deciduous notophyll vine forest on beach ridges, coral atolls, shingle cays and sand cays
Smith Islands NP	8.12.26	Endangered	Corymbia tessellaris and/or Eucalyptus tereticornis open forest on hill slopes of islands and near coastal areas, on Mesozoic to Proterozoic igneous rocks, and Tertiary acid to intermediate volcanics
South Cumberland Islands NP	8.12.26	Endangered	Corymbia tessellaris and/or Eucalyptus tereticornis open forest on hill slopes of islands and near coastal areas, on Mesozoic to Proterozoic igneous rocks, and Tertiary acid to intermediate volcanics
South Cumberland Islands NP	8.2.2	Endangered	Semi-evergreen microphyll vine thicket to vine forest, on coastal dunes
South Cumberland Islands NP	8.2.9	Endangered	Tussock grassland on coastal dunes
South Cumberland Islands NP	8.3.5	Endangered	Eucalyptus platyphylla and/or Lophostemon suaveolens and/or Corymbia clarksoniana woodland on alluvial plains
Southend CP	12.2.2	Endangered	Microphyll/notophyll vine forest on beach ridges

Estate	RE	Biodiversity status	Short Description
Southend CP	12.3.3	Endangered	Eucalyptus tereticornis woodland on Quaternary alluvium
Three Islands Group NP	3.2.28	Endangered	Semi-deciduous notophyll vine forest on beach ridges, coral atolls, shingle cays and sand cays
Whitsunday Islands NP	8.2.2	Endangered	Semi-evergreen microphyll vine thicket to vine forest, on coastal dunes
Whitsunday Islands NP	8.2.7	Endangered	Melaleuca spp. and/or Lophostemon suaveolens and/or Eucalyptus robusta open forest in wetlands associated with parabolic dunes
Wild Cattle Island NP	12.2.2	Endangered	Microphyll/notophyll vine forest on beach ridges
Wuthathi (Saunders Islands) NP (CYPAL)	3.2.28	Endangered	Semi-deciduous notophyll vine forest on beach ridges, coral atolls, shingle cays and sand cays

12.2 Appendix 4b Key Natural Values (ecosystems) identified through the QPWS Values Based Management Framework because of their importance as habitat for significant species.

Note: These are examples based on the national park islands for which a values assessment has been undertaken as part of the VBMF. The list will grow as more assessments are completed.

Reserve	Value Category	Value Name	Description	Significance	Significance Class
Raine Is NP (Scientific)	Habitat for significant species (marine)	Green turtle rookery	Raine Island is the world's largest known rookery for the internationally vulnerable green turtle <i>Chelonia mydas</i> . (NCA – V, EPBC – V). 90% of the northern Great Barrier Reef population of green turtles nest at Raine Island and Moulter Cay.	National	Vulnerable
Capricornia Cays NP	Habitat for significant species (terrestrial)	Seabird rookery and shorebird habitat	The Great Barrier Reef is especially important for seabirds with 1.4 to 1.7 million seabirds from 23 species migrating to the Great Barrier Reef World Heritage Area (GBRWHA) each year to breed. The Capricornia Cays support 73-75% of all seabird biomass in GBR.	International	BONN
Capricornia Cays NP	Habitat for significant species (terrestrial)	Loggerhead and green turtle rookery	Loggerhead turtles <i>Caretta caretta</i> (NCA – E, EPBC – E); links to OUV10. The eastern Australian loggerhead turtle breeding population has suffered significant declines. Between 1977 and 2000 an 86% decline in breeding females was recorded.	National	Endangered
Curtis Is NP	Habitat for significant species (terrestrial)	Parabolic and foredune communities	The parabolic and foredune communities in the northeast (Regional ecosystem (RE) 12.2.14, 12.2.2 12.2.11) and foredune in the southeast (RE 12.2.14 and 12.2.11) of Curtis Island are coastal dune systems that support diverse vegetation communities.	International	World Heritage
Curtis Is NP	Habitat for significant species (terrestrial)	Parabolic and foredune communities (Southend Beach)	The parabolic and foredune communities in the northeast (Regional ecosystem (RE) 12.2.14, 12.2.2 12.2.11) and foredune in the southeast (RE 12.2.14 and 12.2.11) of Curtis Island are coastal dune systems that support diverse vegetation communities.	International	World Heritage
Curtis Is NP	Habitat for significant species (terrestrial)	Marine plain	The 4000ha marine plain in the northeast of the island is the southern limit for a tropical marine plain community. This vast wetland is the most prominent feature of the 9536 ha 'Northeast Curtis Island' wetland on the Directory of Important Wetlands in Australia.	International	World Heritage
Raine Is NP (Scientific)	Habitat for significant species (terrestrial)	Seabird nesting habitat	Raine Island is the most diverse seabird rookery in the Great Barrier Reef region, supporting significant populations of a greater variety of seabirds than anywhere else in the GBRWHA.	National	Critically endangered

