

# Reef Trust Partnership



Annual Work Plan 2019-2020



Australian Government

REEF TRUST



Great Barrier  
Reef Foundation

# Contents

<b>Preface</b>	<b>5</b>	<b>5 Traditional Owner Reef Protection Component – Annual Work Plan</b>	<b>43</b>
<b>1 Context</b>	<b>6</b>	Overview	43
A shared vision	6	Process to develop the Annual Work Plan	44
Partnership progress to date	6	Five-year plan	45
About the Annual Work Plan	7	Financial year 2019-2020 work plan	48
Cross-component Program Design and Co-benefits	7	Traditional Owner Reef Protection Component Monitoring and Evaluation	51
Partnership Innovation Activities	9	<b>6 Community Reef Protection Component – Annual Work Plan</b>	<b>52</b>
Measuring Partnership Performance	10	Overview	52
Partnership Governance and Decision-making	11	Process to develop the Annual Work Plan	53
<b>2 Water Quality Component – Annual Work Plan</b>	<b>13</b>	Five-year plan	54
Overview	13	Financial year 2019-2020 work plan	57
Process to develop the Annual Work Plan	17	Community Reef Protection Component Monitoring and Evaluation	60
Five-year plan	18	<b>7 Integrated Monitoring and Reporting (IMR) Component – Annual Work Plan</b>	<b>61</b>
Financial year 2019-2020 work plan	21	Overview	61
WQ Monitoring and Evaluation	24	Process to develop the Annual Work Plan	62
<b>3 Crown-of-Thorns Starfish (COTS) Control Component – Annual Work Plan</b>	<b>25</b>	Five-year plan	63
Overview	25	Financial year 2019-2020 work plan	64
Process to develop the Annual Work Plan	27	<b>Appendix 1.</b>	
Five-year plan	28	Alignment of Annual Work Plan with Reef 2050 Plan (July 2018) and Reef Trust Outcomes	66
Financial year 2019-2020 work plan	30	<b>Appendix 2.</b>	
COTS Monitoring and Evaluation	33	External parties consulted as part of the development of the Partnership Annual Work Plan	94
<b>4 Reef Restoration and Adaptation Science (RRAS) Component – Annual Work Plan</b>	<b>34</b>	<b>Appendix 3.</b>	
Overview	34	List of investment projects committed in financial year 2018-2019	101
Process to develop the Annual Work Plan	34	<b>Appendix 4.</b> Program logics for individual Partnership Components	108
Five-year plan	35		
Financial year 2019-2020 work plan	39		
RRAS Monitoring and Evaluation	42		

# Contents

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## List of figures

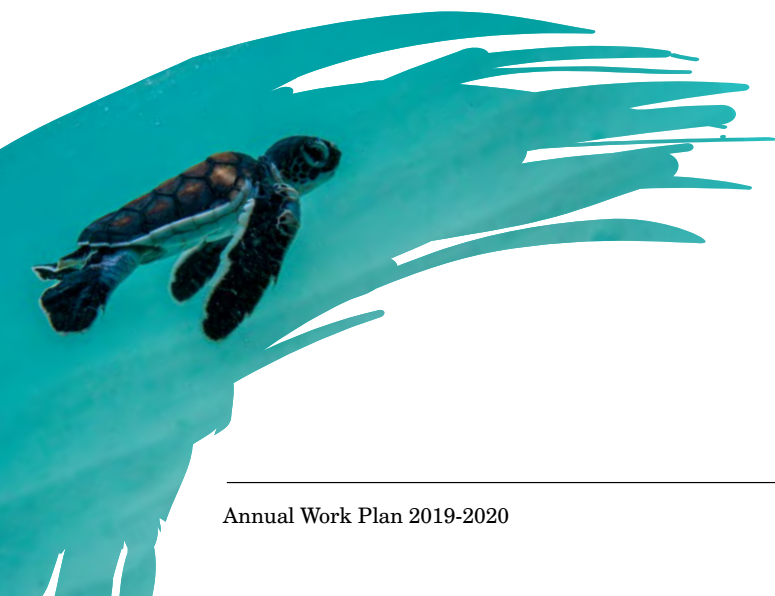
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<b>Figure 1.</b> The Annual Work Plan is one of a series of plans which underpins the Reef Trust Partnership	6
<b>Figure 2.</b> Overview of key interactions between Partnership Components	8
<b>Figure 3.</b> Partnership investment decision-making process	12
<b>Figure 4.</b> Funding allocations across WQ work streams	13
<b>Figure 5.</b> Water Quality Component five-year program overview and end of Partnership outcomes	16
<b>Figure 6.</b> Modelled progress towards DIN targets from regionally-focussed on-ground actions	19
<b>Figure 7.</b> Modelled progress towards FSS targets from regionally-focussed on-ground actions	19
<b>Figure 8.</b> Spatial representation of investments in regionally-focused on-ground actions	20
<b>Figure 9.</b> COTS Component five-year program overview and end of Partnership outcomes	26
<b>Figure 10.</b> RRAS Component five-year program overview and end of Partnership outcomes	36
<b>Figure 11.</b> Representation of co-design process for Traditional Owner Reef Protection Component	44
<b>Figure 12.</b> Community Reef Protection Component five-year program overview and outcomes	53
<b>Figure 13.</b> IMR Component five-year program overview and end of Partnership outcomes	62

## List of tables

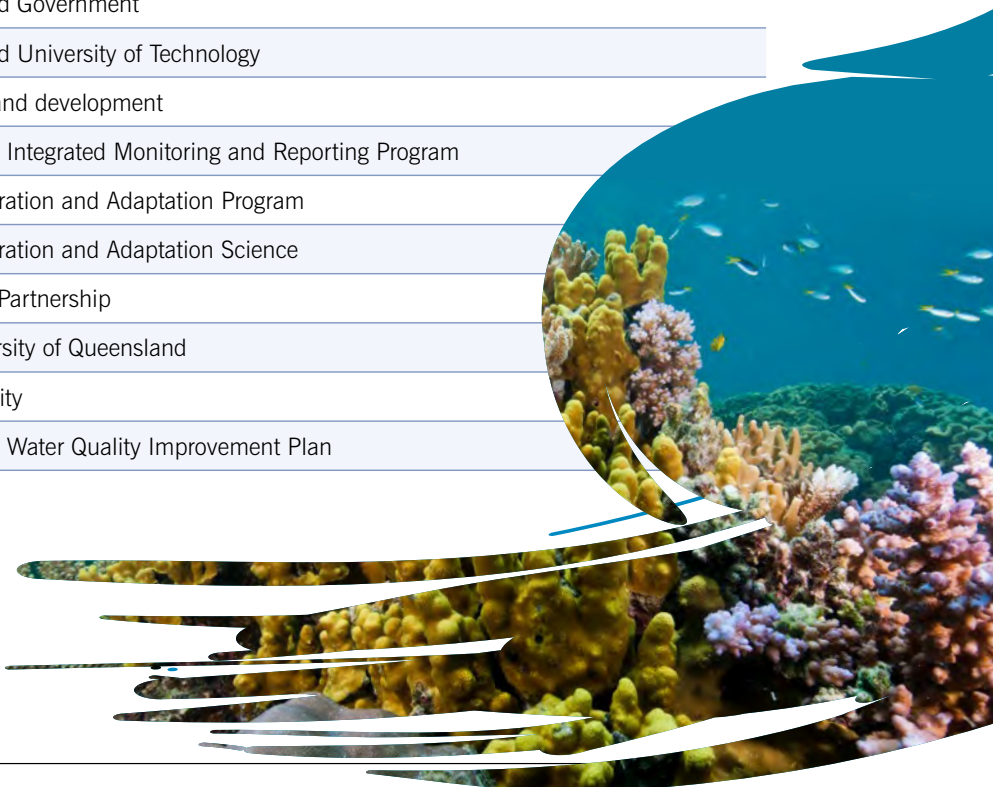
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<b>Table 1.</b> Water Quality Component five-year investment areas and budget	18
<b>Table 2.</b> Water Quality Component investment areas and budget for FY2020	21
<b>Table 3.</b> Water Quality Component Gantt chart for FY2020	23
<b>Table 4.</b> COTS Control Component five-year investment areas and budget	28
<b>Table 5.</b> COTS Control Component investment areas and budget for FY2020	30
<b>Table 6.</b> COTS Control Component Gantt chart for FY2020	32
<b>Table 7.</b> RRAS Component five-year investment areas and budget	37
<b>Table 8.</b> RRAS Component investment areas and budget for FY2020	39
<b>Table 9.</b> RRAS Component Gantt chart for FY2020	41
<b>Table 10.</b> Traditional Owner Reef Protection Component five-year investment areas and budget	45
<b>Table 11.</b> Traditional Owner Reef Protection Component investment areas and budget for FY2020	48
<b>Table 12.</b> Traditional Owner Reef Protection Component Gantt chart for FY2020	50
<b>Table 13.</b> Community Reef Protection Component five-year investment areas and budget	54
<b>Table 14.</b> Community Reef Protection Component investment areas and budget for FY2020	57
<b>Table 15.</b> Community Reef Protection Component Gantt chart for FY2020	59
<b>Table 16.</b> IMR Component five-year investment areas and budget	63
<b>Table 17.</b> IMR Component investment areas and budget for FY2020	64
<b>Table 18.</b> IMR Component Gantt chart for FY2020	65



## Acronyms

AG	Australian Government
AIMS	Australian Institute of Marine Science
COI	Conflict of interest
COTS	Crown-of-thorns starfish
DIN	Dissolved inorganic nitrogen
DSS	Decision support system
FSS	Fine suspended sediments
GBR	Great Barrier Reef
GBRF	Great Barrier Reef Foundation
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
IEP	Reef 2050 Independent Expert Panel
IFF	Innovative funding and financing
IMR	Integrated Monitoring and Reporting
JCU	James Cook University
LMAC	Local Marine Advisory Committee
MIPs	Major integrated projects
NESP	National Environmental Science Program
NRM	Natural resource management
PMC	Partnership Management Committee
QG	Queensland Government
QUT	Queensland University of Technology
R&D	Research and development
RIMReP	Reef 2050 Integrated Monitoring and Reporting Program
RRAP	Reef Restoration and Adaptation Program
RRAS	Reef Restoration and Adaptation Science
RTP	Reef Trust Partnership
UQ	The University of Queensland
WQ	Water quality
WQIP	Reef 2050 Water Quality Improvement Plan



## Preface

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The Great Barrier Reef (the Reef) is the largest living structure on the planet and is so large it can be seen from space. It's home to the most extraordinary array of animals and birds, and is often referred to as the rainforest of the sea. Sir David Attenborough describes it as:

*“one of the greatest, and most splendid natural treasures that the world possesses.”*

Today, however, the Reef is under threat from climate change and local stresses. We need the help of all Australians to protect and restore the Reef. Over the last two decades, the Great Barrier Reef Foundation (GBRF) has drawn together the many groups who are working to protect the Reef. There are hundreds of people and organisations working to achieve this including universities, research institutions, government agencies, scientists, traditional owners and community groups. The GBRF is the place where these myriad groups (large and small) come together to work on the highest priority projects which will have the greatest impact on protecting and restoring the Reef.

Our projects have had a measurable impact on the health of the Reef including monitoring reef health in near-real time (eReefs) to securing the future of green turtles on Raine Island (Raine Island Recovery Project), to developing the first portfolio of projects to address the resilience of reefs adapting to climate change. We also have a track record in innovation, developing solutions such as the RangerBot which detects and addresses threats to coral reefs.

Underpinning this partnership is a record government investment of \$443.3 million to tackle critical issues of water quality and crown-of-thorns starfish control, harness the best science to restore reefs and support reef resilience and adaptation, enhance Reef health monitoring and reporting, and increase community engagement on the Reef.

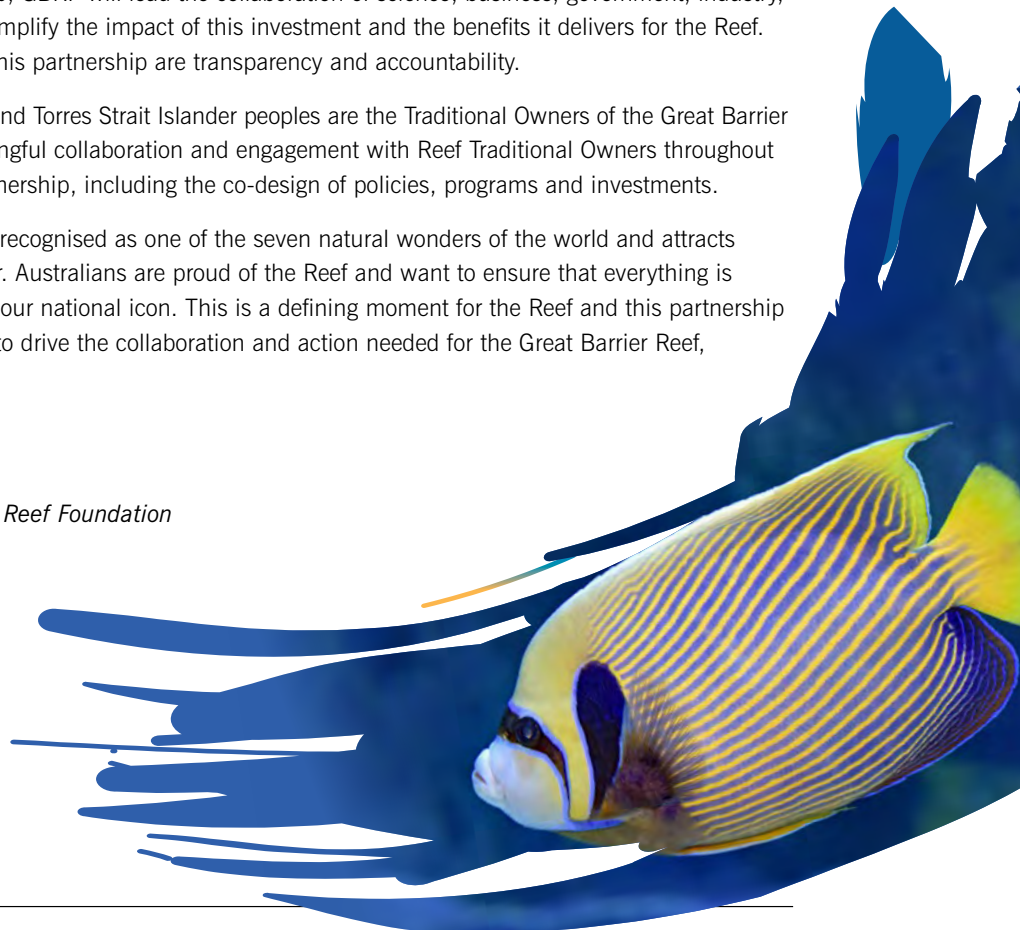
Through the Reef Trust Partnership, GBRF will lead the collaboration of science, business, government, industry, philanthropy and community to amplify the impact of this investment and the benefits it delivers for the Reef. Our guiding principles to deliver this partnership are transparency and accountability.

The GBRF recognises Aboriginal and Torres Strait Islander peoples are the Traditional Owners of the Great Barrier Reef. We are committed to meaningful collaboration and engagement with Reef Traditional Owners throughout the delivery of the Reef Trust Partnership, including the co-design of policies, programs and investments.

The Great Barrier Reef is globally recognised as one of the seven natural wonders of the world and attracts over two million visitors each year. Australians are proud of the Reef and want to ensure that everything is being done to protect and restore our national icon. This is a defining moment for the Reef and this partnership is an unprecedented opportunity to drive the collaboration and action needed for the Great Barrier Reef, now and for the future.

Anna Marsden

*Managing Director, Great Barrier Reef Foundation*



# 1. Context

## A shared vision

The Reef 2050 Plan provides the overarching framework and shared pathway for Traditional Owners, government agencies, industry, researchers and the broader community to work together for the future of the Great Barrier Reef (the Reef).

The Reef Trust Partnership (the Partnership) operates within the context of the Reef 2050 Plan, including the Reef 2050 Plan Investment Framework, and our approach embodies its principles for protecting the Great Barrier Reef World Heritage Area.

Each of the Partnership components is designed to deliver measurable improvements in the health of the Reef consistent with Reef 2050 Plan outcomes, targets and actions, including initiatives in the Great Barrier Reef Marine Park Authority's Reef Blueprint and actions under the Reef 2050 Water Quality Improvement Plan.

Appendix 1 maps relevant Reef 2050 Plan actions, targets, objectives and outcomes to each of the five Partnership components.

## Partnership progress to date

The first 12 months of the Partnership, in accordance with the Partnership Grant Agreement, have focused on putting in place the planning, systems, processes, people and tools required to effectively design and administer a \$443 million Reef Protection program. Key activities have included establishing governance arrangements and engagement pathways, developing the Collaborative Investment Strategy, designing the Monitoring & Evaluation framework and plan, and developing the Partnership Investment Strategy which provides the overarching Partnership priorities for the next five years (a full set of the eleven published RTP planning documents described in Figure 1 can be viewed on the GBRF website).

