**Supplementary Information Text S1**

*To accompanying the paper by Jon C. Day titled…*

**Key principles for effective marine governance, including lessons learned after decades of adaptive management in the Great Barrier Reef**

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1. **Brief overview** of the Great Barrier Reef (GBR) in recent years
2. **Details of governance arrangements** in the GBR, including the Intergovernmental agreement, the Ministerial Forum, the Independent Expert Panel, Local Marine Advisory Committees, etc.
3. **Independent Review of Governance** of the GBR Marine Park Authority
4. **Other examples** of good governance practices in Australia

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1. **Brief overview of the Great Barrier Reef in recent years**

Australia’s GBR Marine Park (GBRMP) is no longer the largest MPA in the world; since 2006, many larger MPAs have been declared but few have the breadth of management experience that has evolved over decades in the GBR. Management of the GBR involves federal, state and local governments, Traditional Owners, industries, researchers, community organizations and individuals across an area equivalent in size to Italy or Japan (Day & Dobbs, 2013).

While GBR governance is subject to diverse influences that can transcend jurisdictional boundaries, it is highly integrated. A wide range of Federal and State [legislation](https://www.gbrmpa.gov.au/about-us/legislation-regulations-and-policies/legislation) is relevant to the GBR, but the primary legislation is the [*Great Barrier Reef Marine Park Act 1975*](https://www.legislation.gov.au/Series/C2004A01395) and its accompanying [Regulations](https://www.legislation.gov.au/Details/F2019L00166).

Another key statutory planning instrument is the GBR [2003 Zoning Plan](https://elibrary.gbrmpa.gov.au/jspui/retrieve/dad1ff4a-e985-494c-85e5-a3935f2b4123/GBRMP-zoning-plan-2003.pdf) (a foundational spatial plan separating conflicting uses in the multiple use MPA). However, many other management mechanisms, spatial and temporal, are also used to provide the overall integrated management approach (Day et al., 2019). Other key guiding documents include the [Reef 2050 Long-term Sustainability Plan](https://www.awe.gov.au/sites/default/files/documents/reef-2050-long-term-sustainability-plan-2021-2025.pdf) (an overarching long-term strategy for protecting and managing the GBR by supporting its health and resilience), 5-yearly [GBR Outlook Reports](https://www.gbrmpa.gov.au/our-work/outlook-report-2019) and the [Reef Blueprint](https://www.gbrmpa.gov.au/our-work/reef-strategies/managing-for-a-resilient-reef).

The [2017 Scientific Consensus Statement](https://www.reefplan.qld.gov.au/about/assets/2017-scientific-consensus-statement-summary.pdf) (Waterhouse et al., 2017) identified the governance of the GBR as a ‘wicked’ problem stating, *“Overall, the governance of the Great Barrier Reef is inherently complex. Coordination between governments and government programs is critical to provide clear policy signals and ensure effective management actions* “. This highlights that GBR governance requires adaptive, participatory, and transdisciplinary approaches. Morrison (2017) outlines some of the governance concerns since 2006, citing various issues that have had implications for the effectiveness of management.

The GBR is suffering as a consequence of a range of pressures including climate change, declining water quality, unsustainable fishing practices, ship groundings, and unintended impacts of coastal development. In 2013 the World Heritage Committee considered listing the GBR as ‘World Heritage in Danger’ unless there was ‘substantial progress’ to address various concerns. Following the release of the [2019 GBR Outlook Report](https://www.gbrmpa.gov.au/our-work/outlook-report-2019) (a forward-looking assessment report that concluded the long-term outlook for the GBR had deteriorated from poor to very poor), there was increased national and international focus upon the GBR.

The Reef 2050 Plan (Commonwealth Government, 2015) aims to address various concerns raised by the World Heritage Committee and is a key component of the way the GBR is currently being managed. Fundamental to the successful implementation of the Reef 2050 Plan, is input from a range of contributors facilitated through various governance arrangements, which are discussed in greater detail in section 2 below.

In the past, management of the GBR had been widely regarded as relatively effective for a range of reasons, including the sound governance/legislative framework together with complementary federal/state legislation; integrated management with relevant federal and state agencies; and the application of ecosystem-based management principles both inside and outside the area of the marine park’s jurisdiction (Day & Dobbs, 2013).

Like many MPAs, the GBR is likely to survive under the pressure of accumulating risks, but the current long-term outlook for the GBR is not good. In recent years there has been increasing publicity about the range of pressures facing the GBR, not the least being the mass coral bleaching events that occurred in 2016, 2017 and 2020. Furthermore, increasing evidence is pointing to the deterioration of the ecological processes being more rapid and widespread than was previously evident.