12.3 Appendix 4c Key Historic and Indigenous Values identified through the QPWS Values Based Management Framework and QPWS Historic Cultural Heritage Strategy

Note: The examples in Indigenous values are based on the national park islands for which a values assessment has been undertaken as part of the VBMF. The list of Indigenous values will grow as more assessments are completed.

Reserve	Value Category	Value Name	Description	Significance	Significance Class
Magnetic Is NP	Historic (shared heritage)	Forts complex	Listed on the Queensland Heritage Register, the Forts complex was built on a heavily timbered, mountainous point behind Florence Bay in 1942-43, during World War II.	State	Qld Heritage Register
Raine Is NP (Scientific)	Historic (shared heritage)	Stone beacon	Listed with the National Trust of Queensland. Constructed in 1844, a 14m double-walled stone beacon was built by convict labourers and remains the oldest colonial stone building in Queensland.	State	Qld Heritage Register
Round Island Conservation Park	Historic (shared heritage)	Booby Island Lightstation (operational) QHR 601724			Qld Heritage Register
Cape Capricorn Conservation Park / Curtis Island National Park	Historic (shared heritage)	Cape Capricorn Lightstation			Qld Heritage Register
Lizard Island National Park	Historic (shared heritage)	Stone Ruin at Lizard Island			Qld Heritage Register
Capricornia Cays NP	Indigenous	Traditional Owner Connection to Country	The Traditional Owners were sea country specialists, using the rich marine resources of the intertidal zones, reefs and surrounding seas to support their community.	State	
Fitzroy Is NP	Indigenous	Traditional Owner Connection to Country	Consultation with the Traditional Owners is required before an assessment of this key value can be undertaken. Fitzroy Island and the surrounding reef comprise part of the traditional homeland of the Gunggandji people.		
Green Is NP	Indigenous	Traditional Owner Connection to Country	Wunyami (Green Island and the surrounding reef) is within the sea country of the Gunggandji people and holds traditional and contemporary cultural significance for them. They have lived in this area for thousands of years.	Regional	
Hinchinbrook Is NP	Indigenous	Traditional Owner connection to country	The Traditional Owners of Hinchinbrook Island have lived in harmony with the land, sea and seasons—they have maintained spiritual, social, traditional resource and family connections.	Regional	
Magnetic Is NP	Indigenous	Traditional Owner Connection to Country - cultural sites	The majority of these sites are intact: Shell middens: located in all catchments on the island. Relatively undisturbed sites may contain features of cooking hearths, stone arrangements, artefact knapping horizons and terrestrial dietary remains.	State	
Raine Is NP (Scientific)	Indigenous	Traditional Owner Connection to Country	Consultation with the Traditional Owners is required before an assessment of this key value can be undertaken. Links to World Heritage OUV9. Raine Island National Park is a significant cultural and story place for Aboriginal and Torres Strait Islander people.	International	World Heritage

12.4 Appendix 4d Key Visitor Values identified through the QPWS Values Based Management Framework

Note: These are examples based on the national park islands for which a values assessment has been undertaken as part of the VBMF. The list will grow as more assessments are completed.