In addition to the foundational planning activities described above, \$25 million worth of projects have already been approved for funding across all components of the Partnership and are underway. These initial projects focus on building the capacity required for program implementation and maintaining momentum by providing continued support to projects that have demonstrated strong outcomes in key Partnership areas.

Figure 1. The Annual Work Plan is one of a series of plans which underpins the Reef Trust Partnership



## About the Annual Work Plan

The Annual Work Plan describes the activities and investments planned for financial year 2019-2020 to deliver on each of the priority Partnership Components included in the Grant Agreement. These activities are positioned in the context of the five-year investment profile summarised in each Component section, giving effect to the Partnership Investment Strategy released in January 2019, and program logics (Appendix 4) developed for each Partnership Component by the relevant working groups and in consultation with key stakeholders. Activities identified for financial year 2019-2020 do not preclude investment in other areas over the five-year life of the Partnership.

Critically, the 2019-2020 Annual Work Plan signals the shift from planning, to doing, with the majority of funding allocated over this period invested directly into projects and implementation, rather than the Partnership-level design focus during the first 12 months of the Partnership.

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*“ I just cannot bear the idea that future generations may not experience a coral reef. The mission is to start solving the problem, not just to study it.*

Vale, Dr Ruth Gates • 1962–2018

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## Cross-component Program Design and Co-benefits

One of the greatest opportunities presented by the Partnership is the ability to design an integrated program that considers all of the Components together, rather than in isolation. This ensures priorities around investments align (e.g. doing WQ work in locations that support COTS control, COTS control in locations that support restoration work, etc.) and allows for activities in one Component to leverage activities in other Components with the potential to deliver significant co-benefits. For example, many of the Components will develop modelling tools and when undertaken in the context of the Partnership these are being designed to fit the same agreed overall modelling architecture and design principles, ensuring that models can effectively connect with one another, providing enhanced utility. This also provides an opportunity to learn from and generate synergies in decision support and prioritisation strategies. Key interfacing points are represented in Figure 2.

This integrated approach also ensures that activities across all Components are designed to include the community and Traditional Owners resulting in greater local ownership, improved local capacity and enhanced social, cultural and economic, as well as environmental outcomes. This cross-component integration is evident in the individual Component-level annual plans provided in the following sections.

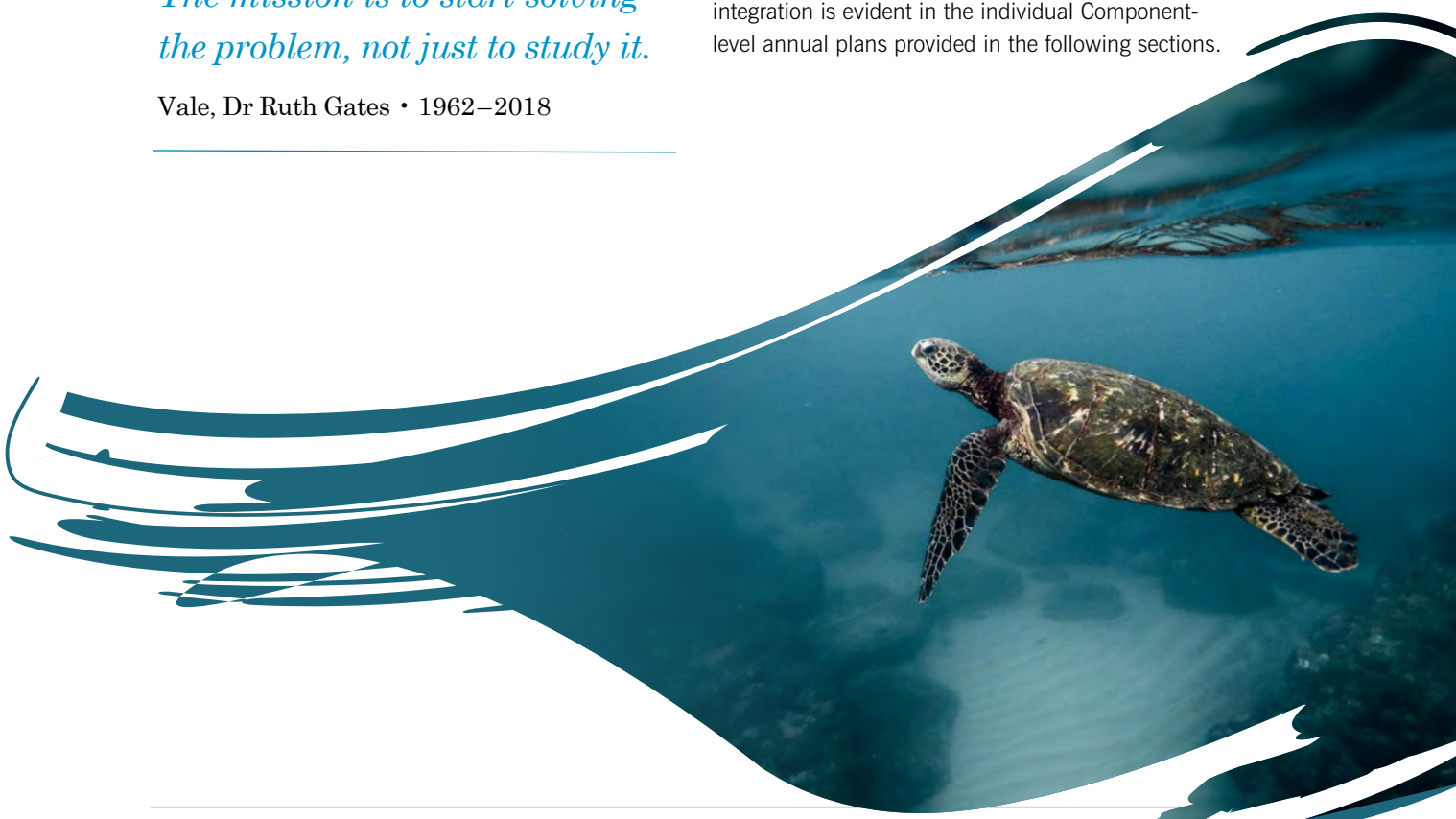
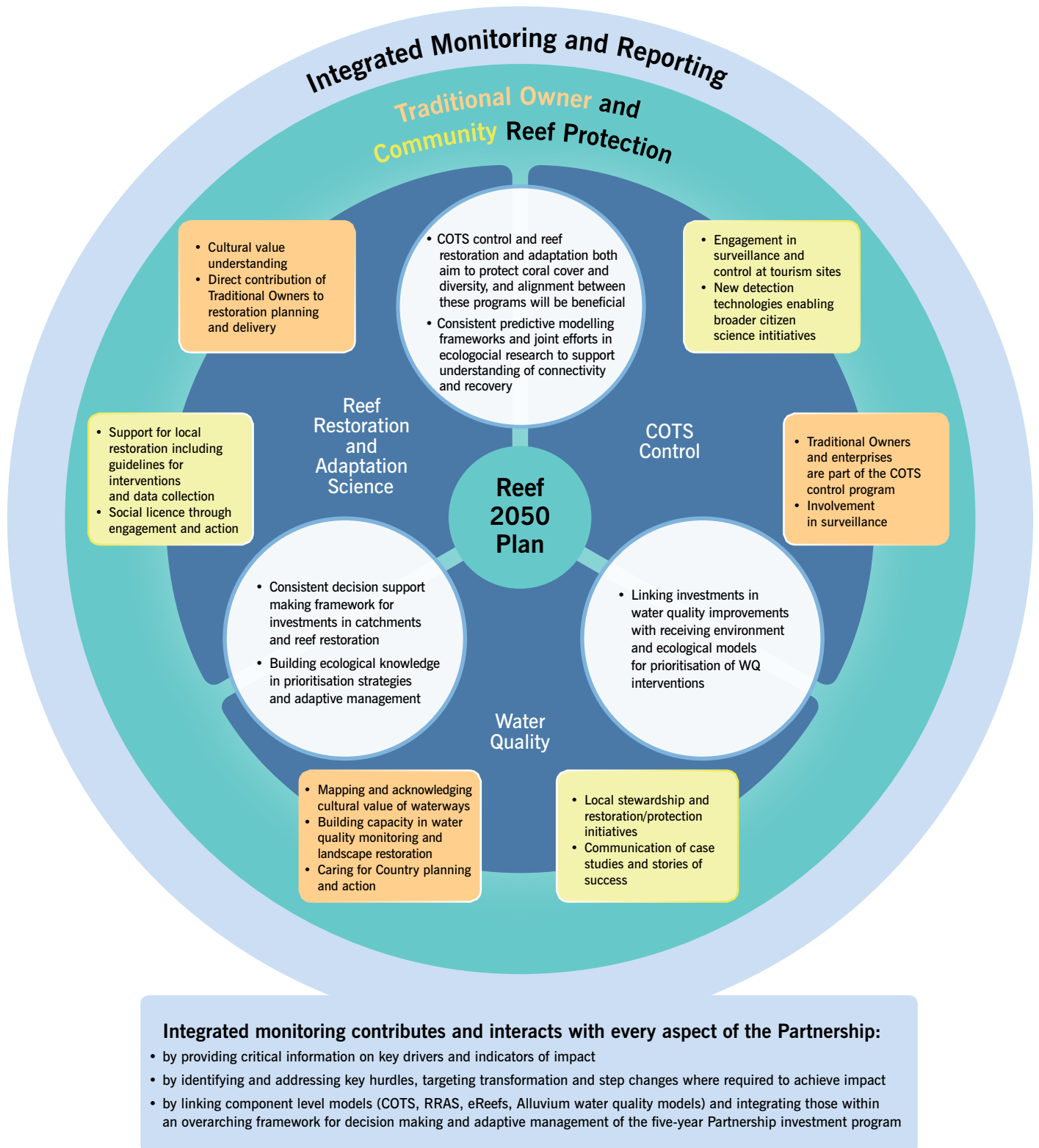


Figure 2. Overview of key interactions between Partnership Components





## Partnership Innovation Activities

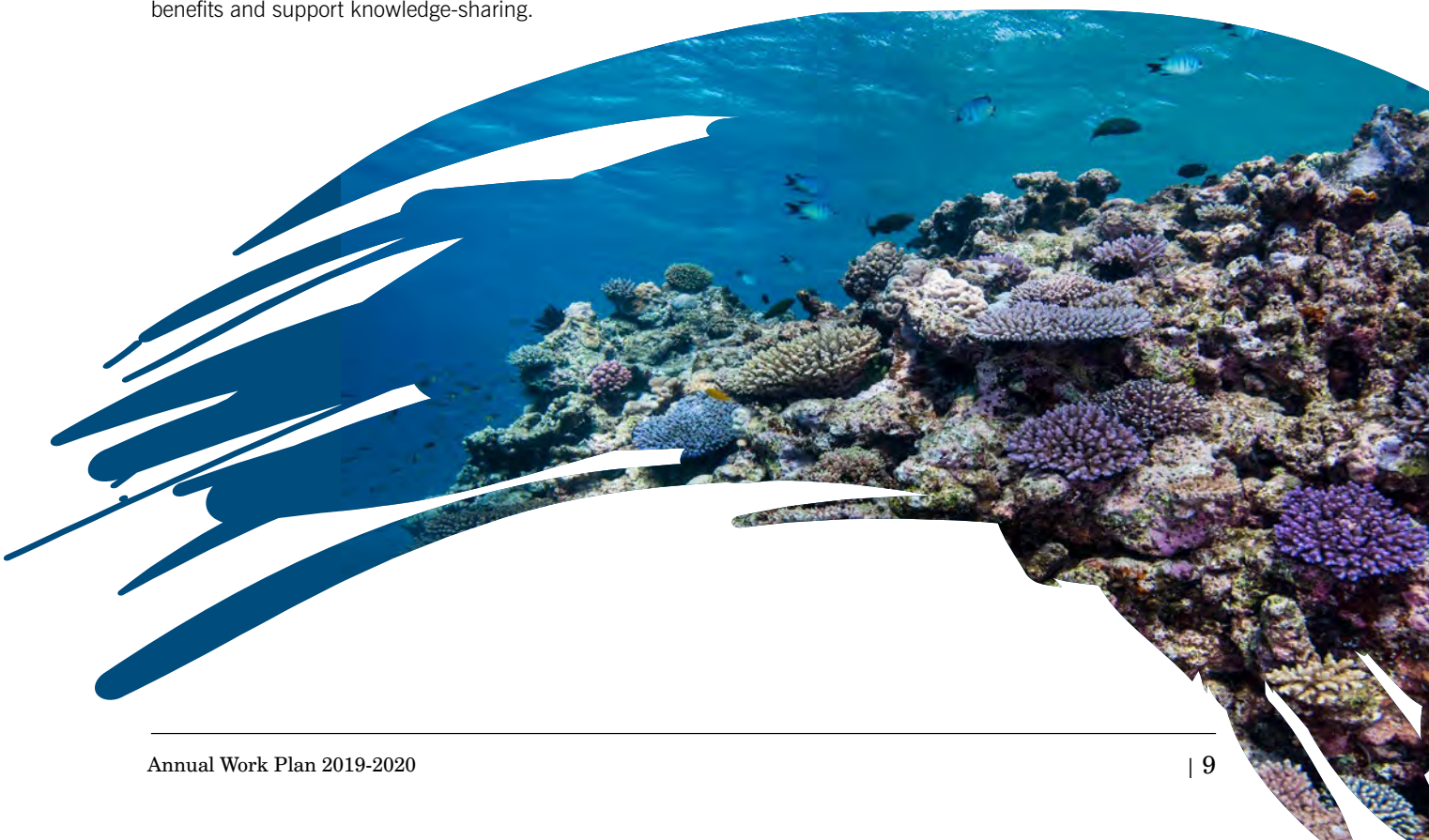
The Investment Strategy, published in January 2019, describes the overarching Innovation Strategy for the Partnership. It states that in the context of the Partnership innovation is an attitude to the design and delivery of projects ranging from optimising or scaling what we know already works through to complete step-change or transformation. Different Components present different innovation profiles but these are balanced when considered across the entire project Portfolio – e.g. the Water Quality (WQ) Component is focused predominantly on doing what we know works more effectively and efficiently whereas Reef Restoration and Adaptation Science is in itself an innovative and largely transformational research and development program.

While innovation is a core principle of the Partnership and will be embedded throughout the entire lifecycle of all projects within the Partnership, each Component has identified strategic innovation activities designed to change the status quo where current approaches are inadequate in scope or scale, or no solutions exist.

A number of delivery pathways will be utilised for strategic innovation projects including open funding rounds, innovation challenges and facilitated innovation forums that will be fit for purpose for each specific challenge requiring a transformative solution. Strategic innovation initiatives will be coordinated at the Portfolio level to maximise cross-Component benefits and support knowledge-sharing.

Strategic innovation focus areas over the next five years of the Partnership include driving step-change in:

- **Water Quality** – \$10 million investment for innovation relating to new systems, technology or innovative financing
- **COTS Control** – \$9.8 million investment focused on innovation in surveillance, early warning systems and interventions, decision support and alternative COTS control options
- **Integrated Monitoring and Reporting** – \$5 million investment for technology transformation, to be leveraged with an additional \$5 million contribution from non-government funds.
- **Community and Traditional Owner Reef Protection** – Innovation areas are likely to focus on social entrepreneurship, leadership and governance and will be refined through community and Traditional Owner co-design processes.
- **Reef Restoration and Adaptation Science** – This entire Component is a strategic innovation initiative in its own right, so no standalone innovation activities have been identified within this Component.



## Innovative Funding and Financing (IFF)

To achieve enduring and accelerated impact the current Reef funding environment needs to expand to include self-sustaining finance mechanisms, access to new funding sources and approaches that optimise the impact and outcomes for the Reef from existing funding. The Partnership provides an unprecedented opportunity for exploring and piloting innovative funding and financing options. Over the next five years this work will focus on:

- Building Australian capacity and expertise in relation to innovative funding and financing solutions relevant to the Reef context. This will include convening expert forums, sharing knowledge to reduce barriers to entry and funding strategic research related to the operational and financial feasibility of IFF approaches to address Reef 2050 Plan funding needs.
- Supporting and growing innovative finance and funding solutions that align with the priority activities and impact areas of the Partnership through funding feasibility studies, setup and establishment costs, and piloting of potential IFF solutions to improve their operation and demonstrate them to the market.
- Partnering with Queensland agriculture, manufacturing and industrial sectors and with local councils and Natural Resource Management (NRM) organisations to increase recognition of the economic value of Reef protection amongst business and local communities. This would include investigating the potential for: optimisation in agricultural supply chains; new markets in 'Reef-friendly' products; and market-based incentives (such as reef credits); and markets for co-benefits (such as carbon sequestration or Indigenous employment).
- Establishing a Reef Traditional Owner Futures Fund to provide ongoing support for Traditional Owner Reef Protection governance and on-ground activities.

In FY2020 innovative funding and financing activities will commence in quarter three of 2019 with an expert workshop. This workshop will focus on IFF opportunity identifying and establishing sub-networks that can collaborate in developing IFF solutions that enhance the Reef 2050 Plan outcomes. Additional FY2020 focus areas will include an open funding round for feasibility assessment or piloting of potential new IFF options and establishing the Reef Traditional Owner Futures Fund.