The future of the GBR will be dependent upon a wide range of actions at international, national and State levels. Amongst these, the future actions of the Australian and Queensland Governments will be critical, and there is a real need for these actions to be more aligned to the legal obligation in the GBRMP Act to ensure the *“…long term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef…”* (i.e., the primary object of the Act).

1. **Details of governance arrangements in the Great Barrier Reef**

Many aspects of the governance framework applied in the GBR Marine Park and the GBR Reef World Heritage Area may be relevant to effective governance for MPAs elsewhere including:

* The GBR Intergovernmental Agreement between the federal and State governments
* The GBR Ministerial Forum overseeing implementation of the Reef 2050 Plan.
* A multi-sectoral Advisory Committee facilitating engagement with the broader community.
* An Independent Expert Panel providing expert advice on implementation of the Reef Plan.
* The Standing Committee of senior officials of both governments ensuring implementation of the Plan and reporting annually to the GBR Ministerial Forum.
	1. **The GBR Intergovernmental Agreement**

The long-standing working relationship between successive Australian (federal) and Queensland (state) governments for the protection and management of the GBR was first formalised through an agreement in 1979. The initial agreement was a 3-page briefing paper that the Australian Prime Minister took to a meeting with the Queensland Premier. It outlined key points such as who would undertake day-to-day management of the marine park; who would lead the planning; and that a Ministerial Council of four members (two from each government) would be established to coordinate policy. Both the PM and the Premier signed each page which henceforth became known as the Emerald Agreement (Emerald being the town where it was signed) and it was considered binding upon both governments.

Over the succeeding decades, various subordinate documents were developed and agreed to ensure a close working relationship between the statutory federal agency (GBRMPA) and Queensland, addressing such aspects as complementary zoning, shared funding for day to day (or field) management and joint permits. This strong working partnership has ensured effective management of the complex and inter-related mix of marine, coastal and island issues[[1]](#footnote-1), and has also minimised confusion for users and bureaucrats alike.

In June 2009, an updated Great Barrier Reef [Intergovernmental Agreement](http://www.environment.gov.au/system/files/pages/7a85531d-9086-4c22-bdca-282491321e46/files/gbr-iga-2015.pdf) (IGA) replaced the 1979 agreement, providing a contemporary framework for cooperation between both governments, and recognizing challenges such as climate change and catchment water quality that were unforeseen in 1979.

The joint development of the Reef 2050 Plan in 2015 led to the IGA to again being updated to reflect the shared vision outlined in that plan and renewed both governments’ commitment to protecting the GBR World Heritage Area including its Outstanding Universal Value.

Today, the IGA has evolved into a comprehensive 41-page document providing a clear and effective framework for facilitating cooperative management of the GBR, with the commitments of both governments detailed in schedules which help to implement the IGA. The actual IGA comprises the agreement (10 pages) and seven schedules covering the following:

1. The Great Barrier Reef Region and World Heritage Area
2. Protocols for the Operation of the Great Barrier Reef Ministerial Forum
3. Joint Field Management Program for the Great Barrier Reef Marine Park and Queensland national and marine parks within the Great Barrier Reef World Heritage Area
4. Climate Change and the Great Barrier Reef
5. Fishing and Collection of Fisheries Resources in the Great Barrier Reef World Heritage Area
6. Reef 2050 Water Quality Improvement Plan 2017-2022
7. Reef 2050 Long-Term Sustainability Plan

Both the Commonwealth and Queensland recognise various guiding principles (pages 7-8 in the Agreement) and apply them when implementing the agreement. These principles include:

* *A collaborative and cooperative approach is fundamental to the effective long-term protection, conservation and management of the Great Barrier Reef as this is beyond the power and remit of either jurisdiction*
* *Initiatives should be delivered through a concerted response across all levels of government with shared funding arrangements for joint Commonwealth-State initiatives agreed on a case-by-case basis.*
	1. **The Ministerial Forum**

The level of inter-governmental coordination facilitated by the Ministerial Forum is considered essential to achieve the objectives of the IGA and oversee the implementation of this complex World Heritage Area. It also provides a formal opportunity for joint policy development and coordination in relation to issues affecting the protection, conservation, management and use of the GBR ecosystem as encompassed by the GBR World Heritage Area.

The Ministerial Forum must meet at least once a year to discuss the GBR, and sometimes also uses the opportunity to discuss other World Heritage properties that also have federal-state jurisdictional issues (e.g., Wet Tropics of Queensland).