Reserve	Value Category	Value Name	Description	Significance	Significance Class
Capricornia Cays NP	Recreational opportunities	Visitor experience	Large populations of breeding seabirds and marine turtles, vegetation diversity and tall pisonia forests make the Capricornia Cays a globally significant and critically important area for conservation.	Local	
Fitzroy Is NP	Recreational opportunities	Walking tracks	Fitzroy Island National Park is a recreation and tourism destination in the Cairns region and is a popular day-visit for local residents and visitors.	Regional	
Green Is NP	Recreational opportunities	Walking track and boardwalk	Approximately 700m of raised boardwalk and a number of short walking tracks in the national park provide visitors access to the beach around the island and the vine forest within.	Regional	
Green Is NP	Recreational opportunities	Visitor experience (overall)	Green Island is a significant recreation and tourism destination in the Cairns region, located 27km offshore from Cairns. Popular for its tropical island setting and broad range of nature-based activities, it is easily accessed from Cairns.	International	
Green Is NP	Recreational opportunities	Visitor experience (water/reef)	Green Island is a significant recreation and tourism destination in the Cairns region, located 27km offshore from Cairns. Popular for its tropical island setting and broad range of nature-based activities, it is easily accessed from Cairns.	International	
Green Is NP	Recreational opportunities	Visitor experience (coral cay)	Green Island is a significant recreation and tourism destination in the Cairns region, located 27km offshore from Cairns. Popular for its tropical island setting and broad range of nature-based activities, it is easily accessed from Cairns.	International	
Hinchinbrook Is NP	Recreational opportunities	Thorsborne Trail precinct	The park is internationally renowned, particularly amongst bushwalkers, for its 'wilderness' or 'remote and wild nature' experience. The isolated island provides world-class, spectacular and beautiful scenery where visitors enjoy a rare sense of solitude.	International	World Heritage
Magnetic Is NP	Recreational opportunities	Visitor experience - walking tracks	Magnetic Island is an important site for people to experience and appreciate the values of the GBRWHA due to its close proximity to the mainland coastline and regional centre of Townsville. The island and park attracts local, interstate and international visitors.	State	
Magnetic Is NP	Recreational opportunities	Visitor experience - Lookouts	Magnetic Island is an important site for people to experience and appreciate the values of the GBRWHA due to its close proximity to the mainland coastline and regional centre of Townsville. The island and park attracts local, interstate and international visitors.	State	

13.0 Appendix 5 QPWS Values Based Management Framework – Health Check Monitoring

‘Health Checks’ is a qualitative tool for monitoring the condition of key values on Queensland national parks and other reserves. They use criteria based on disturbances and damage (e.g. presence of pest plants, overgrazing, trampling, fire and cyclone impacts, vandalism), or particular features (e.g. faunal habitat, recruitment of canopy species), that are a good indication of condition and can be applied state-wide. The assessor scores the condition of the value for each criterion or indicator, at representative sites, using simple visual cues. No specialist equipment is needed. The Health Check report uses the IUCN categories (good, good with some concern, significant concern, critical) and their definitions to describe the overall condition of a value across the reserve based on all the Health Check indicators relevant to the value. A Health Check tool has so far been developed for each of natural, historic and visitor value. (From Melzer in prep.).

13.1 Appendix 5a Natural Values

From: Melzer R. (2017) Guide to undertaking Health Checks for key natural values. Vers. 1.3. Queensland Parks and Wildlife Service.

Note: Health Checks are not designed to monitor species. Natural Values, in the context of Health Checks, are regional ecosystems, vegetation communities or particular habitat types.