## Measuring Partnership Performance

A robust methodology to assess the performance of the Partnership is required which demonstrates the contribution of the Partnership to the Reef 2050 Plan and to the expected outcomes specified in the Grant Agreement. To achieve this, a monitoring and evaluation framework has been developed along with a suite of Component-level key evaluation questions, as detailed in the Monitoring and Evaluation Plan (Stage 2) published in April 2019. This plan, which was developed in consultation with key stakeholders, experts and Traditional Owners, addresses monitoring and evaluation requirements in relation to the outcomes of the Partnership and its specific components (the 'what') as well as the principles and approaches to achieve these outcomes (the 'how').

A detailed and robust set of performance measures for each Component are part of the Final Monitoring and Evaluation Plan (Stage 3), developed with further consultation and informed by this Partnership Annual Work Plan and Component-specific plans. Specifically, the Final Monitoring and Evaluation Plan includes performance expectations (overall and detailed indicators and qualitative and quantitative targets), specific data collection requirements (sources, methods) and evaluation processes.

The performance of the Annual Work Plan will be reviewed against these performance measures and this assessment will be used to guide the development of the next Annual Work Plan – following an adaptive management approach. This provides a clear process for continuous improvement of the program which will be further supported by adaptive program design elements such as the inclusion of project reviews and stage gates.

A significant body of data will be collected through the monitoring and evaluation process and as part of the delivery of Partnership activities. The intent of the Partnership is to make such data readily available to the broader community whenever possible.

## Partnership Governance and Decision-making

A plan describing the governance arrangements for the Partnership was published in September 2018. This describes the Partnership-level governance arrangements including the roles and responsibilities of the Partnership Management Committee (PMC), the GBRF Board and the Component-level Working Groups. It also details the overarching governance principles of the Partnership which are:

- clearly defined roles, responsibilities and accountability
- an emphasis on integrity and transparency
- using, building on and aligning with existing governance arrangements, wherever practicable
- planning and reporting consistently and regularly on performance
- communicating effectively with the community, our partners and with government
- being inclusive and respecting and acknowledging Traditional Owners, and
- clear processes for identifying and managing risks, emerging issues and perceived or actual conflicts of interest.

As the Partnership transitions into full implementation it will be necessary to establish fit for purpose governance arrangements at the Component, or project, level. This appears as an early activity in all 2019-2020 Component-level Plans below. In all instances the Component- and project-level governance will be consistent with the governance principles above and nest within the overarching Partnership governance framework.

Since publishing the Governance Arrangements Plan a rigorous conflict of interest (COI) process has been established as has a more detailed decision-making process regarding how Partnership funds are awarded. Details of these are provided below and in Figure 3. These arrangements and the transparency they bring will ensure the Partnership remains continuously open to new ideas and new participants.

At this early stage the Partnership is not in a position, in most instances, to identify specific delivery models or providers. This is consistent with the principles of applying transparent processes for allocation of funding and projects, and acknowledges that co-design and collaboration will play a key role in ensuring the success of the Partnership. Component-specific funding approaches will be identified and are likely to range from open calls for project proposals and direct negotiation (e.g. delivery of COTS control program by GBRMPA), to establishing strategic collaborative initiatives with clearly defined goals (e.g. reef restoration and adaptation program, model similar to major integrated projects for WQ improvements).

Conflict of Interest process steps:

- All GBRF Board, PMC, Component-level Working Groups and Independent Assessment Panel members, as well as peer reviewers, complete a conflict of interest declaration.
- The COI declaration is assessed by the GBRF Risk and Compliance Manager.
- If a real or perceived COI is identified a risk management plan is put in place. In some instances, this will completely exclude individuals from being part of specific decision-making or assessment processes.
- COI is a standing agenda item on all GBRF Board and PMC meetings.

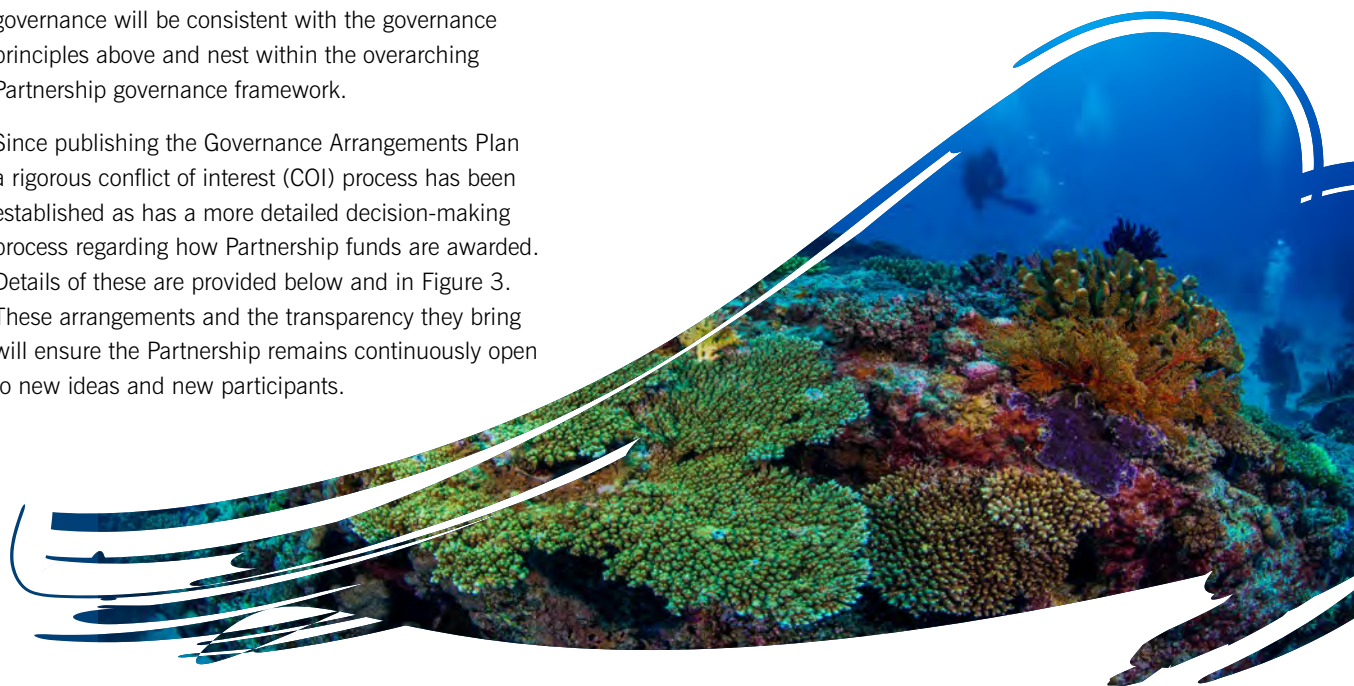
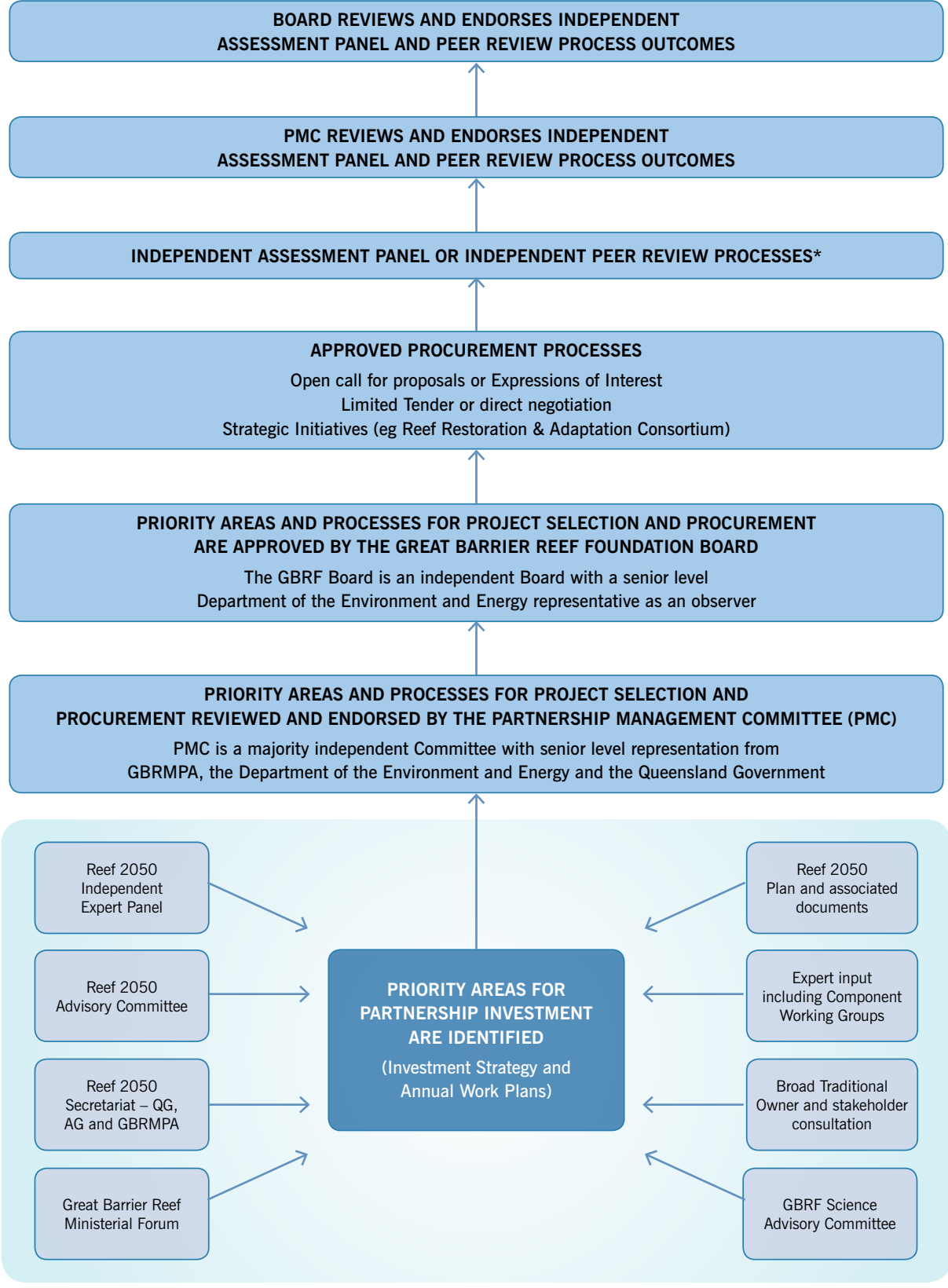




Figure 3. Partnership investment decision-making process



\* This includes international experts wherever appropriate

## 2. Water Quality Component Annual Work Plan

**Budget:** \$201 million

**Purpose:** To address water quality improvement targets impacting the Great Barrier Reef World Heritage Area through activities such as improved farming practices, reduced fertiliser user and uptake of new technology and land management practices.

### Priorities under the Partnership Investment Strategy:

<span style="color: blue;">●</span>	Investment in on-ground actions
<span style="color: yellow;">●</span>	Systems level change and innovation

### Overview

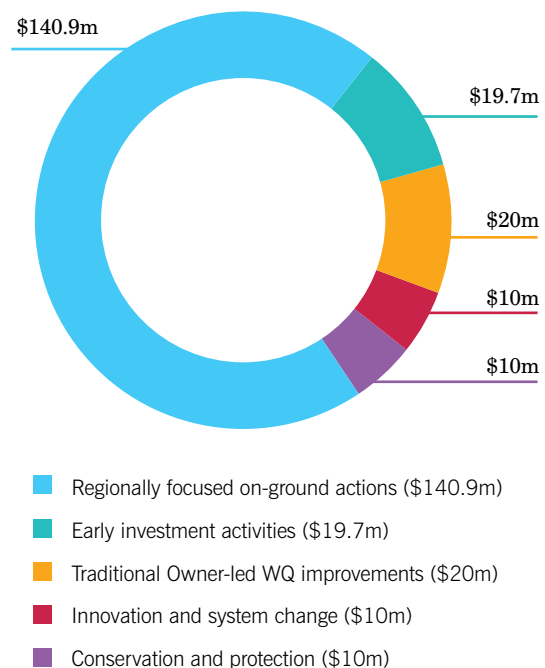
The decline of marine water quality associated with land-based run-off from the adjacent catchments is a major cause of the current poor state of many of the coastal and marine ecosystems of the Great Barrier Reef. Improving water quality is expected to play an important role in improving ecosystem resilience. The objective of the Partnership Water Quality Component is to deliver measurable progress towards the Reef 2050 Water Quality Improvement Plan long-term outcomes, objectives and targets. A five-year investment plan has been developed for the WQ Component which aims to address the three priority pollutants in the Reef 2050 Water Quality Improvement Plan (WQIP) – dissolved inorganic nitrogen (DIN), fine suspended sediments (FSS), and pesticides.

Consistent with the Investment Strategy, a significant focus of the plan is to build on the actions and approaches with demonstrated success, seeking to accelerate impact by focusing on scale and the efficiency and effectiveness of actions, while also identifying innovative delivery strategies where this is required to achieve Partnership goals. More than 85% of funding under the WQ Component will be allocated to on-ground actions. These will aim to build and improve on previous initiatives, focusing on the most cost-effective interventions in highest priority locations.

Funding set aside for on-ground actions includes:

- \$19.7 million already contracted under the Reef Water Quality Improvement Grant Program Stage 1, with a focus on maintaining and building on-ground delivery capacity ('2018-2019 investment activities'). This grant round prioritised funding for established service providers to implement proven approaches for improving water quality.
- \$140.9 million to be invested in catchments identified in the WQIP as high and very high priorities with the aim of achieving material and enduring reductions in the long-term end of catchment pollutant loads.
- \$10 million allocated to catchment protection and conservation measures aimed at maintaining water quality, particularly in less-disturbed catchments.

**Figure 4.**  
Funding allocations across WQ work streams



The WQ program aims to achieve the reduction in catchment pollutant loads through (i) improving landscape function, such as through catchment restoration, and (ii) improving land management practices, including through improved stewardship. The program logic is described in detail in the Partnership Final Monitoring and Evaluation Plan.

Data on previous WQ projects suggests that interventions related to improving farming and land management practice change (particularly in the sugarcane and grazing sectors), together with gully and streambank restoration, are likely to be the most cost-effective interventions available in priority locations. In addition, the conversion of some of the least productive agricultural land into conservation areas, on a voluntary basis and potentially linked to wetland restoration efforts, has been identified as a cost-effective option in some locations for securing permanent reductions in DIN and pesticides. The reduction in agricultural production would be minimised through limiting the extent of any land use change, prioritising the least productive land, and favouring improved land management practice as an alternative where feasible.

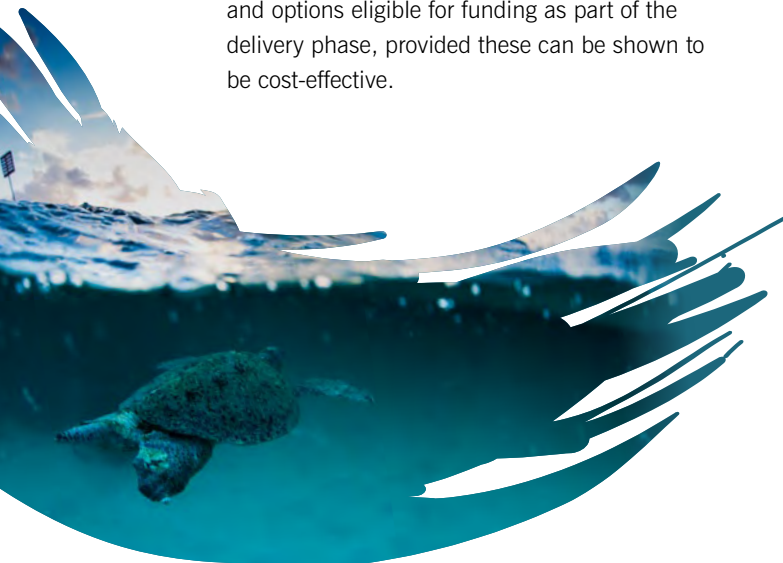
Based on the most cost-effective actions available, modelling has been used to predict pollutant reduction outcomes associated with region-specific on-ground actions<sup>1</sup>. While priority interventions have been identified and predicted WQ improvement outcomes modelled assuming a certain level of cost-effectiveness, there will be no limit to the types of actions that could be funded, with all sectors and options eligible for funding as part of the delivery phase, provided these can be shown to be cost-effective.

