

PLANNING FOR RESILIENCE

How the Resilient Reefs Initiative partners with reef managers to develop a resilience strategy

Why Resilience?

From climate change to overfishing, pollution to invasive species and diseases, reef ecosystems – and the communities that depend on them – are facing unprecedented challenges.

As threats increase in scale and frequency, declines in reef health can impact local livelihoods, lifestyles and cultural connections, which undermine public trust in management effectiveness. In this way, managers are faced with the prospect of addressing multiple ecological, social, economic and governance issues, which are interacting in ways often beyond their control.

From a policy perspective, this complexity presents a range of challenges for planning and management. In many cases, root causes and potential solutions are beyond the jurisdiction of an individual management agency. Furthermore, the increasing pace and scale of change and uncertainty about the impacts on ecosystems and communities means that business-as-usual approaches for managing coral reefs are no longer sufficient.

As well as becoming comfortable with embracing a certain level of risk and uncertainty, management and planning now needs to be adaptive. That is, management needs to be trialling, implementing and refining solutions that address known threats, deliver positive outcomes to ecosystems and communities, and which are delivered in collaboration with stakeholders, Indigenous groups, and other partners. Managing for resilience provides a framework for innovation, integrated decision-making, collaboration and adaptability, allowing managers to support the ongoing health and functionality of ecosystems while also supporting communities in the face of uncertainty.

The Resilient Reefs Initiative (RRI), in partnership with managers around the world, is responding to this need and piloting a new approach to develop reef resilience strategies.

Reef Resilience

Reef Resilience is the capacity of reef ecosystems and the individuals, businesses and communities that depend upon them to survive, adapt and recover from the stresses and shocks that they experience.

The Reef Resilience Framework describes the building blocks for coral reef resilience, which includes: the reef ecosystem, the community that depends upon it, and the governance arrangement that determines how they interact. The Framework, like the Initiative, understands that resilience can only be built if all systems are strengthened.



ECOSYSTEM

The preservation of ecosystem services.

COMMUNITY

Maintaining or improving community wellbeing.

GOVERNANCE

The maintenance of robust and effective governance arrangements to support these outcomes.

How does a resilience strategy differ from business-as-usual?

In many ways, resilience-based management is an evolution of existing best practice. It seeks to enable management agencies to become more nimble and adaptive in response to rapidly changing conditions, to be more proactive in planning for threats, and more aware of the fundamental role that human behavior, socio-economic issues and community wellbeing play in achieving effective and holistic management outcomes.

Business as usual management approaches

Assumes that historical environmental conditions and baselines will persist in the future, and that ecosystems are stable in character and function

Assumes that risks and threats are already known

Is based around what an individual management agency can achieve/has responsibility for

Waits for scientific certainty before acting

Identifies the best possible solution to a problem and implements it

Is often focused on single-species or ecological management with limited integration of socio-economic planning

Resilience-based management approaches

Proactively plans for fundamental changes to environmental conditions and ecosystem character and function as a result of climate change and external stressors

Acknowledges the potential for new and emergent threats to impact the area in the future

Emphasises collaboration and partnership to address challenges holistically

Recognises the risk of doing nothing and the need to manage proactively in the face of fundamental uncertainty

Trials a range of potential solutions and monitors outcomes, refining activities as new information becomes available (“planning-by-doing”)

Seeks to maintain the functionality of ecosystems and communities, so that they retain their core values and continue to deliver ecosystem services to society

In this regard, there are a common set of principles that define a resilience approach, which include:

- **Embedding innovation**, experimentation, flexibility, adaptability and iteration into planning and management
- **A holistic and integrated approach** to addressing ecological, socio-economic and governance challenges
- **Broad, diverse and representative stakeholder engagement** and empowerment of the local community as active collaborators in planning and management activities
- **Partnerships and collaboration** in delivering actions which provide multiple benefits to the reef and the community

While the goal is a robust resilience strategy, a well-designed resilience planning process can actually be a resilience-building action in itself – educating key stakeholders about threats, identifying shared values and aspirations, empowering people to co-design solutions, fostering a sense of local stewardship and optimism, and building trust and cohesion between partners are all fundamental building blocks of a cohesive community and a resilient socio-ecological system.



RESILIENCE STRATEGY DEVELOPMENT PROCESS

What does a resilience strategy look like?

Developed through a robust, multi-stakeholder process based on global best practice, a resilience strategy will set a bold vision for the future, be innovative and integrated in its thinking, and will prioritise local short-and long-term solutions that will directly address the reef and reef community's vulnerabilities.

While there are common principles of resilience-based planning (outlined above), a resilience strategy needs to respond to the specific context, circumstances and challenges of each site.