Reef 2050 and other management requirements [target/goal/outcome]	Indicator	Scale of application (spatial)	Scale of application needed (temporal)	Justification for indicator i.e. rationale and previous evidence	Limitations/caveats to interpretation or applicability
VBMF program IUCN Condition classes: <ul style="list-style-type: none"> • Good • Good with some concern • Significant concern • Critical 	<i>Detailed as individual rows below.</i> Note: There are a set of criteria, for each indicator, for determining the condition class.	NP islands (All) Number and location of sites considered in development of Monitoring and Research Strategy. No less than three sites unless value is unique (e.g. one spring) or very small (< 50ha). More if value extensive and/or widely distributed.	Annual preferred Time/season shifts dependent upon indicator. Timing specified in a Monitoring and Research Strategy if the park has one. Attempt same time period/season each year; aim for season when weeds most recognisable.	The indicators, particularly taken together, provide a good indication of condition and can be applied state-wide.	Health Checks provide very basic monitoring. They can highlight the need for detailed monitoring. Only if change occurs at the category scale will trend be detectable. The frequency of sampling may limit power to detect change at some scales.
	Ecosystem-changing pest plants			Non-native species, or native species outside natural range, that have potential to substantially & permanently alter structure &/or composition of an ecosystem by direct (e.g. competition) &/or indirect (e.g. changed fire regimes) means	
	Pest plants other than ecosystem-changers			Reflect the level of disturbance (e.g. over-grazing by stock, feral grazers or native grazers; too frequent burning; flooding). Some may also have a significant impact on the habitat of a species	
	Risk of future invasion by significant pest plants			Raises awareness of risk. Early warning is best.	
	Rainforest invasion	Do not use where the ecosystem was previously rainforest and the goal is rainforest recovery		Threatens the status and ecological function (including provision of habitat for fauna) of existing ecosystems.	
	Woody thickening (other than by rainforest species)			Threatens the status and ecological function (including provision of habitat for fauna) of existing ecosystems.	
	Over-grazing/over-browsing by feral animals, stray stock or natives			Threatens the status and ecological function of ecosystems.	
	Trampling, digging or rooting by feral animals, stray stock, or horse-riding, or trampling by visitors			Threatens the status and ecological function of ecosystems.	
	Impacts on wetlands	wetlands		Wetlands are significant values providing an uncommon niche (on islands) for flora and fauna.	
	Vehicle impacts			Vehicles can have direct (e.g. disturbance, 'roadkill', nest destruction) & indirect impacts (e.g. vehicle ruts can be an impediment to turtle hatchlings; expose areas to soil erosion and runoff) on ecosystem health and function.	
	Dumping. Does not include 'normal' littering but pre-meditated action of going to 'the bush,' rather than the dump.			Dumping can have direct physical impacts on an ecosystem and/or indirect impacts (e.g. leaching of chemicals).	
	Ground cover	Most – exceptions include foredunes, salt pans, sites used by nesting turtles.		Ground cover plays a very important role in maintaining healthy ecosystems. Good ground cover significantly	

Reef 2050 and other management requirements [target/goal/outcome]	Indicator	Scale of application (spatial)	Scale of application needed (temporal)	Justification for indicator i.e. rationale and previous evidence	Limitations/caveats to interpretation or applicability
				reduces runoff (& hence erosion & nutrient loss) & evaporation	
	Fire damage to fire-sensitive ecosystems	All ecosystems not adapted to fire. Not used for ecosystems that 'simply' require long fire intervals		Threatens the persistence, status and ecological function of existing ecosystems.	
	Fire damage to peat-based systems	Peat-based ecosystems (e.g. sedgelands, wet heaths, fens)		Threatens the survival, status and ecological function of existing ecosystems.	
	Age class distribution in fire-adapted ecosystems in zones where the primary purpose is conservation	All fire-adapted ecosystems in zones where the primary purpose is conservation		Creating a mosaic of burn ages across a landscape to maintain a varied vegetation age class distribution is important for providing the wide range of niches required for the plant & animal species reliant on an ecosystem.	
	Severe wildfire in fire-adapted ecosystems	All fire-adapted 'wooded' ecosystems except communities for which regular, fairly frequent severe fires are part of their ecology (e.g. coastal heathlands).		The condition of an ecosystem changes with time since disturbance. First assessment may occur in the immediate aftermath or several years after it occurred. Descriptions attempt to cover this.	Note: Infrequent severe disturbance is a natural component of the ecology of some ecosystems. Ratings based on 'face-value' – that is, what the ecosystem looks like after disturbance. Does not take into account whether canopy loss (for example) may be critical to recruitment and the long-term survival of such ecosystems.
	Severe storm, cyclone or tornado	All 'wooded' ecosystems		As above	As above
	Overtopping, erosion & associated impacts resulting from tidal inundation, major flooding, storm, cyclone, tsunami or other erosional processes.	All key value islands		Most of these are natural disturbances (though climate change is expected to increase their frequency and severity). They may however, impact on key ecosystems or habitat whose condition we have reason to evaluate over time. 'Other erosional processes' cover circumstances where an event such as a landslip may not be able to be attributed to any of the other listed causal agents.	
	Tree/shrub health and dieback	All 'wooded' ecosystems		Die-back can be caused by a wide range of factors which are often interacting. To inform tactical and operational management we first need to know occurrence	
	Key features for faunal biodiversity in terrestrial ecosystems	Terrestrial ecosystems. Aquatic ecosystems and ecosystems subject to tidal inundation are not included.		Habitat features important for faunal diversity.	
	Recruitment of canopy species	Woodlands to closed forests other than those where recruitment is known to be naturally rare or episodic and results in even-aged stands. Not for shrublands.		Recruitment is essential to the sustainability of any ecosystem.	