While on-ground actions are expected to involve a mix of tried and tested and innovative approaches, a further \$10 million will specifically support system-level change and innovation. This funding is designed to catalyse and accelerate change where it is necessary to maximise impact and to improve the effectiveness, efficiency and sustainability of on-ground actions; to better track the outcomes of investments; and remove barriers to change. This funding includes support for:

- Identifying and trialling new WQ improvement technologies, with a focus on approaches that address the most critical needs in terms of lowering costs and improving the efficacy of interventions;
- Providing the tools to support system-level change, including new (user-owned) data systems to unlock the value of data on land-use practices and impacts; improving approaches to providing technical support and knowledge exchange; expanding precision agriculture and related decision-support systems; and creating new opportunities for financing WQ interventions, including through improved abilities to value the environmental, economic and social benefits associated with good land management practices; and
- Reef-wide or regional planning/mapping initiatives to better guide future WQ improvement actions.

Consistent with the commitment under the Investment Strategy to allocate 10% of the total value of the partnership to Traditional Owner Reef protection initiatives, \$20 million has been allocated to Traditional Owner water quality improvement initiatives. The objectives and strategy related to this funding will be determined through a Traditional Owner-led planning process.

All actions funded under the WQ Component will be designed and implemented consistent with the WQIP objectives, and to maximise synergies between different work streams. The relationship between the different work streams is shown in Figure 5.



<sup>1</sup> Alluvium 2019. Effective and Efficient Pathways for Investment in Improved Water Quality in the Great Barrier Reef: Final Report. A report for the Great Barrier Reef Foundation, Brisbane.

Phasing of activities is required to ensure that adequate planning and consultation is undertaken, and to maximise opportunities for alignment or collaboration with existing programs. Phasing will be undertaken in a way that recognises:

- The time required for activity or regionally-based planning;
- Delivery constraints, at the WQ Component and catchment levels; and
- Other major ongoing investments in water quality improvements, such as the Major Integrated Projects, and the need to learn from these programs and achieve alignment in terms of timing, governance, participation and delivery strategies.

Subject to these constraints, activities in financial year 2019-2020 have been identified to allow for all work streams to commence, ensuring that the foundations are established to allow for the Component to deliver the full program of works within the five years available for implementation.

The approach to project delivery for each work stream will be determined on a case-by-case basis and will strike a balance between (i) maintaining a competitive tension in the granting of funds and (ii) the value of maintaining or establishing collaborative partnerships, especially where there are limited delivery partners available.

For major on-ground programs, it is expected that contracts for these will cover most or all of the five-year delivery period, to maximise the efficiencies and other benefits associated with a longer program. Key review points will be maintained to allow for adjustments where necessary. Innovation and System Change activities are expected to be shorter in duration (e.g. 1-2 years).



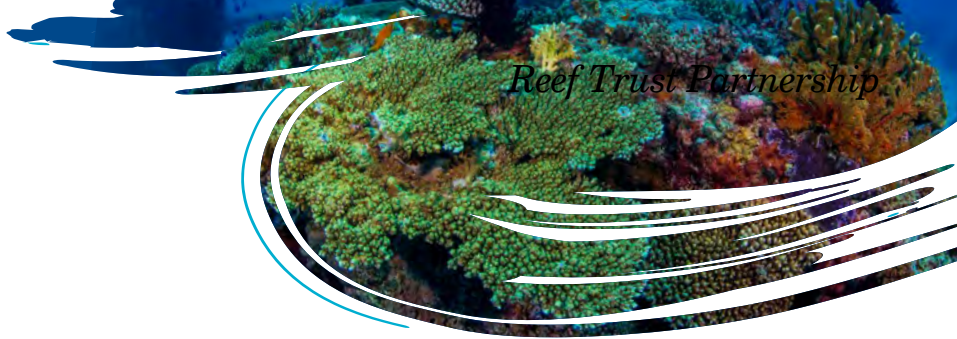
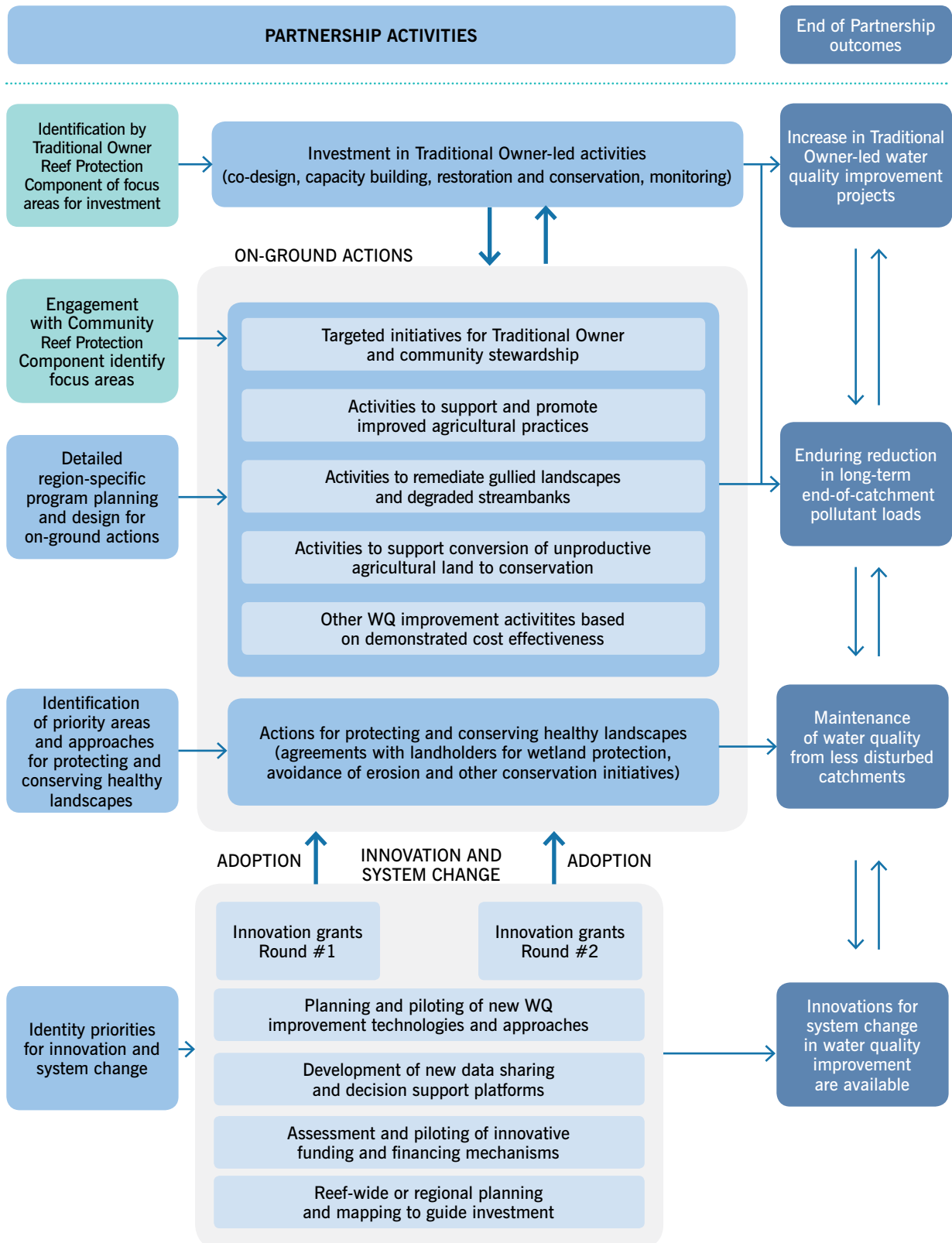


Figure 5. Water Quality Component five-year program overview and end of Partnership outcomes





## Process to develop the Annual Work Plan

As an early step in the process, a number of strategic decisions were made on the overall allocation of funding. These are reflected in the funding allocations shown in Figure 4. Specifically, the quantum of funding for Innovation and System Change (\$10 million) represents approximately 5% of the total funding, which is consistent with the nature of this Component where the majority of the investment is designed to build on existing programs and well understood strategies. In addition, this investment in innovation lends itself to leveraging from the private sector.

Investment decisions on what to fund and where over a five-year period, and within this Annual Work Plan, have been made following a detailed assessment process, which included modelling the long-term costs and benefits associated with different investment options.

Priority areas for funding on-ground actions were determined by:

- Identifying potential interventions, including the cost and efficacy of different approaches, their availability in different catchments, and the extent to which they could contribute towards achieving the WQIP targets.
- Constructing a series of 12 different investment scenarios, which reflected different ways for allocating the available funds across catchments and between different interventions.
- Adopting a structured decision-making process to identify a broad set of values and objectives that were relevant to assessing different investment scenarios. This involved engaging a range of stakeholders, including through a survey process, to validate the values and objectives and to assess their relative importance.
- An expert panel assessing the 12 investment scenarios, as a basis for resolving a range of strategic investment decisions, such as the extent to which funding should strike a balance (i) between investing in the highest priority locations vs. investing in the most cost-effective interventions, as well as (ii) how to allocate funding across different target pollutants (i.e. DIN vs. FSS vs. pesticides).
- Developing the final investment scenario, based on that assessment, together with consideration of various risks and delivery considerations associated with the scenario.

Priority areas for funding in the Innovation and System Change work stream were identified through extensive consultation across a range of stakeholders.



## Five-year plan

Major categories of activity, rationale and budget for the five-year period are shown in Table 1.

Table 1. Water Quality Component five-year investment areas and budget

Partnership Activity	Rationale	Outcome	Budget
<b>(existing commitments are shaded)</b>			<b>TOTAL INVESTMENT \$200.6m</b>
● 2018-2019 year investment activities	A need was identified to address existing delivery capacity constraints for on-ground activities, as well as mitigate the risk of losing current extension and delivery staff during the program development phase. The need for catchment-level modelling of the cost and effectiveness of on-ground actions was an essential element of investment planning.	Maintain/build on-ground capacity across moderate, high and very high priority catchments to support program implementation, while also reducing pollutant run-off.  Alluvium report on investment pathways and online interface for development and assessment of investment scenarios.	\$19.7m
● Regionally-focussed on-ground actions	<p>Limited funding relative to the total cost of achieving the WQIP objectives requires a strategic and targeted approach to addressing the highest priority pollutants in the highest priority catchments.</p> <p>There is now significant experience in implementing water quality improvement activities, although a more targeted approach is required that adopts the most cost-effective actions, improves upon them, and extends adoption.</p> <p>Investments in specific catchments have been determined by a detailed technical assessment, supported by a decision-making process that considered a range of value drivers and objectives.</p>	Reduce DIN runoff in Wet Tropics (Johnstone, Tully, Mulgrave Russell, Herbert), Burdekin (Lower Burdekin/ Haughton), and Mackay-Whitsunday (Plane Creek) regions, primarily via practice change related to fertiliser and irrigation management in the sugarcane industry.	\$62.1m
		Reduce anthropogenic FSS runoff from the Burdekin (Bowen Bogie, Upper and East Burdekin), Wet Tropics (Herbert River), Fitzroy (Lower Fitzroy and Mackenzie), and Burnett Mary (Mary River) regions, including through restoration of the landscape (gullies and streambanks) and improved management of grazing lands.	\$63.8m
		Reduce pesticide runoff in Burdekin (Lower Burdekin/Haughton), and Mackay-Whitsunday (Plane Creek and Pioneer River) regions, including through practice change, particularly in the sugarcane industry.	\$15m
● Conservation and protection of less disturbed catchments	This mitigates the risk of degradation of less disturbed catchments and relies on the expectation that prevention and early intervention are more cost-effective than repair.	Avoided degradation of the quality of water entering the Reef, particularly from less-disturbed catchments, and contribution to land stewardship objectives.	\$10m
● Traditional Owner-led Reef protection initiatives	Protect and maintain culture and heritage values for water sources (including cultural flows). Diversification of skillsets/capacity building – improved inclusion. Refer to Table 10. This budget figure is also accounted for in the Traditional Owner Reef Protection Component.	Direct investment in Traditional Owner Country based planning and management for improved WQ outcomes; improved capacity and opportunity for Traditional Owner enterprises to become engaged in WQ programs; Cultural value recognised in protection and improvement efforts.	\$20m

Partnership Activity	Rationale	Outcome	Budget
(existing commitments are shaded)			TOTAL INVESTMENT \$200.6m
● Innovation and System Change	There is a need for a transformational change in how WQ improvement activities are designed, funded, and implemented to support enduring and self-sustaining improvements at sufficient scale.	New systems, technologies, and financing options available to support WQ improvement activities and achieve enduring impact.	\$10m
TOTAL INVESTMENT			\$200.6m

For the investment in regionally-focussed on-ground actions, anticipated reductions in loads of DIN, FSS and pesticides have been estimated using the cost and benefit modelling framework underpinning the investment scenarios<sup>1</sup>. Predicted load reductions in DIN and FSS, together with the remaining load reductions that would be needed to achieve the WQIP targets, are shown in Figure 6 and Figure 7.

Only reductions in pollutant loads associated with the regionally-focussed on-ground actions are shown and it is anticipated that further progress towards the targets will be achieved by other activities shown in Table 1. However, the anticipated pollutant load reductions associated with these activities cannot be modelled until these are scoped in more detail. Similarly, the progress towards targets do not account for load reductions which could be expected from current programs (such as the Major Integrated Projects or MIPs).

In the case of activities targeting a reduction in DIN, the modelling assumes that sugarcane land currently classed as high-risk (commonly referred to as 'D') under the Reef Plan 2013 Sugarcane Water Quality Risk Framework will transition to moderate risk ('C') at no cost to the Partnership as a result of proposed strengthening of existing Reef protection regulations through the Environmental Protection (Great Barrier Reef Protection Measures) and Other Legislation Amendment Bill 2019. The predicted (modelled) progress towards the WQIP targets associated with this regulated improvement in practice is shown in Figure 6.

Figure 8 provides a spatial overview of areas targeted under regionally-focussed on-ground actions.

Figure 6. Modelled progress towards DIN targets from regionally-focussed on-ground actions

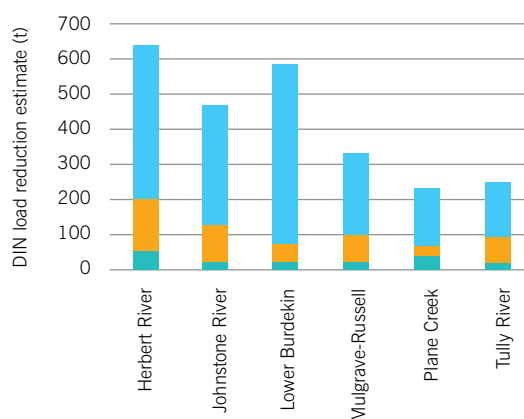
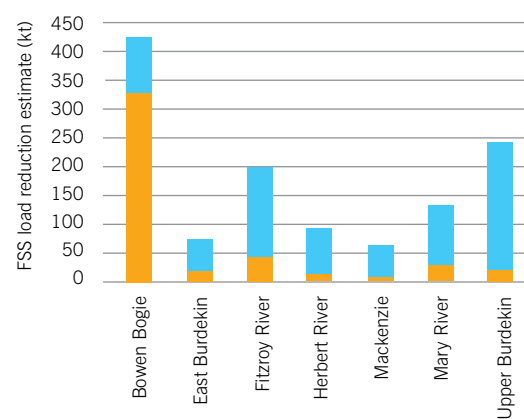


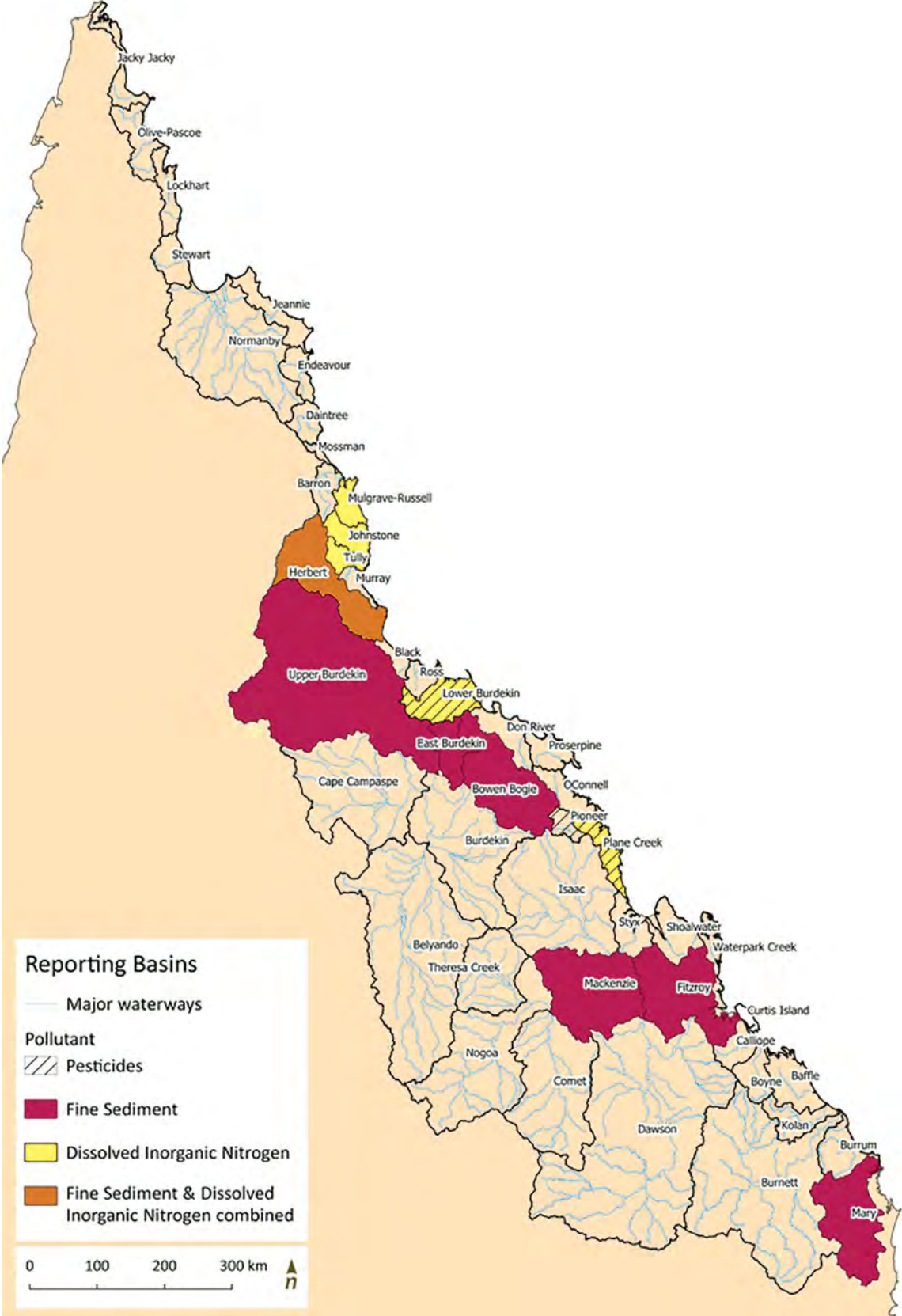
Figure 7. Modelled progress towards FSS targets from regionally-focussed on-ground actions



- Load reductions attributed to RTP investment.
- Remaining load reductions to achieve WQIP targets.
- For DIN only, the contribution of proposed changes to the Reef protection regulations to the load reductions (based on this specific scenario).