What the strategy ultimately looks like for each site will vary. It could entail:

- A high-level policy framework
- A locally-endorsed framework for investment and partnership
- A dedicated management plan within an existing policy framework
- Revision of an existing management plan or strategic document
- An interactive website and investment prospectus, supported by detailed action plans

This process can be complex and robust, or relatively simple and streamlined, depending on the resources and needs of a given site. The following table outlines the steps, including a summary of objectives and outputs.



Strategy design stage	Objectives	Activities
<p>1. <i>Plan the process and establish local governance</i></p>	<p>Understand existing local governance arrangements and the stakeholder landscape and plan for strategy development. Gaining support from decision-makers, building coalitions and clarifying processes for input and approval at this stage are paramount to generating momentum, identifying opportunities for collaboration and alignment, and avoiding delays to funding and commencing actions.</p>	<ul style="list-style-type: none"> • Engage key partners to understand local context and approvals processes • Plan the strategy development process, and articulate its relationship to other planning processes • Establish a steering committee of key stakeholders for oversight and decision-making as well as local champions and validators
<p>2. <i>Engage broadly</i></p>	<p>Identify diverse values and draw on local knowledge to understand challenges and opportunities for reef management. Understanding local experience – including Indigenous knowledge – are key to understanding threats. Open and transparent engagement with members of the community builds trust and ownership of the eventual actions, as well as laying the groundwork for future partnerships and shared responsibility for implementation. While kicked off in Stage 2, in reality, stakeholder engagement occurs continuously throughout the strategy development process.</p>	<ul style="list-style-type: none"> • Identify and map stakeholders (including individuals, Indigenous Peoples and Traditional Owners, community groups, businesses, industry, government agencies and non-governmental organisations). • Deliver ongoing stakeholder engagement activities which are tailored to the stakeholder group (e.g. interviews, community workshops, focus groups, surveys, public forums or capacity-building activities, among others).
<p>3. <i>Assess resilience</i></p>	<p>Assess the resilience of the local ecological, socio-economic and governance systems, including key assets and resources, current and future vulnerabilities and threats, and the interdependencies between systems, utilising the Reef Resilience Framework. This integrated assessment analyses empirical data, past research, as well as information from community stakeholders, researchers, management agencies and First Nations people to understand and prioritise resilience challenges.</p>	<ul style="list-style-type: none"> • Review best available science and research • Collate and assess available monitoring data • Assess historical impacts of shocks and stressors • Identify current vulnerabilities and potential future threats • Review current management plans and governance arrangements • Generate a prioritised list of resilience challenges, integrating data and engagement, which can help to inform priority areas for co-design of actions
<p>4. <i>Develop actions</i></p>	<p>Identify, develop and prioritise solutions (actions) to the resilience challenges in partnership with stakeholders.</p>	<ul style="list-style-type: none"> • Engage stakeholders to identify desired outcomes and potential solutions • Prioritise identified actions • Produce initial project design with potential partners and/or funders

Strategy design stage

5. Develop the strategy

Objectives

Deliver an inspiring and actionable resilience strategy that will set a bold vision for the future, be innovative and integrated in its thinking, and result in short and long-term solutions that will directly address the reef and reef community's vulnerabilities. The strategy serves as a blueprint for action, partnership and investment by translating resilience challenges into goals, objectives and actions.

Activities

- Advance action co-design, focused on adaptive management techniques and strategies that will deliver multiple benefits for reef and community
- Design and draft the strategy
- Consult key stakeholders
- Sign-offs by the steering committee and relevant management authorities

6. Implement resilience actions

Deliver actions with a measurable impact on the reef and reef-dependent communities, as well as creating enduring partnerships, enhanced technical, financial and legal capacities within reef management agencies and communities, and greater ownership throughout the community.

- Implement holistic actions
- Embed RBM principles into management and planning structures
- Leverage external funding
- Deliver ongoing capacity building for reef managers and partners
- Connect and learn with and across project partners throughout delivery

1.2 Future Challenges for the Ningaloo Coast

In the next 20 years, the Ningaloo Coast is predicted to experience a range of pressures and challenges, including impacts of climate change, increased visitation and human pressures, as a result of a growing population and increase in tourism, and the potential for new onshore or offshore developments and industrialisation. Rising temperatures, localised human impacts and seasonal visitor pressures are occurring now. More frequent and intense marine

heatwaves and increased storm and cyclone intensity may be felt in the next 20 years, whereas rising sea level, ocean acidification and changes in ocean currents may be felt within the next 50 years. The real impacts of these changes are unknown. The potential impacts of pressures on the environment and community outlined below were developed through stakeholder consultation and review of relevant literature.