13.2 Appendix 5b Historic (shared) Values

From: Melzer R., Pyke M. and Smith J. (2017) Guide to undertaking Health Checks for key historic values. Vers. 1.3. Queensland Parks and Wildlife Service.

Reef 2050 and other management requirements [target/goal/outcome]	Indicator	Scale of application (spatial)	Scale of application needed (temporal)	Justification for indicator i.e. rationale and previous evidence	Limitations/caveats to interpretation or applicability
VBMF program IUCN Condition classes: <ul style="list-style-type: none"> • Good • Good with some concern • Significant concern • Critical 	<i>Detailed as individual rows below.</i> Note: There are a set of criteria, for each indicator, for determining the condition class.	NP islands (All) Number and location of sites considered in development of Monitoring and Research Strategy.	Annual preferred	The indicators, particularly taken together, provide a good indication of condition and can be applied state-wide.	Health Checks provide very basic monitoring. They can highlight the need for detailed monitoring. Only if change occurs at the category scale will trend be detectable. The frequency of sampling may limit power to detect change at some scales.
	Vertebrate animal damage	All sites except managed ruins			
	Invertebrate animal damage	Those made of, or containing, timber or fibre; not including historic plantings. Managed ruins are not included.			
	Vegetation – direct mechanical damage	All built fabric. Managed ruins are not included			
	Vegetation – increased fire risk	All that are flammable or that can be damaged by heat including historic plantings. Managed ruins are not included.			
	Vegetation – invasion/encroachment	All except managed ruins			
	Ground surface modification (e.g. erosion, subsidence, compaction, altered drainage)	All except managed ruins			
	Damp (rising/falling)	All built fabric. Managed ruins are not included.			
	Weather events & weathering	All built fabric. Managed ruins are not included.			
	Tree/shrub health & dieback	Historic plantings; heritage listed plants.			
	Fire damage	All that are flammable or that can be damaged by heat including historic plantings. Managed ruins are not included.			
	Visitor impacts including vandalism, theft & other inappropriate behaviour	All			
	Safety/restricted access issues	Sites closed to public access			
	Inappropriate management	All			

13.3 Appendix 5c Visitor Values

From: Olds J., Melzer R., and Mansfield D. (2017) Guide to undertaking Health Checks for key visitor values. Vers. 1.3. Queensland Parks and Wildlife Service.

Reef 2050 and other management requirements [target/goal/outcome]	Indicator	Scale of application (spatial)	Scale of application needed (temporal)	Justification for indicator i.e. rationale and previous evidence	Limitations/caveats to interpretation or applicability
VBMF program IUCN Condition classes: <ul style="list-style-type: none"> • Good • Good with some concern • Significant concern • Critical 	<i>Detailed as individual rows below.</i> Note: The criteria for determining the condition class are not provided. Refer Melzer 2017.	NP islands (All) Number and location of sites considered in development of Monitoring and Research Strategy.	Annual preferred Timing specified in a Monitoring and Research Strategy if the park has one. Attempt same time period.	The indicators, particularly taken together, provide a good indication of condition and can be applied state-wide.	Health Checks provide very basic monitoring. They can highlight the need for detailed monitoring. Direct evaluation of parameters such as crowding, congestion, noise levels, and visitor satisfaction are beyond the scope of a Health Check. Only if change occurs at the category scale will trend be detectable. The frequency of sampling may limit power to detect change at some scales.
	Condition of built infrastructure				
	Ground surface damage or modification				
	Condition of roads				
	Widening/spread of footprint				
	Trampling by visitors or animals				
	Adequacy of toilet facilities				
	Vandalism and theft				
	Vehicle impacts				
	Litter or dumped rubbish				
	Campfire places outside of designated fire pits				
	Modified wildlife behaviour				
	Impacts on wetlands				
	Infestations of pest plants (includes aquatic pest plants)				

14.0 Appendix 6 BioCondition – summary of the functional role of vegetation for biodiversity and indicators of those functions

From Eyre R.J., Kelly A.L., Neldner V.J., Wilson B.A., Ferguson D.J., Laidlaw M.J. and Franks A.J. (2011) BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual. Department of Environment and Resource Management, Brisbane.