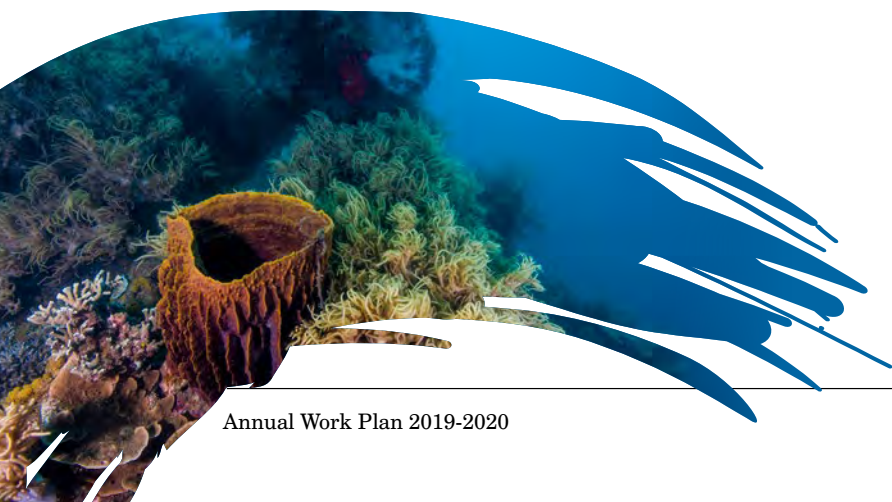
Figure 8. Spatial representation of investments in regionally-focused on-ground actions



## Financial year 2019-2020 work plan

Table 2. Water Quality Component investment areas and budget for FY2020

Activity	Description	Budget
<b>(existing commitments are shaded)</b>		<b>TOTAL INVESTMENT</b>
		<b>\$23.5m</b>
<p><b>Major new DIN and Pesticide Programs</b></p> <p>Planning and establishment of DIN and pesticide reduction programs in the Herbert, Lower Burdekin, Plane Creek, and Pioneer catchments</p>	<p>These regions will see the largest investment in DIN and pesticide management and therefore programs need to be initiated early in the five-year program. Existing programs (Reef Trust, MIPs) have demonstrated that outcomes can be improved by engaging positively with Traditional Owners and local stakeholders (especially landholders and industry groups), and by undertaking an open and collaborative design process.</p> <p>It is anticipated that such a regionally-focussed design process will take up to six months and provide recommendations on the program scope, delivery mechanisms and governance arrangements. An open and transparent process will be followed to award funding in accordance with these recommendations and Partnership principles. Delivering this package of work in parallel to the FSS programs will be challenging (capacity and ability to engage with a broad range of stakeholders). As a result, planning and implementation phases will be staggered across different catchments. Work in catchments with existing major programs (such as the MIPs) will be part of negotiations to ensure collaboration for effective and aligned delivery.</p> <p>The budget includes some funding for the design and engagement phase, with the majority of funds for initial payments to the implementing organisation/s for on-ground work.</p> <p><i>Deliverables: Program design and implementation strategy reports (catchment specific). Procurement and implementation commenced.</i></p>	\$6.5m
<p><b>Major new FSS Programs</b></p> <p>Planning and establishment of FSS reduction programs in the Fitzroy, Burdekin (Bowen Bogie) and Mary River Catchments</p>	<p>These regions will see the largest investment in FSS management and therefore programs need to be initiated early in the five-year investment plan. As for the DIN and pesticide programs, planning and implementation phases will be staggered across catchments (see Table 3). Work in catchments with existing major programs will be scheduled to align with ongoing work under those programs.</p> <p>The budget includes some funding for the design and engagement phase, with the majority of funds for initial payments to the implementing organisation/s for on-ground work.</p> <p><i>Deliverables: Program design and implementation strategy reports (catchment specific). Procurement commenced.</i></p>	\$4.0m
<p><b>Conservation and protection of less disturbed catchments</b></p> <p>Scoping options and planning</p>	<p>Limited work has been done previously on the options, costs and benefits of interventions aimed at maintaining WQ in less disturbed catchments. An initial consultancy is proposed to determine the priority locations for taking action, the types of actions, and expected outcomes from that work. This will form the basis for preparing a detailed program design for this work stream.</p> <p><i>Deliverables: Consultancy to identify options. Program design completed. Procurement commenced.</i></p>	\$0.5m



Activity	Description	Budget
<b>(existing commitments are shaded)</b>		<b>TOTAL INVESTMENT</b>
		<b>\$23.5m</b>
<b>Innovation and Systems Change</b> Scoping and initial grants related to Innovation and Systems Change	<p>A dedicated innovation program is required to improve cost-effectiveness of actions and ensure enduring outcomes from investments in WQ improvements. Activities under this work stream will be front-loaded to maximise the ability for innovations to be adopted and contribute positively to on-ground actions during the term of the Partnership.</p> <p>This program will focus on four distinct areas:</p> <p><b>Technology transformation.</b> Building on the extensive modelling work of the investment planning phase (2018-2019), a sensitivity analysis will be conducted to identify focus areas where technical innovations would have the largest impact by tackling key limitations and address drivers of cost and effectiveness. Once priorities have been identified, an initial funding round will take place; <i>Deliverables: Report on sensitivity analysis and recommendations for technological innovations. Initial round of grants.</i></p> <p><b>Sharing and management of industry- and landholder-owned data.</b> A review of existing or potential data platforms will be conducted leading to a recommendation on approach(es) that should be piloted as a matter of priority. This will be followed by a competitive grant round to design and run this pilot. <i>Deliverables: Report on review, industry consultation and scoping recommendations. Procurement and initiation of a pilot study.</i></p> <p><b>Broad and local scale planning/mapping of future interventions.</b> A need has been identified for Reef-wide or regional planning/mapping that is not usually addressed by investment targeted at local or sub-catchment WQ improvements. Investing in activities that do not have a single beneficiary but support the entire system can help guide investments by assessing the feasibility and applicability of existing on-ground improvement actions as well as more innovative actions which have not yet been deployed at scale. Planning/mapping needs will be prioritised and an initial grant round will be conducted to service these needs. <i>Deliverables: Planning needs systematically identified and prioritised. Procurement of initial planning projects.</i></p> <p><b>Innovative financing and funding initiatives.</b> Initial focus on opportunity identifying and establishing sub-networks that can collaborate in the development of innovative financing solutions that will enhance the Reef 2050 Plan outcomes. Call for expressions of interest to identify opportunities complementing initial pipeline. <i>Deliverables: Prioritised list of opportunities and pilot programs.</i></p>	\$1.8m
<b>Traditional Owner-led WQ Reef protection initiatives</b> Prioritise, plan and design Traditional Owner-led WQ activities	<p>This work aims to improve Traditional Owner decision-making and participation in on-ground water quality activities as well as to address known information gaps around Traditional Owner values (cultural and other) associated with water sources.</p> <p>Refer to Table 11. This budget figure is also accounted for in the Traditional Owner Reef Protection Component.</p>	\$1.8m
<b>Ongoing WQ activities</b> Continuation of contracted projects under the Stage 1 WQ Grant Round	<p>The delivery of 2018-2019 year investment projects, aimed at maintaining delivery capacity and support implementation of the WQ Component, will continue in financial year 2020. These projects were awarded following an open and competitive process and are expected to be completed by end of June 2020.</p> <p><i>Deliverables: Restoration of gullies, adoption of improved management practices, and maintenance of delivery capacity, as per existing contracts.</i></p>	\$8.9m
	<b>TOTAL INVESTMENT</b>	<b>\$23.5m</b>

Table 3. Water Quality Component Gantt chart for FY2019–2020

Activities	Description	Budget	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		
<b>2018-2019 Investments</b>		\$8.9m														
On-going delivery of existing WQ projects	Ongoing implementation of 11 projects contracted in 2018-2019 financial year. Includes work focussed on practice change and gully remediation.		[Gantt bar spanning July to June]													
<b>Innovation and System Change</b>		\$1.8m														
Technology transformation	Consultancy to identify areas of technological change likely to deliver greatest cost and/or efficacy improvements in WQ activities. Followed by first competitive grant round for proposals to pilot new technologies, including selection process, contracting and inception.		[Gantt bar: Consultancy and design]					[Gantt bar: Call for proposals]		[Gantt bar: Selection]	[Gantt bar: Contracting and inception]					
New data sharing and management platform	Review of existing or potential data platforms and identification of preferred approach to pilot a landholder-owned data management system. Followed by competitive grant round, selection process, contracting and inception of pilot.		[Gantt bar: Review]		[Gantt bar: Concept design]		[Gantt bar: Call for proposals]		[Gantt bar: Selection]	[Gantt bar: Contracting and inception]						
Scoping of planning initiatives	Initial scoping of planning initiatives to support design and implementation of existing and innovative WQ improvement projects.										[Gantt bar: Consultation and scoping]					
Scoping of innovative financing and funding opportunities	Engagement and establishment of networks - Call for expressions of interest - Prioritisation of piloting initiatives.		[Gantt bar: Engagement workshops]					[Gantt bar: Call for EOIs]		[Gantt bar: Prioritisation]						
<b>On-ground actions - DIN and Pesticides</b>		\$6.5m														
Plane Creek and Pioneer	DIN and pesticide focused improvement program. Includes an extensive consultation, engagement and design process to develop program scope, governance, delivery approach and procurement process. Followed by implementation of the recommended procurement and delivery strategy. Staggered implementation across the three catchments.	\$3m	[Gantt bar: Detailed design and engagement process]					[Gantt bar: Procurement and contracting of delivery partners]								
Herbert (DIN only)		\$1m									[Gantt bar: Detailed design and engagement process]					
Lower Burdekin		\$2.5m	[Gantt bar: Detailed design and engagement process]					[Gantt bar: Procurement / contracting]								
<b>On-ground actions - Fine sediments</b>		\$4m														
Fitzroy River	Fine sediment focused improvement program. Includes an extensive consultation, engagement and design process to develop program scope, governance, delivery approach and procurement process. Followed by implementation of the recommended procurement and delivery strategy. Staggered implementation across the three catchments.	\$2m	[Gantt bar: Detailed design and engagement process]					[Gantt bar: Procurement / contracting]								
Mary River		\$1.5m	[Gantt bar: Detailed design and engagement process]					[Gantt bar: Procurement / contracting]								
Bowen Bogie		\$0.5m									[Gantt bar: Design / engagement]					
<b>Conservation and protection of less disturbed catchments</b>		\$0.5m														
Scoping options	Consultancy to identify potential interventions, including priority locations, costs, and benefits.		[Gantt bar: Consultancy and design]					[Gantt bar: Develop program plan]				[Gantt bar: Procurement / contracting]				
Planning and procurement	Develop program plan and commence procurement and contracting.															
<b>Traditional Owner-led WQ Initiatives</b>		\$1.8m														
Governance	Establish governance arrangement for Traditional Owner-led investments.		[Gantt bar]													
Audit	Audit to map current Traditional Owner programs, work, skills and interest.										[Gantt bar]					
Options development	Options paper that identifies implementation pathways for capacity building, culturally appropriate training and leadership programs.										[Gantt bar]					
Cultural values mapping	Mapping how Indigenous knowledge and cultural values of waterways can be shared and considered in design and delivery of programs.		[Gantt bar]													

## WQ Monitoring and Evaluation

Monitoring and evaluation will focus on the end of Partnership outcomes shown in Figure 5. Reductions in end-of-catchment pollutant loads will be primarily assessed using the Paddock to Reef Integrated Monitoring, Modelling and Reporting Program ('Paddock to Reef'). Programs and projects under the WQ Component will be required to report to Paddock to Reef. Target load reductions for DIN and FSS related to the regionally focussed on-ground actions are shown in Figure 6 and Figure 7 and are described in detail in the Partnership Final Monitoring and Evaluation Plan. Specific targets for reductions in pesticide loads will be set at a later stage, once additional information on the cost effectiveness of pesticide-related interventions is gathered.

In addition, the Component will track progress along the pathways to pollutant reductions, by measuring the extent of interventions undertaken

(such as number of hectares of improved land management practice, or area of gully or streambank restoration completed) and, where feasible, through monitoring the local WQ outcomes resulting from those interventions. Specific targets for particular interventions (such as the extent of practice change or catchment restoration for a specific location) will be determined as part of the detailed design phase for different catchment-level programs.

Progress in the Innovation and System Change work stream will be measured by assessing the potential benefit and suitability of new approaches, systems and tools, as well as the extent to which they have been supported or adopted through ongoing programs.

More details on the WQ Component program logic and monitoring and evaluation are available in the Final Monitoring and Evaluation Plan.








### 3. Crown-of-Thorns Starfish (COTS) Control Component – Annual Work Plan

**Budget:** \$57.8 million

**Purpose:** The purpose of this Component is to expand efforts to control crown-of-thorns starfish (COTS) to reduce coral mortality from COTS outbreaks in order to protect high ecological and economic value coral reefs in line with GBRMPA's COTS Control Strategy.

**Priorities under the Partnership Investment Strategy:**

	Support existing in-water COTS control and drive towards improved efficiency
	Lead a step change in surveillance for early COTS detection and early intervention
	Explore alternative control methods to address COTS management at a broad scale in the future

Nevertheless, containing primary outbreaks before they can spread, and should this fail, strategically focusing the control effort to minimise the spread and impact of secondary outbreaks, is more likely to increase management effectiveness than manual in-water control of secondary outbreaks alone.

The COTS Control Component focuses on efforts to control COTS with the goal to expand and improve COTS management to reduce coral mortality from secondary outbreaks at high ecological and economic value coral reefs in the short-term with a view to achieving better prevention and/or suppression and containment of primary outbreaks in the near- to medium-term (Figure 9).

#### Overview

The Pacific crown-of-thorns starfish (COTS; *Acanthaster cf. solaris*) is a coral eating starfish that is native to the Reef. A single adult starfish can consume approximately 10m<sup>2</sup> of coral per year and, under normal conditions, the level of coral predation by COTS can be sustained with no apparent long-term reef degradation. However, when COTS population numbers increase out of the normal range, they can reach densities where they eat coral tissue at a rate faster than the coral can grow. This population increase is known as a COTS outbreak, with the Reef currently experiencing its fourth major recorded outbreak.

Future COTS outbreaks are almost certain and reducing the incidence or severity of these outbreaks will continue to be a critical management priority to reverse widespread and sustained declines in coral cover, particularly given the cumulative impacts from other threats, such as coral bleaching, tropical cyclones and decreased water quality.

To date the management of COTS on the Reef has been solely focused on dealing with secondary outbreaks, essentially because primary outbreaks could either not be detected or addressed in time. The control approach relies on surveillance to detect outbreaks and on divers to manually cull individual adult starfish, and there is evidence that this can be effective in protecting coral cover at key targeted sites.