CHANGING CLIMATE



Environment	Community
<ul style="list-style-type: none"> Increased coral bleaching risk Potential for increased coral predation or diseases Changing species ranges and timing of biological events Possible decline in turtle populations if all hatchlings are born female 	<ul style="list-style-type: none"> Potential impacts on human health and wellbeing Potential impacts on tourism Increased seasonality of residency Potential increase in energy costs
<ul style="list-style-type: none"> Possible damage to reefs from increased wave action Increased coastal erosion if reefs cannot keep up with sea level rise Potential loss of seabird and turtle nesting areas 	<ul style="list-style-type: none"> Higher storm surge and related flooding Loss of recreation areas and property Change to cultural sites along the coast
<ul style="list-style-type: none"> Potential for reduced coral growth and increased reef fragility to storms Potential reduction in phytoplankton and zooplankton that support whale sharks and other marine species Altered patterns of recruitment / supply of larvae Changes in the natural range of species 	<ul style="list-style-type: none"> Decline in tourism if the reef is degraded Decline in tourism if whale shark aggregations are affected Changes in tourism activity if the reef is degraded

Not what, but how often: Coral reefs are inherently dynamic systems with an innate capacity for natural recovery from major disturbances like cyclones or marine heat waves. However, climate change is increasing not only the intensity of these disturbances, but also the frequency - reefs will face severe disturbances more often in the future, which will limit the time they have to recover.

The best available science predicts that Ningaloo Reef will experience severe bleaching events twice per decade by 2041, and annually by 2049¹⁰¹.

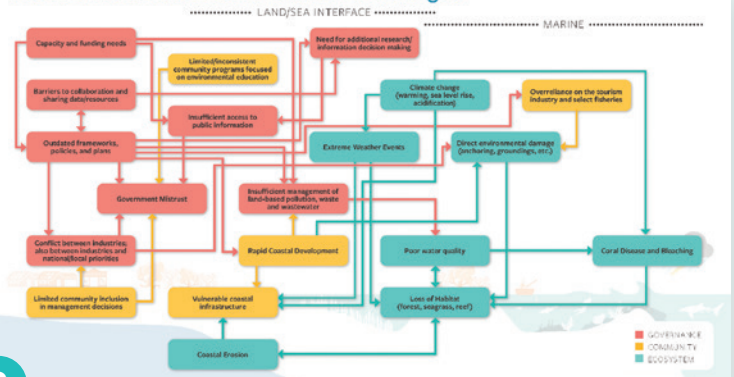
EXTREME EVENTS

HUMAN PRESSURES



<ul style="list-style-type: none"> Possible recurring mass coral bleaching Possible changes to seagrass and macroalgae habitats Possible changes to reproduction and recruitment of marine species Potential fish kills 	<ul style="list-style-type: none"> Damage to corals, seagrass, mangrove, macroalgal and coastal habitats Possible changes to recruitment and recruitment of marine species Possible changes to reproduction and recruitment of marine species Potential fish kills
<ul style="list-style-type: none"> Decline in tourism if major bleaching occurs Changes to fish populations, potentially affecting recreational fishing 	<ul style="list-style-type: none"> Decline in tourism if the reef is degraded Decline in tourism if whale shark aggregations are affected Changes in tourism activity if the reef is degraded

Interconnectedness of Resilience Challenges



1.

1. Example output from the Resilience Strategy for Ningaloo Coast.

2.

2. Example output from the Resilience Strategy for Belize Barrier Reef Reserve System.

Developing a resilience strategy requires moving away from business-as-usual approaches, and that can be hard work. The Resilient Reefs Initiative provides significant support to its partner sites throughout the development of their resilience strategy.

Support includes a dedicated delivery team that works with the site throughout development and can support the local effort in any number of ways from providing technical reviews, to facilitating connection to other managers, or delivering additional capacity for project management. In addition, sites receive technical guidance, tools, and templates on all stages of the work from stakeholder engagement to resilience assessment to action design. It provides access to experts, funding for engagement activities, as well as training or capacity-building opportunities for the local team. All of this support helps to address some of the key challenges to developing a resilience strategy, including lack of capacity within the local team, poor data or decision-support tools, or weak political will. It also provides managers with new thinking, new connections and new partners to help them try new approaches.



Learn more

Resilient Reefs Initiative: <https://www.barrierreef.org/what-we-do/projects/resilient-reefs>

Reef Resilience Network's Resilience-Based Management course: <https://reefresilience.org/online-training/>



The Resilient Reefs Initiative is partnering with communities across four World Heritage Reef sites. This six-year, AUD\$14 million program is a collaboration between the Great Barrier Reef Foundation, UNESCO, The Nature Conservancy's Reef Resilience Network, Columbia University's Center for Resilient Cities and Landscapes, Resilient Cities Catalyst and AECOM. The project is enabled by the BHP Foundation.



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