Vegetation functions	Attributes that act as indicators of the functions
Structural aspects	
Provision of reliable foraging resources for wildlife (e.g. nectar, leaves, seeds)	Large trees Shrub cover Tree canopy cover Native perennial grass Coarse woody debris Organic leaf litter Ground cover
Provision of reliable sheltering resources and or breeding sites for wildlife	Large trees and/or hollow-bearing trees Coarse woody debris Tree canopy cover Shrub cover Organic litter Perennial grass cover
Functional aspects	
Nutrient and water cycling	Tree canopy cover Organic litter cover Coarse woody debris
Maintenance of soil condition	Organic litter cover Native perennial 'decreaser' grass species basal area Native perennial non-grass cover Coarse woody debris
Retention of plant propagules	Organic litter Coarse woody debris
Compositional aspects	
Maintenance of plant species diversity	Native plant species richness Recruitment of canopy species Native perennial 'decreaser' grass species basal area Non-native plant species cover (lack of)

15.0 Appendix 7 Island Watch

Island Watch was developed by Bridget Armstrong (QPWS) to provide a tool for the simple and rapid assessment of indicators of island health and condition – to be undertaken at sites where rangers are already undertaking other works. The tool prompts staff to “check for change” – to be vigilant and report observations relevant to park management such that early intervention can be undertaken if appropriate. A copy of the Island Watch proforma is provided below. It has recently been incorporated into the Great Barrier Reef and Marine Park (the Marine Park) Field Reporting System. Island Watch complements the Health Check program.

GBRMP Island Watch – QPWS



Ver: 17_10

Scope: To provide information about the condition and trend of all islands and cays so that changes and risks can be tracked, assessed and actioned.
Does not replace or duplicate existing systems. This serves as a cover sheet to collate all info.
All records must still be entered into the appropriate systems (eg Wildnet, FLAME). This form does not replace that.

Person completing form (full name)		Additional observers on the island and affiliation (eg Wildmob/volunteers/indigenous ranger group):	
Date	Purpose of visit:	Amount of time spent on island (hours/days)	
Island name	GBR Island number or NP name or general locality (in case of duplicate names)		
		Yes/ No	COMMENTS/ FUTURE ACTIONS NEEDED
BIRDS All data to be entered into QPWS bird database.	Incidental bird survey done		
	Coastal Bird Monitoring and Information Strategy survey done (essential/significant site)		
	Is this a new or unusual bird sighting, or are there any changes to condition of nesting/roosting habitat?		
TURTLES Photos of tracks with an object to indicate size is very useful for ID. Entries should be made in Wildnet or Strandnet where relevant.	Turtles seen on island (Species and number) Specify live or dead - measure CL and cause of death if possible		
	Number of nests /bodypits (each nest will have two tracks – one up and one down)		
	Any signs of nest predation (include number of nests affected & predator if known eg dog, pig, goanna)		
	Tracks seen (species and number) (or specify if hatchling tracks)		
	Is this a new or unusual sighting, or are there any changes to condition of nesting habitat ?		
CROCODILES Complete Wildnet entry/ croc sighting form	Number of crocs or slides seen, size estimates, general location		
	Is this a new or unusual sighting, change in abundance, or any cause for safety concerns?		
WEEDS Sketch rough location on next page if needed Infestation classes: Rare <5% Light 5-15 % Moderate 15-50% Heavy >50% Extent of island infested: Give estimate of diameter (m) or proportion of island infested. (Info requested here feeds directly into statewide Health Checks)	Does the island/cay appear weed-free ? (If not, please complete rows below)		
	Species and brief description (Eg “Lantana, rare, eastern half of island, 50cm tall” to describe scattered isolated plants; or “Mossman River Grass, moderate, 30m diameter, flowering” to describe a localized infestation with 30m diameter) Take photos or samples if you are not sure of identification – can send to Tech Support or Herbarium for confirmation. Use the space at the end of the form to make sketches if needed Remember to still enter weed info in more detail into FLAME		
	Any new weeds for this site, or has previous extent changed (bigger or smaller)?		