#### COTS outbreaks on the Reef

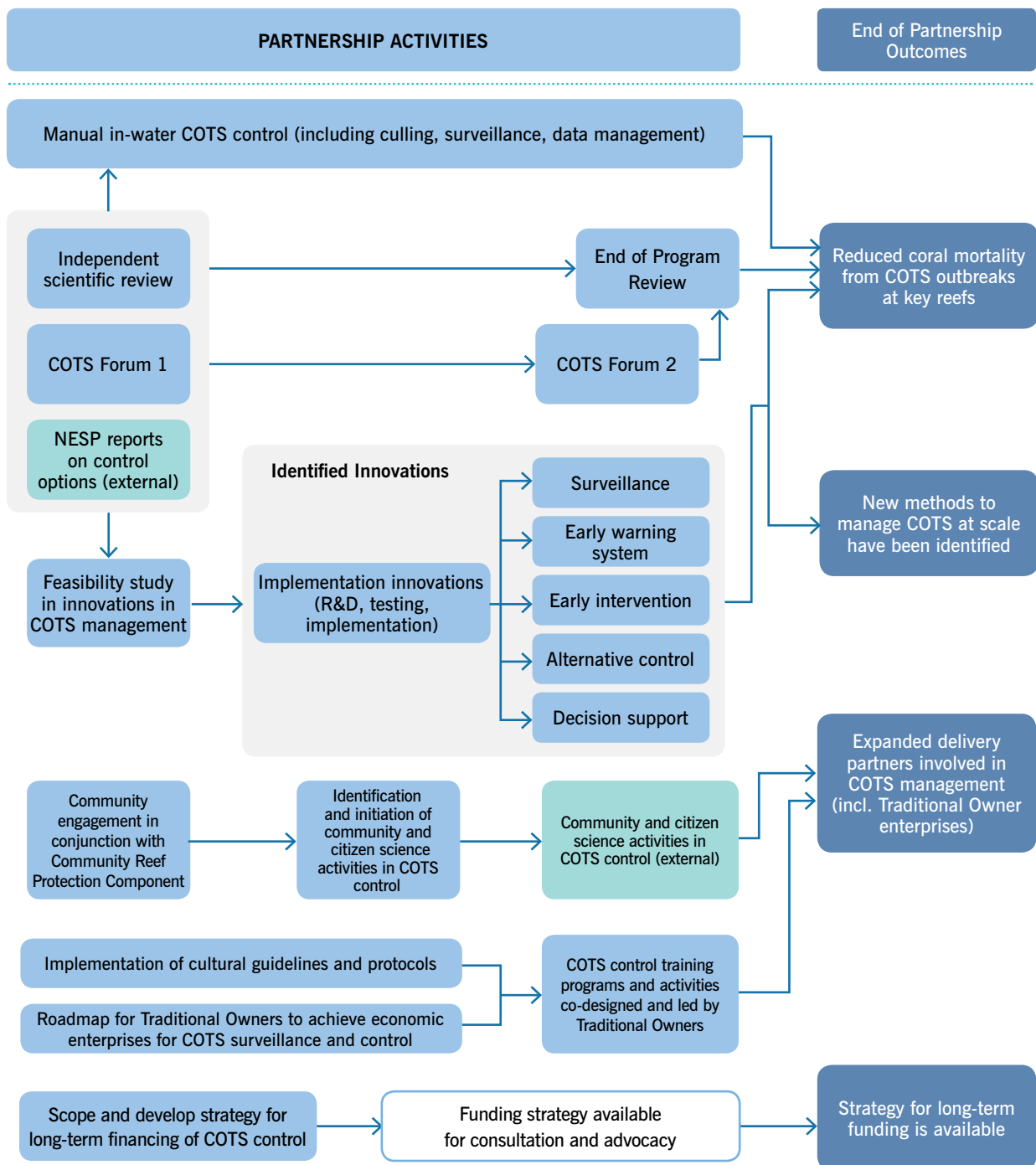
Four major COTS outbreaks have been recorded (1962, 1978, 1993, 2010) and shown to originate from reefs in the northern and central Great Barrier Reef (14°S to 21°S).

Outbreaks in this region start from the build-up of dense COTS numbers on reefs between Cairns to Cooktown, and are termed primary outbreaks. The formation of primary outbreaks takes several years for numbers to build up from a low base and match the availability of food.

The next phase is more rapid and involves the export of massive numbers of larvae from spawning populations on reefs with primary outbreaks to reefs located downstream. The larvae can settle and establish into an outbreak in a single generation, which are termed secondary outbreaks.

Once initiated from primary outbreaks, secondary outbreaks continue to spawn and establish and flow to the southern limits of the central Reef by larval transport on the dominant shelf currents.

Figure 9. COTS Component five-year program overview and end of Partnership outcomes



As the Reef is still in the midst of a secondary outbreak, it is important in the short-term to maintain efforts to protect coral cover at high ecological and economic value reefs using manual in-water control, the only practical method currently available for COTS management. There is also a need to continue investing in surveillance, data collection and management, and in optimising the prioritisation of COTS control sites. These activities can leverage ecological research and modelling delivered under the RRAS Component and outside the Partnership.

However, recognising that the current manual control method cannot address the threat posed by COTS at the scale of the Reef, there is an urgent need to identify new ways to protect coral cover at much larger scales. The Partnership will therefore seek to address knowledge gaps and investigate options to not only improve the current control method, but ultimately achieve a step change in the scale at which COTS can be controlled.

As a foundational activity early in financial year 2019-2020, an independent scientific review will provide a scientific assessment of the effectiveness of the COTS control program. With a detailed focus on the recently expanded program, which has been operational since July 2018, the review will assess the protection of coral cover at managed versus unmanaged reefs. It will also identify the nature and frequency of monitoring data required to support a continuous and statistically robust evaluation of the effectiveness of the control program over the term of the Partnership, underpinning an adaptive management process, including assessing the balance of investment between manual in-water control and investigation into new approaches.

Based on the current state of science, there is no obvious preferred candidate technology or approach, ready for investment, that could lead to a step change in the scale and effectiveness of COTS control. Bringing together traditional and new experts from a broad range of disciplines and sectors in pursuit of a common goal is essential if radically new solutions are to be identified, developed and demonstrated at scale. This is a priority for the Partnership which will, in financial year 2019-2020, support and coordinate a strategic COTS forum and set up a highly targeted collaborative initiative (consortium) tasked with delivering a feasibility study into new COTS control and surveillance options.

Open to a broad range of participants, this consortium will consider all existing ideas and subject these to a rigorous and consistent scientific assessment and decision-making process, thereby enabling the identification of approaches that warrant further investigation and strong investment support to accelerate a transition from research to implementation. More than a planning exercise, this feasibility study will include concrete investigations to support prioritising alternative control methods as well as initiatives to improve the current control program.

Recommendations from the feasibility study will form the basis of a longer-term innovation program, implementing strategic R&D activities and adoption pathways to ensure promising alternative approaches to COTS management can be trialled at relevant scales and integrated effectively in future COTS management efforts. This program will be designed to build on, leverage and align with existing initiatives involving COTS research (e.g. NESP and research institutions).

Mitigation of predation from COTS will remain one of the strongest levers to protect coral cover in coming decades. Future COTS outbreaks are almost certain and taking a long-term view of the funding and delivery of COTS management is imperative. The Partnership will investigate models for sustained funding to facilitate future planning. In addition, the role of community and citizen science to engage more widely in COTS control will be explored, in conjunction with the Partnership's commitment to invest 10% of the total COTS Control Component budget to activities led by and co-designed with Traditional Owners.

### Process to develop the Annual Work Plan

The development of both the Investment Strategy and the Annual Work Plan are consistent with the Reef 2050 Plan, the GBRMPA COTS Management Strategy, and the National Environmental Science Programme Integrated Pest Management Strategy for COTS. A COTS Working Group has been established to support the planning and development of this Annual Work Plan (refer Appendix 2), which includes representatives from GBRMPA and research institutions. In addition, the Partnership has consulted closely with the GBRMPA and the National Environmental Science Program (NESP) on COTS control operations and science.

The quantum of funding targeted to innovation is based on direct input from the COTS Working Group, whose members recommended that between 10% and 20% of the total funding allocation be directed towards research and innovation into improved COTS surveillance and control methods as well as new control methods. The current allocation to innovation (\$9.8 million) represents approximately 17% of the total funding available for this Component.

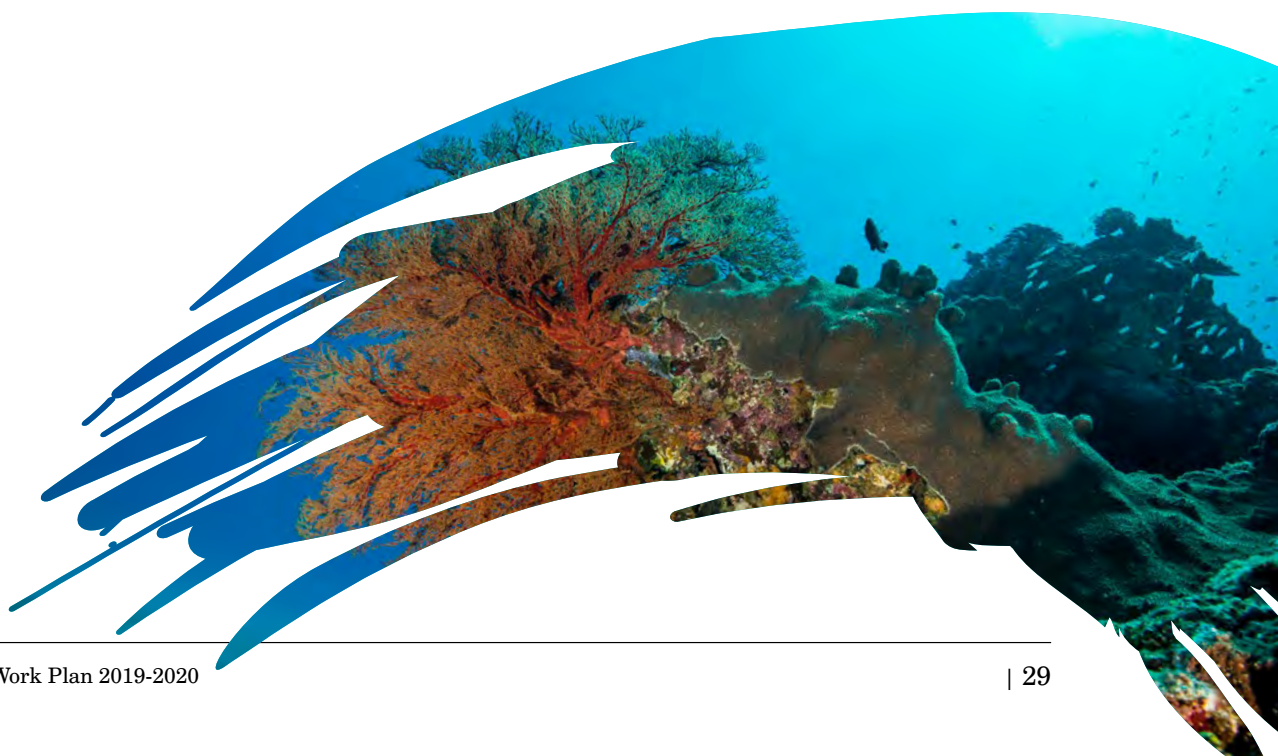


## Five-year plan

Table 4. COTS Control Component five-year investment areas and budget

Partnership Activity	Rationale	Outcome	Budget
<b>TOTAL INVESTMENT</b>			<b>\$57.8m</b>
<ul style="list-style-type: none"> <li>Manual in-water COTS control to be maintained at a level consistent with scientific advice and intensity of the current outbreak</li> </ul>	<p>Until such time as new large scale control methods become available, manual in-water control of COTS remains the only practical option available to Reef managers to reduce COTS densities and protect coral cover at high ecological and economic value sites.</p>	<p>Reduced COTS mortality from current COTS outbreaks at high ecological and economic value coral reefs.</p>	\$41.5m
<ul style="list-style-type: none"> <li>Collaborative feasibility study to assess opportunities for innovations in COTS management</li> </ul>	<p>There has been limited funding for activities focusing on innovations in COTS control and these activities have been disjointed. Recent NESP investments, through the Reef &amp; Rainforest Research Centre (RRRC), have led to significant progress in this area with the development of an integrated pest management strategy.</p> <p>Targeted investment is needed for a collaborative feasibility study involving key scientific agencies to systematically investigate the potential of new COTS control options, and to prioritise future investment in R&amp;D and enabling social and regulatory areas.</p>	<p>Recommendations on priority innovation areas in COTS management with the goal of an enhanced ability to predict and detect primary outbreaks and more effectively control the spread and impact of these outbreaks.</p>	\$1.5m
<ul style="list-style-type: none"> <li>Implementation of feasibility study recommendations into innovations in COTS management</li> </ul>	<p>Future outbreaks on the Reef are almost certain and the immediate need to control secondary outbreaks using manual in-water control needs to be balanced with the identification and suppression of future primary outbreaks and innovative methods and technologies that can complement existing manual in-water control.</p> <p>Targeted investment in transformational innovations, based on outcomes of the feasibility study, can provide a pathway towards a step change in COTS control.</p>	<p>R&amp;D, testing and implementation of new methods including in early warning systems, early intervention options, alternative control technologies, and improved prediction and decision-making.</p> <p>Innovative methods and technologies that can complement existing manual in-water control are ready for implementation.</p>	\$8.3m
<ul style="list-style-type: none"> <li>Independent scientific reviews of COTS control program effectiveness</li> </ul>	<p>The need for an independent review of COTS control was highlighted during Partnership consultations (including with the Reef 2050 Independent Expert Panel).</p> <p>The COTS control program is continuously evolving, and its effectiveness will benefit from regular independent reviews (2020 and 2024).</p>	<p>Recommendations for improvements to monitoring and control activities, and to facilitate future planning and investments in COTS control.</p>	\$0.25m

Partnership Activity	Rationale	Outcome	Budget
<ul style="list-style-type: none"> <li>● COTS forums to</li> <li>● identify gaps and</li> <li>● opportunities in</li> <li>● innovation and</li> <li>● contribute to</li> <li>● Partnership progress</li> </ul>	<p>There is a recognised need by stakeholders for regular forums dedicated to COTS research and management in 2020 and 2024, focused on identifying innovation priorities and to address the long-term challenge of COTS control.</p>	<p>Enabling cross-sector dialogue and supporting long-term planning of innovation in COTS management.</p>	\$0.20m
<ul style="list-style-type: none"> <li>● Long-term funding</li> <li>● strategy for COTS</li> <li>● control</li> </ul>	<p>Effective action on COTS predation will be one of the strongest levers to protect coral cover in the coming decades, therefore a long-term approach to sustained funding is imperative.</p>	<p>A funding strategy that presents a comprehensive business case and real options to support planning and policy development for long-term funding of COTS management.</p>	\$0.15m
<ul style="list-style-type: none"> <li>● Community driven</li> <li>● activities for expanded</li> <li>● involvement in COTS</li> <li>● control</li> </ul>	<p>Through stakeholder consultation and the Community Reef Protection Component, the role of community and citizen science to engage more widely in COTS control has been identified as an opportunity to expand partner delivery capacity.</p>	<p>Identification of opportunities to support community and citizen science participation in COTS control and implementation of pilot community programs.</p>	\$0.10m
<ul style="list-style-type: none"> <li>● Traditional Owner</li> <li>● activities (to be</li> <li>● defined under</li> <li>● Traditional Owner</li> <li>● Reef Protection</li> <li>● Component)</li> </ul>	<p>There is a need to promote positive engagement to protect and maintain culture and heritage values and to support the transition into sunrise industries for increased business enterprise opportunities, alongside the diversification of skillsets and capacity building.</p> <p>Refer to Table 10. This budget figure is also accounted for in the Traditional Owner Reef Protection Component.</p>	<p>Scoping of business ready Traditional Owner groups to transition to manual in-water control activities.</p> <p>Identification and delivery of training to upskill Traditional Owners and funding of viable groups directly to enable contributions to manual in-water control activities.</p>	\$5.8m
<b>TOTAL INVESTMENT</b>			<b>\$57.8m</b>