While not a formal guiding principle, it is generally understood that items of a procedural and technical nature are not dealt with by the Ministerial Forum but are delegated as far as possible to a Standing Committee of Officials (see #2.5 below) to determine or be dealt with out-of-session.

* 1. **Multi-sectoral Advisory Committee**

This is a broad-based, high-level advisory committee providing advice from the perspectives of rights-holders and stakeholders on matters affecting the management of the GBR – the need for such a broad-based committee was recognized soon after the GBR legislation was proclaimed.

In 1977, a formal Great Barrier Reef Consultative Committee (GBRCC) was established under the Act as an independent advisory body, advising both the statutory agency (GBRMPA) and the Minister. Specific functions for the GBRCC were defined in the Act and it consisted of members appointed by the Minister for a three-year term and a member of the Authority (Board) appointed for an indefinite term. In 1977 the GBRCC had 19 members representing a wide cross-section of interests in the GBR from the public and private sectors, including tourism, fishing, science, conservation, local government and Aboriginal communities; in 1996, the GBRCC had 17 members (see pp. 65-66 in <https://core.ac.uk/download/pdf/50850708.pdf>).

In 2004, the Minister decided that the membership of the GBRCC would be expanded to include representatives from at least five Local Marine Advisory Committees (see #2.7 below).

In 2007, a legislative change abolished the GBRCC, replacing it with a non-statutory advisory board reporting directly to the Minister. In 2015, another formal committee was established called the Reef 2050 Plan Advisory Committee. The committee includes members from the Reef 2050 Long-Term Sustainability Plan Partnership Group, Traditional Owners, and community representatives.

The role of this committee was to provide strategic advice to the Great Barrier Reef Ministerial Forum on the implementation of Reef 2050 Plan. The [Terms of Reference](http://www.environment.gov.au/system/files/pages/abff0d5e-b94d-4495-b79b-90dc52274f69/files/reef-2050-advisory-committee-tor.pdf) for the committee indicate it may include some 18 members from across industry and the broader community, and Australian and Queensland government officials also attending as observers. One of the Committee’s principal tasks in the early stages of its work was to prioritise the 139 actions in the Reef 2050 Plan.

Given the roles and responsibilities of this committee and Recommendation #24 in the 2017 governance review about “… *establishing a broad-based, high-level stakeholder consultative committee for the provision of advice on stakeholder perspectives on matters affecting the management of the Marine Park”,* it is strongly recommended such an advisory committee be established in any complex MPA.

*[Whether it should be called an* Advisory *or* Consultative Committee *is debatable; the term Advisory Committee seems more suitable because that is exactly what occurs – the members provide advice from their perspectives, but there is no guarantee that the sometimes-disparate views of all members can be met].*

* 1. **Independent Expert Panel**

The importance of utilizing the best available scientific advice for sound decision-making is obvious. Any MPA needs an effective forum for scientific experts to express independent scientific advice concerning both research and monitoring regarding the protection, conservation, management and use of the area. The panel comprises members

In the GBR, the Independent Expert Science Panel is comprised of a wide range of natural, cultural and social scientific experts with expertise in biophysical, heritage, social and economic disciplines. If a topic needs to be discussed in which there are other more informed experts than those on the Panel, then that expertise is sought and brought into the meeting, usually as temporary observers.

Any scientific advice should be seen as independent and non-partisan – but the scientists also need to understand that while such advice is a fundamental component necessary for MPA management, it also needs to be weighed up by the managers and decision-makers against other social, cultural and political information. Some of the items discussed by this panel include:

* the [Integrated Monitoring and Reporting Program](https://www.gbrmpa.gov.au/our-work/reef-strategies/reef-integrated-monitoring-and-reporting-program) (RIMREP);
* the [Water Quality Improvement Program](https://www.reefplan.qld.gov.au/about/);
* [Science for management](https://www.gbrmpa.gov.au/our-work/reef-strategies/science-for-management)

The members of this panel are also expected to identify knowledge gaps, interpret and disseminate scientific information, provide advice on emerging scientific issues facing the GBR, and help prioritise management actions (given there are never enough resources to do everything).

* 1. **Standing Committee of Officials**

In the GBR, a Standing Committee of Officials is comprised of senior officials from the Australian and Queensland governments; their role is to oversee implementation of the Reef Plan, facilitate coordination of Reef-related activities and report annually to the GBR Ministerial Forum. This group is fundamental to the integrated management approach, but much of their work is determined by the outputs from other panels or committees e.g., the Ministerial Forum or the Independent Expert Science Panel.