	Weed control work undertaken ? If so, give brief description.		
	Risk of future weed invasion ? Any weeds in adjacent areas/islands that may become a threat ? Record species, current location, potential vectors.		
WILDFIRE Remember to enter detailed info into FLAME. (Info requested here feeds directly into statewide Health Checks)	Signs of wildfire?		Include severity, scorch height, extent of fire, veg type (eg beach scrub, foredunes, open woodland, grassland).
	Rehabilitation required (revegetation) ? Particularly for habitat or food trees, or nesting birds, or fire sensitive veg.		
PEST ANIMALS Remember to enter detailed info into FLAME Be alert for ants at infestation levels – bring back a sample for ID – can store in turps, metho, spirit alcohol – send to CSIRO or Island Watch coordinator for ID	Any signs of pest animals? Includes pigs, rodents, ants, cockroaches, cane toads. Take photos and specimens if appropriate.		Include signs and intensity of trampling and rooting by ferals. Abundance of dung/scats , signs of grazing, rodent or cat tracks, etc.
	Pest control work undertaken? Give brief description eg goat culling, ant baiting.		
	Any new pests for this site, or has previous extent or abundance changed?		
NATIVE FAUNA AND FLORA Complete Wildnet entry and/or submit photo or sample to Tech Support, herbarium or other.	Anything of interest, species records, any changes or concerns?		
OTHER RISKS eg disease on plants, cyclone damage, marine debris, overtopping, vehicle impacts, any other changes observed. Take photos if possible.	Include compliance concerns eg littering, veg clearing, signs of fishing in green zone (opened oyster shells, fish cleaning).		
CULTURAL VALUES Report to supervisor and complete Cultural Heritage record if relevant.	Anything new or any changes? eg Artefacts or artwork, scar trees, middens, graves, wells. Any damage or changes to known sites?		
INFRASTRUCTURE Deterioration in condition of signs, tracks, toilets etc and any work required. Any graffiti or littering? Report to your RIC.			
MONITORING & COLLECTIONS	Any photo monitoring, botanical or faunal surveys, etc ?		
	If so, by whom and where is info stored? (eg QLD Herbarium)		
SPATIAL DATA & PHOTOGRAPHS	Details of where photos or GPS data will be stored, to show weeds, turtle tracks, etc.		
AREAS VISITED: Describe which parts of the island were visited, how much of the perimeter was walked, which bays were accessed, etc. Or sketch below.			

Sketch of island/cay and rough location of anything of interest: (use additional pages if needed)

16.0 Appendix 8 Great Barrier Reef World Heritage Area Island Pest Monitoring – Biosecurity Surveillance

QPWS has promoted a Great Barrier Reef World Heritage Area (the World Heritage Area) approach to Island Biosecurity with the development and implementation of comprehensive island pest management strategies whose foundation is biosecurity – moving towards a border protection focus to prevent pest establishment. Island Biosecurity, encompasses:

- quarantine – the containment, removal or destruction of a pest before it reaches an island;
- surveillance – early detection; and
- emergency response – early intervention.

Levels of Service (LOS) have been developed by QPWS to define management standards for its estate. The standards are designed to align management effort with agreed priorities and deliver consistent, transparent and effective management. QPWS developed LOS for island biosecurity to guide the level of biosecurity needed for all World Heritage Area islands based on their values, threats and risks from pests (See Diagram 1).

World Heritage Area Island Biosecurity LOS broadly are as follows:

Adequate	27 World Heritage Area islands will receive adequate biosecurity measures to prevent the introduction or spread of critical risk biosecurity matters. Highly reliant on generic guidelines, raised awareness and self-monitoring.
Medium	269 World Heritage Area islands will receive practical biosecurity measures to prevent the introduction or spread of critical and very high risk biosecurity matters. May involve approved permit conditions and contractor certification of compliance with biosecurity measures.
High	52 World Heritage Area islands will receive strong biosecurity measures to prevent the introduction or spread of critical, very high and high risk biosecurity matters. May include audits of compliance with biosecurity measures.
Very high	12 World Heritage Area islands will receive thorough biosecurity measures to prevent the introduction or spread of critical, very high and high risk biosecurity matters. May include restrictions on certain activities and items and certification of compliance with quarantine.
Exceptional	Three World Heritage Area islands will receive comprehensive measures to prevent the introduction and spread of most biosecurity matters. Highly reliant on strict quarantine measures (including significantly restricted access) and direct QPWS supervision of third.

Along with other thematic strategies such as Fire and Visitor management, new Pest Strategies are now being developed more broadly for all World Heritage Area islands under the VBMF.

The new Pest Strategies are guided by four the Strategic Management Directions: Prevention; Eradication; Containment; and Reduction of Impacts. To ensure pest introductions are minimised, quarantine and surveillance prescriptions for islands are included among actions under the pest prevention SMD. The LOS for island biosecurity now inform the development of the new Pest Strategies in the Reef.

Diagram 1: Levels of Service for Island Biosecurity concept diagram