## Financial year 2019-2020 work plan

Table 5. COTS Control Component investment areas and budget for FY2020

Activity	Description	Budget
(existing commitments are shaded)		<b>TOTAL INVESTMENT</b>
		<b>\$4.33m</b>
<p><b>Manual in-water COTS control</b></p> <p>Maintain at a level consistent with the FY2019 in-water control activity</p>	<p>The Partnership will provide short-term funding to GBRMPA to ensure continuity of the manual in-water COTS control program in FY2020, at a level consistent with FY2019, focused on protecting coral cover at key reefs prioritised by GBRMPA and based on targeted manual culling of COTS to below ecological thresholds.</p> <p>GBRMPA has been identified as the logical delivery partner as they have contracts in place with providers which were selected via a rigorous and competitive procurement process. In addition, GBRMPA have operational systems already in place including a dedicated management team, databases, portals and a prioritisation system.</p> <p>GBRMPA's current funding allocation enables it to carry out manual in-water control for part of FY2020. The Partnership will cover the shortfall to maintain the control program and engagement with providers for FY2020. The funding allocation is based on direct advice from GBRMPA, reflecting current contracting rates with providers and projected management costs.</p> <p>COTS activities currently funded under NESP will continue to provide strategic advice to GBRMPA for improved decision support and effectiveness of manual in-water control, including improving the strategy underpinning the current COTS control program to achieve ecologically meaningful outcomes for hard coral cover at regional scales.</p> <p>This approach and operational requirements for subsequent years will be reviewed based on the findings of the independent review on effectiveness of the control program.</p>	\$2m
<p><b>Independent scientific review</b></p> <p>Independent review of COTS control program effectiveness</p>	<p>The need for an independent review of the effectiveness of the current COTS control program was highlighted during Partnership consultations. The COTS control program is continuously evolving, and its effectiveness will benefit from regular independent reviews, with the first review to take place in financial year 2019-2020. The review will specifically deliver recommendations on the monitoring information required to assess with confidence the effectiveness of the control program, now and in the future. This will cover both the type of monitoring needed, as well as its spatial and temporal distribution.</p>	\$0.1m
<p><b>COTS Forum</b></p> <p>Identify gaps and opportunities to feed into the innovation feasibility study</p>	<p>A two-day forum (in November 2019) will bring together partners currently involved in COTS control, along with experts from overseas and related disciplines to identify gaps and opportunities and inform the innovation feasibility study. The Forum will stimulate cross-sector dialogue and is inspired by the approach followed at the Great Barrier Reef Restoration Symposium, organised in Cairns in July 2018 by the RRRC, which received positive feedback. The Forum will also provide a networking opportunity for Australian and international experts to discuss innovations in COTS management and foster collaborations.</p>	\$0.1m
<p><b>Long-term funding strategy</b></p> <p>Scope and develop a strategy to identify long-term funding options for COTS control</p>	<p>Sustained funding of COTS control is imperative if future outbreaks are to be detected and acted upon as early as possible. Even though we are still dealing with an existing secondary outbreak, there is a need to proactively consider long-term funding model options to ensure we are ready to tackle new outbreaks and avoid repeating mistakes of the past. A consultancy will be procured this financial year to engage with key stakeholders, review potential funding models and provide recommendations (roadmap). This will form the basis of further engagement between providers and funders and facilitate future planning and policy decisions for long-term stable investments in COTS control.</p>	\$0.1m



Activity	Description	Budget
<p><b>Innovation feasibility study</b></p> <p>Collaborative investigation of the feasibility (technical, regulatory, social) of innovations in COTS management and development of an investment case for a dedicated R&amp;D program to deliver these innovations</p>	<p>A dedicated innovation program is required to improve and expand COTS management beyond manual in-water control, if we are to address this issue and protect coral cover at the scale of the Reef. While a number of potential solutions have been researched and published, these are still a long way from being investment ready from a technical, social licence and regulatory point of view.</p> <p>In a manner not dissimilar to the Reef Restoration and Adaptation Program Concept Feasibility Study, albeit at a smaller scale, a consortium will be established to systematically review and assess innovative COTS surveillance and control options and to identify pathways to implementing the most promising options. This study will bring together the best minds in science and technology from leading research institutions (including but not restricted to existing participants), together with managers and policy makers and leverage efforts in Australia (and internationally) to identify and review new approaches. It will assess risk, social licence and regulatory issues and ultimately recommend a roadmap, R&amp;D and investment program to demonstrate and make these innovations a reality.</p> <p>It is anticipated that this study would consider innovations across a range of COTS management areas such as early warning systems, early intervention, alternative control options, predictive modelling of outbreaks and decision-support (in conjunction with the Reef Restoration and Adaptation Science Component). The multi-institutional collaboration will create a shared vision and understanding to support and contribute to the long-term Partnership COTS control activities.</p>	<p>\$1.5m</p>
<p><b>Community activities</b></p> <p>Scope community and citizen science opportunities for expanded delivery in COTS control</p>	<p>A consultation and planning process with the Community Reef Protection Component Working Group will identify areas of strategic alignment with community and citizen science needs, and in particular opportunities for community participation in COTS surveillance and control. This will result in a strategy to enable these opportunities and further engagement and co-investment across the duration of the Partnership.</p>	<p>\$0.03m</p>
<p><b>Traditional Owner activities</b></p> <p>Scope Traditional Owner opportunities for expanded delivery in COTS control</p>	<p>This Component will support activities that aim to improve Traditional Owner decision-making and participation in COTS control activities. The Partnership will fund viable Traditional Owner groups' contributions to in-water COTS control activities and, where required, fund established or new training and service delivery partnerships.</p> <p>Refer to Table 11. This budget figure is also accounted for in the Traditional Owner Reef Protection Component.</p>	<p>\$0.5m</p>
<b>TOTAL INVESTMENT</b>		<p><b>\$4.33m</b></p>

Table 6. COTS Control Component Gantt chart for FY2019–2020

Activities	Description	Budget	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
<b>Manual in-water COTS control</b>			\$2.0m												
Due diligence and establishment of outsourcing contract	GBRMPA is in a position to run the current fleet of COTS control vessels for a major portion of FY2020. Following a due diligence of GBRMPA's control program systems, a contract will be established for GBRMPA to receive funding from the Partnership and maintain the current level of control. An end of year progress report and a review of future vessel needs will feed into a longer-term delivery strategy.		Due diligence and contracting												
Delivery of COTS control program						Program delivery (GBRMPA)									
Scoping of long-term program delivery and procurement											Review		Procurement		
<b>Independent scientific review</b>			\$0.1m												
Independent review	Review of effectiveness of the current in-water control program and recommendations on monitoring and data collection needs.		Independent review												
<b>Innovation feasibility study</b>			\$1.5m												
Program design	Following a model similar to the Reef Restoration and Adaptation Program, partners will be sought to form an unincorporated joint venture, with agreed objectives and clear governance arrangements. A program schedule will be developed and contracts established. The study will lead to technical reports and recommendations on methods/technologies that offer the most prospect and for which further investigations should be prioritised.		Program design												
Governance and establishment			Collaboration governance and contracting												
Program delivery						Program delivery									
Report and recommendations														Recommendations	
<b>COTS Forum</b>			\$0.1m												
Program design	Design and delivery of a dedicated COTS forum bringing together partners currently involved in COTS control, along with experts from overseas and related disciplines. Forum proceedings summary to feed into innovation feasibility study.		Program design												
Communication and delivery				Communication and registration			Forum								
<b>Long-term funding strategy</b>			\$0.1m												
Scoping and procurement	Terms of reference will be developed for a consultancy to review funding model options, engage with key stakeholders and provide recommendations (roadmap). These recommendations will form basis of further engagement between providers and funders.			Scoping	Procurement										
Delivery and engagement								Delivery							
Review and recommendations													Recommendations		
<b>Community activities</b>			\$0.03m												
Scoping with Community Reef Protection Component Working Group	The Community Reef Protection Component Working Group will identify opportunities and strategic alignment with community and citizen science needs to identify a preferred strategy to engage with and identify opportunities for community and citizen science involvement in reef management through participation in COTS control.			Working group					Working group						
Engagement activities and recommendations						Engagement							Recommendations		
<b>Traditional Owner activities</b>			\$0.5m												
Governance	Establish governance arrangement for Traditional Owner-led investments and develop cultural guidelines.		Governance												
Audit	Audit to map current Traditional Owner programs, work, skills and interest.			Audit											
Options development	Mapping opportunity pathways to transition from participation to Traditional Owner-led programs through a co-design process.					Options development									



## COTS Monitoring and Evaluation

The Final Monitoring and Evaluation Plan outlines the COTS Control Component-level logic which maps how the work undertaken in the COTS Control Component is expected to bring about desired change against the end of Partnership outcomes shown in Figure 9.

Overall, the key success factor of the COTS Control Component will be evidence of reduced coral mortality from COTS at key reefs that have been prioritised for management. Following recommendations from the Integrated Pest Management Strategy, quantitative data from the control program and GBRMPA will be used to assess: i) the number and area of priority reefs where COTS densities are maintained below the threshold at which coral cover is lost to COTS (ecological threshold); and ii) whether there has been a reduction in the average size of COTS at priority reefs.

In addition, evidence of progress in innovations in COTS management will be tracked to identify what methods and technologies have been trialled and/or implemented and how they have contributed to improved decision-making and the ability to predict and identify the next primary outbreak. The effectiveness of Traditional Owner- and community-led COTS control activities will also be tracked and documented to assess the impact of the Partnership to lead a step change in expanded partner delivery in COTS management.

More details on the COTS Control Component program logic and monitoring and evaluation are available in the Final Monitoring and Evaluation Plan.

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*The key success factor of the COTS Control Component will be evidence of reduced coral mortality from COTS at key reefs that have been prioritised for management.*

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## 4. Reef Restoration and Adaptation Science (RRAS) Component Component – Annual Work Plan

**Budget:** \$100 million

**Purpose:** The purpose of this component is to conduct and implement science activities to deliver and support reef restoration and adaptation for the Great Barrier Reef World Heritage Area.

### Priorities under the Partnership Investment Strategy:

<span style="color: blue;">●</span>	Social licence to operate
<span style="color: yellow;">●</span>	The right science and models underpinning the right decisions
<span style="color: teal;">●</span>	Research and development to boost new intervention methods
<span style="color: purple;">●</span>	Making interventions a reality on the Reef

### Overview

While strong action on reducing greenhouse gas emissions is critical, the world is locked into a trajectory of global warming for at least the next 30 years. This means that there is an urgent need to explore and develop techniques and strategies to limit coral loss, support coral recovery and restore coral cover. Indeed, scientists, engineers and reef managers around the world are turning their minds to exploring new intervention approaches as the urgency for action becomes more and more obvious. Our window for action is now, while there is still enough diversity to preserve and restore. “Waiting it out” is not an option.

Even though existing technologies may prove effective at small scales, they remain labour intensive and expensive. Using current best practice, it has been estimated it would take over 700,000 divers, working around the clock, at a cost of trillions of dollars to simply match the present rate of loss of coral reefs worldwide.

Australia and the Great Barrier Reef are at the forefront of reef management and research. Over the past 18 months, Australia’s leading marine science institutions, together with numerous national and international experts, have come together to explore the feasibility of coral reef restoration and adaptation at large scales, for the purpose of maintaining and restoring the ecological function of coral reefs. This work plan reflects the recommendations of this feasibility study.

### Process to develop the Annual Work Plan

As per the Grant Agreement, the work undertaken as part of the RRAS component has built upon the recommendations from the Reef Restoration and Adaptation Program (RRAP) concept feasibility study, which was delivered by a consortium of seven core partner organisations (AIMS, CSIRO, JCU, UQ, QUT, GBRMPA and GBRF) and associated key experts from Australia and internationally. The objectives of the RRAP concept feasibility program were to:

- Conduct a preliminary evaluation of the widest possible range of intervention techniques, alone and in combination, that could be used to protect the Reef’s ecological functions and economic and social values;
- Recommend a comprehensive research and development (R&D) program to develop and test the underlying knowledge needed to successfully intervene on the Reef, at scale; and
- Develop a business case for investment in the R&D required to move from concept to actual on-reef intervention.

The work was led by AIMS with oversight by a Steering Committee and Executive Committee. Both committees had representatives from all seven core RRAP partners. The final investment case and recommendations from the RRAP concept feasibility study will be submitted to the Australian Government. All aspects of the feasibility study will be peer-reviewed, to ensure the process adopted and the options identified are reasonable in the context of the current scientific, social and community understanding of the challenge.

The preliminary conclusions of this study are that, with the proper research and development effort, there is a reasonable prospect that we can help the Reef recover from, and adapt to, the effects of climate change.



The degree of success achieved will depend on a wide range of factors, including: appropriate funding, stakeholder and Traditional Owner support, regulatory capacity building, collaboration of key agencies and research providers, inclusion of private sector capability in the effort, and, ultimately global action on climate change. In addition to the RRAP feasibility study, investments made by other organisations, including the Queensland Government's Boosting Coral abundance on the Great Barrier Reef Challenge, have generated valuable data to this field of investigation.

The budget proposed within this work plan was constructed as a pro rata version of the total and year-one budget recommended by RRAP, reflecting the proportion of available funding through the Partnership as a function of the total presented in the RRAP investment case. It assumes a total investment of \$90m, including 2018-2019 year investments and reflecting the 10% investment to Traditional Owner-led activities. This represents 27.5% of the budget recommended by RRAP. However, it is envisaged that once the governance structure is established, the distribution of this budget will be revised to better reflect likely co-investment areas, Partnership Grant Agreement conditions (for example in terms of proportion of administrative expenditure) and relative urgencies and interdependencies of proposed activities.

## Five-year plan

The RRAS Component builds on the outcomes of the RRAP concept feasibility program. Under the Partnership, the RRAS component has a long-term vision whereby coral restoration and adaptation techniques are being actively used in resilience-based management of the Reef and a new marine restoration industry is enabled.

To progress towards this, the end of Partnership outcomes (Figure 10) are:

- A toolbox of scientifically-proven, ecologically effective, socially acceptable, technically feasible, and economically viable restoration and adaptation techniques ready for investment in implementation, at a range of scales; and
- Australia is recognised internationally as leading coral reef restoration science.

The program will consider the widest possible range of intervention options, ranging from cooling and shading to reduce coral stress during acute events, to enhancing coral reproduction and recruitment to help restore coral reef health and resilience on recovering reefs, helping corals adapt better to warming conditions. Deployment methods that will be considered depend on the type and scale of intervention, and include divers, vessels and barges of different sizes, moored platforms, and automated systems.

Several areas of the RRAS component have clear synergies and linkages across the Partnership, at both program and component levels. Innovation is at the heart of much of the proposed work within this Component. Moving new and existing restoration technologies towards large scale implementation will require step change and a significant investment in automation and technology transformation. Achieving this will involve new partnerships and embracing new ways of thinking and doing. This is neither a research only nor an industry only endeavour; this is a program that relies on strong partnerships between sectors.

Traditional Owners and stakeholders will be materially engaged in decisions on where and how to intervene in reef restoration and adaptation. Traditional Owners will be further engaged through establishing a Traditional Owner advisory committee as part of the governance framework as well as through tailored up-skilling to enable active engagement with R&D and technical implementation. This is expected to result in broader social agreement on the benefits and risks of restoration activities and how they will be managed, which along with a robust regulatory framework, is a precursor to ensuring that governance and decisions are legitimised.

The stakeholder engagement activity has been co-designed with the Community Reef Protection Component to ensure maximum synergies and benefits for both areas. Many engagement activities under the Community Reef Protection Component will reflect restoration or monitoring actions, designed to benefit ongoing R&D and monitoring efforts within the RRAS and Integrated Monitoring and Reporting (IMR) Components. The connection to the IMR Component is evident through the extension of the decision support system, which will be developed specifically to ensure it forms a part of a larger management decision support system that also considers management actions relating to water quality, COTS control and conventional conservation and protection.