* 1. **Indigenous Advisory Committee**

Wherever there is a large number of Indigenous/First Nation peoples whose traditional lands/seas fall within or partly within an MPA, it is recommended that a specific Indigenous Advisory Group be established; such a committee needs to be run by Indigenous people, for Indigenous people, with activities occurring in a non-threatening environment and fully respectful of Indigenous views and concerns. The Committee needs to provide an effective forum for Indigenous peoples to express their views on matters affecting their country (land and sea) and the protection, conservation, management and use of the MPA.

In the GBR, the Indigenous Reef Advisory Committee provides advice to the Marine Park Authority Board (the Board) through the GBR Marine Park Authority (the Authority) on the management of the GBR Marine Park. The Terms of Reference can be found [here](https://www.gbrmpa.gov.au/about-us/reef-advisory-committees/indigenous-reef-advisory-committees).

Appointments to the Indigenous Reef Advisory Committee are competency-based, and members are appointed taking into consideration their experience, knowledge, skills, relationships and networks with Reef Traditional Owners or relevant groups or sectors. All Committee members are expected to adopt a broad perspective on Committee business that is raised.

The need for such an Indigenous Reef Advisory Committee is clear, given various international obligations (e.g., UN Declaration on the Rights of Indigenous Peoples), national undertakings (e.g., efforts by the federal Government to ensure that the unique rights, interests, and perspectives of Indigenous peoples are acknowledged, affirmed and implemented) and best-practice approaches adopted in many other WH properties.

* 1. **Local Marine Advisory Committees**

Park managers in the GBR quickly learnt that they did not always know as much about ‘their’ park as many of those who have lived around the Park for their whole lives, or who were in the Park regularly and who saw changes daily, seasonally and over decades. Managers did recognize, however, that if this knowledge could be effectively captured, it would provide a much broader and realistic perspective when it comes to effective decision-making.

As a result, local/community advisory committees were established in key populations centers along the GBR coast. Termed [Local Marine Advisory Committees](http://www.gbrmpa.gov.au/about-us/local-marine-advisory-committees) (or LMACs) in the GBR, their aim is to:

* improve the involvement and support of local communities in the managing the ecologically, socially and economically sustainable use, and the protection, conservation, management and use of the GBR; and
* provide for a two-way exchange of information between the Park and the community, enabling locals to raise issues of importance to them and their community but also providing the managers with a reliable and regular ‘conduit’ into the community.

Today there are twelve LMACs spread along the GBR coast who generally meet 5-6 times per year; all LMAC members are voluntary, but the Chair and Secretary are paid a small stipend for their efforts.

* 1. **Other effective governance arrangements in the GBR**

For further information about effective governance arrangements in the GBR, refer to:

* [Policies, position statements](https://www.gbrmpa.gov.au/about-us/legislation-regulations-and-policies/policies-and-position-statements), strategies and guidelines
* the [Environmental Management Charge](https://www.gbrmpa.gov.au/access-and-use/environmental-management-charge) (EMC)
* the [Guide for permit holders](https://elibrary.gbrmpa.gov.au/jspui/handle/11017/3812)
* [Reef Guardians](https://www.gbrmpa.gov.au/our-work/our-programs-and-projects/reef-guardians) programs
* [Field Management](https://www.gbrmpa.gov.au/our-work/field-management) programs
* [Responsible Reef Practices](https://www.gbrmpa.gov.au/access-and-use/responsible-reef-practices)
1. **Independent Review of the Governance of the GBR Marine Park Authority**

An *‘Independent Review of the Governance of the Great Barrier Reef Marine Park Authority’* was conducted in 2017 (Craik, 2017). It is available at: <http://www.environment.gov.au/marine/gbr/authority-governance-review>, and among the review’s 24 recommendations were:

* Recommendation #2: *The Ministers responsible* [for the environment and science] *should issue joint Statements of Expectations for the* [main management and research] *agencies* [associated withthe GBR]*, including objectives, clarification of relative roles and responsibilities and coordination of activities*
* Recommendation #10: *To ensure the Board has access to skills and expertise commensurate with its functions, the Board should* [be expanded to] *comprise seven members, consisting of:*
	+ *an independent part time Chairperson of integrity, national credibility and standing who would not be perceived as representing an interest group*
	+ *the CEO, and*
	+ *five members including continuation of the Indigenous, tourism and Queensland expertise and two members reflecting other skills, backgrounds, and geographic perspectives*.
* Recommendation #18: *The Authority… should develop a comprehensive Board charter* [which will be a public document] *including information on* [11 listed topics including] *Board values, considerations for decisions, frequency of meetings, the formation and operation of subcommittees, procedures for making decisions out-of-session, procedures for the declaration and management of conflicts of interest, performance reviews for the Board and its members.*
* Recommendation #24*: The Authority should seriously consider establishing a broad-based, high-level stakeholder consultative committee for the provision of advice on stakeholder perspectives on matters affecting the management of the Marine Park.*
1. **Other examples of good governance practices in Australia**

Various other effective aspects of governance within some of Australia’s World Heritage properties may be of interest:

Wet Tropics of Queensland:

* the actual legislation ([Wet Tropics Act](https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-1993-050)), including Schedule 1 (Management scheme/intergovernmental agreement for the Wet Tropics);
* the Wet Tropics [Research Strategy](https://www.wettropics.gov.au/site/user-assets/docs/wtma-research-strategy_2014_2018.pdf?nav_link=618) 2014-2018;
* the [Wet Tropics Regional Agreement](https://www.wettropics.gov.au/site/user-assets/docs/regional_agreement.pdf) (2005) covering the involvement of Aboriginal People in the management of the Wet Tropics.

Kakadu National Park:

* the [Plan of Management](http://www.environment.gov.au/system/files/resources/1f88c5a3-409c-4ed9-9129-ea0aaddd4f33/files/kakadu-management-plan-2016-2026.pdf) (particularly Section 4 - Joint management);
* the [Threatened Species Strategy](http://www.nespnorthern.edu.au/wp-content/uploads/2015/10/kakadu_strategy_-_31-10-14_0.pdf)

Shark Bay

* World Heritage [Strategic Plan 2008-2020](https://www.dpaw.wa.gov.au/images/documents/parks/management-plans/decarchive/shark_bay_whp_strategic_plan.pdf)

Ningaloo Coast Reserves

* Draft [joint management plan 2019](https://www.dpaw.wa.gov.au/parks/management-plans/draft-plans-closed-for-public-comment/542-nyinggulu-ningaloo-coastal-reserves-draft-joint-management-plan-2019)

Lord Howe Island

* [Biodiversity Management Plan](https://www.awe.gov.au/sites/default/files/documents/lord-howe-island.pdf)

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**Supplementary Information Table S1**

**Corresponding elements** **between the nine principles of good governance** (x-axis = Graham et al, 2003) **and the 19 attributes of good governance** (y-axis = Bennett & Satterfield, 2018)

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|  |  | **PARTICIPATION** | **CONSENSUS ORIENTATION** | **STRATEGIC VISION** | **RESPONSIVENESS** | **EFFECTIVENESS AND EFFICIENCY** | **ACCOUNTABILITY** | **TRANSPARENCY** | **EQUITY** | **RULE OF LAW** |
| **EFFECTIVE** | **Direction**  |  |  |  |  |  |  |  |  |  |
| **Coordination**  |  |  |  |  |  |  |  |  |  |
| **Capacity**  |  |  |  |  |  |  |  |  |  |
| **Informed**  |  |  |  |  |  |  |  |  |  |
| **Accountable**  |  |  |  |  |  |  |  |  |  |
| **Efficient**  |  |  |  |  |  |  |  |  |  |
| **EQUITABLE** | **Recognition**  |  |  |  |  |  |  |  |  |  |
| **Participation**  |  |  |  |  |  |  |  |  |  |
| **Fair**  |  |  |  |  |  |  |  |  |  |
| **Just**  |  |  |  |  |  |  |  |  |  |
| **RESPONSIVE** | **Learning**  |  |  |  |  |  |  |  |  |  |
| **Anticipatory**  |  |  |  |  |  |  |  |  |  |
| **Adaptive**  |  |  |  |  |  |  |  |  |  |
| **Innovative**  |  |  |  |  |  |  |  |  |  |
| **Flexible**  |  |  |  |  |  |  |  |  |  |
| **ROBUST** | **Legitimate**  |  |  |  |  |  |  |  |  |  |
| **Connected**  |  |  |  |  |  |  |  |  |  |
| **Nested**  |  |  |  |  |  |  |  |  |  |
| **Polycentric**  |  |  |  |  |  |  |  |  |  |

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1. The two governments have different interpretations of where low-water mark lies, and there are many other marine and coastal areas where differentiating federal and state waters would be extremely difficult (e.g., river mouths, internal waters, etc). Complementary zoning means the same legal frameworks apply in both the federal marine park and the adjoining State waters. [↑](#footnote-ref-1)