Figure 10. RRAS Component five-year program overview and end of Partnership outcomes

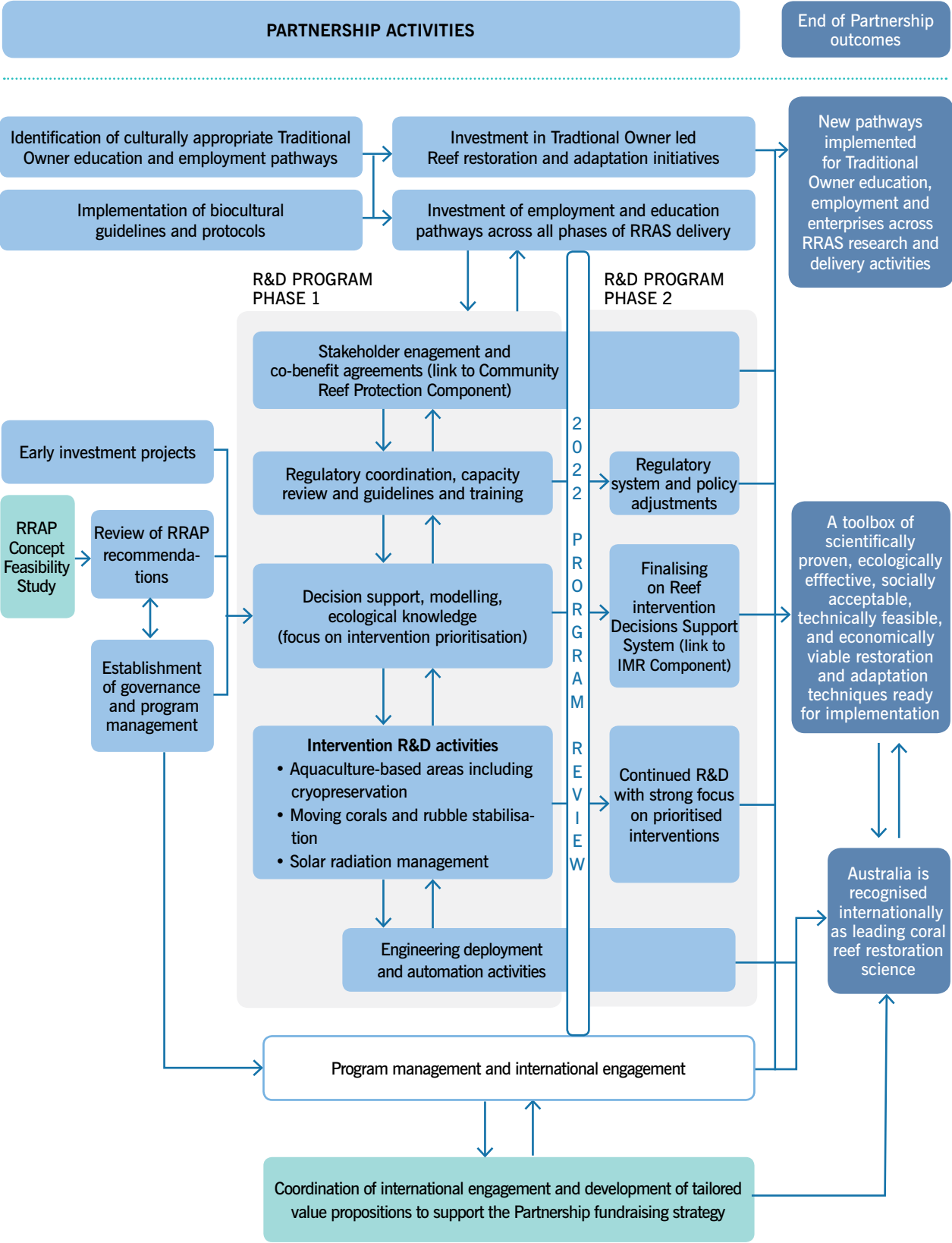


Table 7. RRAS Component five-year investment areas and budget<sup>3</sup>

Partnership Activity	Why?	Outcome	Budget <sup>3</sup>
<b>TOTAL INVESTMENT (as recommended by RRAP)</b>			<b>\$326.6m</b>
<b>TOTAL PARTNERSHIP INVESTMENT</b>			<b>\$97.8m<sup>4</sup></b>
● Traditional Owner and stakeholder engagement: The program will adopt scientifically supported engagement processes. This activity will see additional co-investment through coordination with the Community Reef Protection Component.	Social consensus is the basis of social licence to operate. A driver of perceived benefit and risk and by extension, it impacts permitting and regulatory systems. It is essential to match the chosen strategy to program needs/purpose and community/ stakeholder expectations.	Social licence to operate. A more engaged and actively participating Reef community.	\$5.7m (\$1.6m)
● Regulatory activities: Develop a robust and enabling regulatory environment for reef restoration and adaptation and regulatory system capacity to assess risks and impacts.	Interventions within the Great Barrier Reef World Heritage Area may involve a range of state, federal and international regulatory requirements depending on location and nature of the intervention.	A more fit for purpose regulatory and policy environment for restoration and adaptation interventions and research.	\$2.8m (\$0.7m)
● Modelling and decision support systems: Applying next generation reef models to underpin feasibility testing and investment decisions, including activities dedicated to conducting ecological process studies to fill knowledge gaps regarding drivers of stress and adaptation.	Defensible decision-making requires integrating information from multiple sub-projects (and disciplines) using a common structure and language.	Robust integrated models underpinning the prioritisation of investments in intervention and deployment strategies, based on the best possible ecosystem process data.	\$33.6m (\$9.0m)
● Aquaculture based program areas including cryopreservation: R&D focusing on propagation optimisation, brood stock creation, improving methods for deployment and treatments to support resilience, fitness and survival of coral.	At present, there are no restoration or adaptation techniques that work, or are cost effective at the scale required to ensure survival of coral reefs. This activity will be the world's largest effort to overcome this challenge.	A suite of intervention techniques that can feasibly protect or restore coral reefs.	\$103m (\$27.6m)
● Moving corals and rubble stabilisation: A field-based effort to transfer brood stock and larvae. It will include efforts to improve recruitment on to reefs following disturbances (rubble stabilisation/algae removal).	As the Reef remains diverse and reproductively healthy, there is scope to improve methods that capture this diversity. Improving settlement and post-settlement survival in the wild will also benefit the out-planting component of the aquaculture-based programs.	Methods to increase natural recruitment, or to facilitate mass migration will be made available to restore degraded reefs.	\$44.3m (\$11.8m)

3 The budget in this table reflects the total budget from the RRAP concept feasibility study. Total Partnership investment is provided in brackets. Additional funding will include research provider co-investment, funds raised through the GBRF capital campaign and other leveraging initiatives.  
 4 \$2.225 million were committed to investment projects in financial year 2018-2019



Partnership Activity	Why?	Outcome	Budget <sup>3</sup>
<p>● Solar radiation management: A strong initial investment to investigate the feasibility of this will direct any further investments, which will likely require substantial additional investments outside the scope of the Partnership.</p>	<p>Preliminary modelling indicates that the best option for Reef-wide protection lies in large scale solar radiation management. The feasibility of this approach will depend on correlations between solar radiation and heat impacts of non-lethal bleaching in the adaptation process and detection of unintended ecosystem impacts.</p>	<p>A possible large-scale intervention method focused on prevention of loss during coral bleaching conditions.</p>	<p>\$62.3m (\$16.6m)</p>
<p>● Systems engineering and integrated logistics: This sub-activity will focus on identifying and utilising synergies between engineering needs of the R&amp;D components.</p>	<p>To ensure cost-benefits and to progress multi-intervention deployment engineering challenges.</p>	<p>Interventions are assessed against deployment logistics and cost savings are made through coordination of activities.</p>	<p>\$14.9m (\$4.1m)</p>
<p>● Automation: Activities to develop automation and mass production technologies to overcome the cost and scale challenges in delivering intervention technology.</p>	<p>Delivering any interventions at the scales required to have an impact at large scales will require automation, robotics and autonomous systems to be developed.</p>	<p>Intervention production and deployment processes to be done at required scales and within reasonable budgets.</p>	<p>\$9.8m (\$2.6m)</p>
<p>Program management and logistics: Program coordination and management, including international engagement activities and early phase assessments of emerging technology and interventions.</p>	<p>Program coordination is crucial for the success of a program of this size.</p>	<p>Program delivers outcomes in timely and cost-efficient manner.</p>	<p>\$50.2m (\$13.8m)</p>
<p>Traditional Owner-led Reef protection initiatives (to be defined with Traditional Owner Reef Protection Component).</p>	<p>There is a need to promote positive engagement to protect and maintain culture and heritage values and to support the transition into sunrise industries for increased business enterprise opportunities, alongside the diversification of skillsets and capacity building. Refer to Table 10. This budget figure is also accounted for in the Traditional Owner Reef Protection Component.</p>	<p>Scoping of readiness and upskilling opportunities for Traditional Owner groups to transition to reef restoration activities.</p>	<p>(\$10m)</p>
<b>TOTAL INVESTMENT (as recommended by RRAP)</b>			<b>\$326.6m</b>
<b>TOTAL INVESTMENT</b>			<b>\$97.8m<sup>4</sup></b>

## Financial year 2019-2020 work plan

Table 8. RRAS Component investment areas and budget for FY2020

Activity	Description	Budget
<b>TOTAL INVESTMENT (as recommended by RRAP)</b>		<b>\$34.4m</b>
<b>TOTAL PARTNERSHIP INVESTMENT</b>		<b>\$10.0m</b>
Establish program governance	<p>Establishing a program board, appointing a program director and core management team as well as incorporating and operationalising the monitoring and evaluation plan is a critical first step. Budget for this activity covers program management costs for the first year of operation.</p> <p><i>Deliverables: Program governance is established, and program management team is operational.</i></p>	\$1.5m
Traditional Owner and stakeholder engagement	<p>This activity will start early to capitalise on the momentum of the RRAP concept feasibility phase and ensure Traditional Owners and stakeholders remain engaged and informed, as a critical step in obtaining a social licence to progress interventions through the R&amp;D phase. It is also essential to establish a good baseline around social licence and sentiment monitoring at the very start of the program.</p> <p><i>Deliverables: Stakeholders are actively participating from the start and sentiment towards proposed intervention techniques is established annually for monitoring and future engagement purposes.</i></p>	\$0.4m
Regulation and policy	<p>As many of the proposed interventions will translate to activities never previously considered within the GBRWHA, a review of existing regulatory and policy frameworks is required, followed by an assessment of capacity and training needs for managers and researchers. This activity will also assess risks and required impact assessment needs to ensure permit processes are facilitated for the R&amp;D activities.</p> <p><i>Deliverables: Regulatory and permitting processes are progressing towards a system that is fit for purpose for the proposed interventions also with regards to adequate risk and impact assessment needs.</i></p>	\$0.2m
Modelling	<p>Developing models to improve predictions of the impact of proposed interventions is a core activity. Given the uncertainty caused by climate change, these models will need to consider multiple future scenarios.</p> <p><i>Deliverables: Improved models to guide investment and intervention actions and progress towards a management decision support system relating to restoration and adaptation activities.</i></p>	\$0.6m
Foundational ecological knowledge	<p>The development of models and interventions both require additional ecological knowledge to be gathered. Examples include rates of adaptation and the impact of heritability in populations, impact of sub-lethal bleaching on future survivability, trade-offs between heat and solar radiation and basic demographic processes around larval demographics, survival and growth.</p> <p><i>Deliverables: Data is collected to fill critical ecological knowledge gaps and improve models.</i></p>	\$0.6m
Aquaculture including cryopreservation	<p>Many of these activities rely on annual spawning in November. Activities are focused on improving access to broodstock, tissue and gametes, promoting growth and survival in aquarium settings, investigating genotype/phenotype interactions and improved breeding methods (including hybridisation experiments). Experiments regarding phenotype/genotype interactions will be co-designed with the foundational knowledge activities.</p> <p><i>Deliverables: Methods to rear coral broodstock in aquaculture facilities are improved, access to material has improved through cryopreservation, coral broodstock has improved survivability/stress tolerance.</i></p>	\$2.4m

Activity	Description	Budget
Field based propagation and restoration	<p>As with aquaculture activities, much of this work will need to occur during annual spawning in November. Activities relating to improved settlement survival and deployment require access to coral larvae. Surface improvements, including rubble stabilisation techniques for improved recruitment can only be verified following a spawning event. Baseline recruitment studies will occur in the foundational knowledge component and additional data acquired from this activity will contribute to improving ecosystem models.</p> <p><i>Deliverables: Deployment success of coral larvae from field-based rearing and collections is improved. Progress in the areas of reef substrate condition to increase recruitment and survival.</i></p>	\$1.4m
Solar radiation management	<p>RRAP model predictions indicate that keeping existing corals alive at a large scale would have the biggest impact of all considered interventions. The concept of creating shade through clouds, mist, fog, or surface films assumes that decreased solar radiation protects corals from bleaching. Ecological and physiological factors will be investigated through the foundational knowledge activity. Proof of concepts and assessment of the impact of manipulating solar radiation at scale will underpin risk and environmental impact assessments to be considered under the regulation and policy activity.</p> <p><i>Deliverables: Proof of concept including environmental impact and regulatory assessment.</i></p>	\$1.6m
Systems engineering and integrated logistics	<p>Considerations around centralised versus decentralised facilities and improved cost savings through integrated logistics (large, coordinated field trials, coordination of citizen science with ongoing data collection, improved costing methods) will be an important part of this program. During the first year, the focus will be on determining optimal facility and logistics coordination.</p> <p><i>Deliverable: Logistics and facilities are integrated and optimised.</i></p>	\$0.4m
Automation	<p>Automation of propagation, deployment and monitoring is key to achieve the scale and impact required through this project.</p> <p><i>Deliverable: Automation leads to cost savings and improved capacity to work at large scales.</i></p>	\$0.4m
Traditional Owner-led Reef protection initiatives	<p>The Reef is a biocultural landscape. Knowledge from the past needs to be brought forward to guide future actions. A deep engagement process for Traditional Owners will be developed and implemented with key partners. Overarching governance for Traditional Owner formal engagement in decision-making will include an Advisory Committee (or similar) that would consider issues such as biocultural ethics.</p> <p>Refer to Table 11. This budget figure is also accounted for in the Traditional Owner Reef Protection Component.</p>	\$0.5m
<b>TOTAL INVESTMENT (as recommended by RRAP)</b>		<b>\$34.4m</b>
<b>TOTAL PARTNERSHIP INVESTMENT</b>		<b>\$10.0m</b>



Table 9. RRAS Component Gantt chart for FY2019–2020

Activities	Description	Total	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
<b>Governance and program management</b>		\$1.5m												
Review RRAP recommendations	A very complex set of recommendations will be available from May 2019 and will require extensive review		█											
Governance and agreement	An interim Board will be set up to drive the establishment of a formal governance arrangement and overarching UJV agreement		Board setup		Contracting									
Inception workshops	Initial series of workshops to translate RRAP findings into detailed project plan			█										
Project Planning	Detailed project planning including budget, schedule, milestones, risk assessment, communication protocols and M&E plan				█									
R&D program coordination	Ongoing management of R&D program to start as early as required to enable time critical experiments and studies to take place				█									
<b>R&amp;D Program Delivery</b>		\$8m												
Stakeholder program	Establish reference panels; set up demonstration sites and citizen science programs; implement a Social Licence and Sentiment Monitoring Program	\$0.4m	█											
Regulatory project	Review capacity and training needs to align regulatory processes to anticipated program activities	\$0.2m	█											
Modelling	Start core modelling of ecosystem dynamics with restoration; explore links between model projections and ecosystem services; develop visualisations and DSS	\$0.6m						█						
Foundational ecological knowledge	Gather data from key ecological processes that underpin proposed interventions	\$0.6m						█						
Aquaculture based projects	Activities relating to creating broodstock, access to gametes, propagation, treatment and deployment of larvae, nubbins or micro-fragments	\$2.4m			█									
Moving corals	How to collect, relocate and deploy larvae in the wild and ways to improve settlement and survival of wild caught or aquarium reared larvae on reef substrates	\$1.4m			█									
Solar radiation management	Implement atmospheric surveys to validate physical feasibility; progress key systems engineering and conduct a proof of concept of various sub-atmospheric methods (misting, fogging, polymers)	\$1.6m					█							
Systems engineering	Investigate optimal facility requirements and deployment of preliminary costing study	\$0.4m						█						
Automation	Investigate options for automated monitoring of study sites and vessel mapping and coordination systems	\$0.4m						█						
<b>Traditional Owner-led initiatives</b>		\$0.5m												
Governance	Establish governance arrangement for Traditional Owner-led investments and develop cultural guidelines		█											
Audit	Audit to map current Traditional Owner programs, work, skills and interest			█										
Options development	Mapping opportunity pathways to transition from participation to Traditional Owner-led programs through a co-design process					█								

## RRAS Monitoring and Evaluation

The Final Monitoring and Evaluation Plan provides a comprehensive program logic, which maps activities towards the articulated end of program outcomes for the RRAS component. Success criteria, along with key evaluation questions, and the data collected to evaluate progression towards the articulated outcomes have been developed.

Key evaluation questions relate to measuring how successful the Partnership has been in:

- Prioritising interventions and developing a toolbox of restoration and adaptation techniques ready for investment in implementation at a range of scales.

- Influencing the streamlining of existing regulatory processes and the evolution of regulatory systems and policy to enable the implementation of Reef restoration and adaptation interventions.
- Contributing towards an emerging social consensus for implementation of intervention strategies.
- Progressing the field of reef restoration internationally and providing opportunities for the marine restoration industry.

More details on the RRAS Component program logic and monitoring and evaluation are available in the Final Monitoring and Evaluation Plan.



## 5. Traditional Owner Reef Protection Component – Annual Work Plan

**Budget:** \$42 million<sup>5</sup>

**Purpose:** The purpose of this Component is to improve the engagement of Traditional Owners in the protection of the Great Barrier Reef World Heritage Area.

### Priorities under the Partnership Investment Strategy:

<span style="color: red;">●</span>	Land and sea action and investment planning
<span style="color: grey;">●</span>	Active Traditional Owner-led Reef protection activities
<span style="color: yellow;">●</span>	Indigenous innovation, leadership and collaboration
<span style="color: blue;">●</span>	Sustainable Funding (Futures Fund)

- Build the required competency and capacity in areas that are priorities for Reef management and protection and that represent emerging Traditional Owner business enterprise and industry: Water Quality, Crown-of-Thorns Starfish Control, Reef Restoration and Adaptation Science, and Integrated Monitoring and Reporting Components. Approaches that are founded on Traditional Knowledge and practice form the basis for systems level thinking and changes that are required to support the health and resilience of the Reef. It is also a key first step in moving towards long-term and strategic approaches to funding, design and delivery of land and sea country management programs.
- Set a new standard for co-design with the Reef’s First Nation Peoples through developing an integrated portfolio of Traditional Owner-led Reef protection projects. This work will be done with expert guidance from our New Zealand neighbours who are at the cutting edge of social innovation in co-design for eco-centric systems with local Iwi (people/nation/tribe). Through mentorship, guidance and actioning, the Partnership will build organisational capacity for more effective co-design within the Reef space. As the largest co-design program of its type in Australia we also have the opportunity to create a model for application in other environmental management contexts which involve partnerships between Traditional Owners, government and other groups.

### Overview

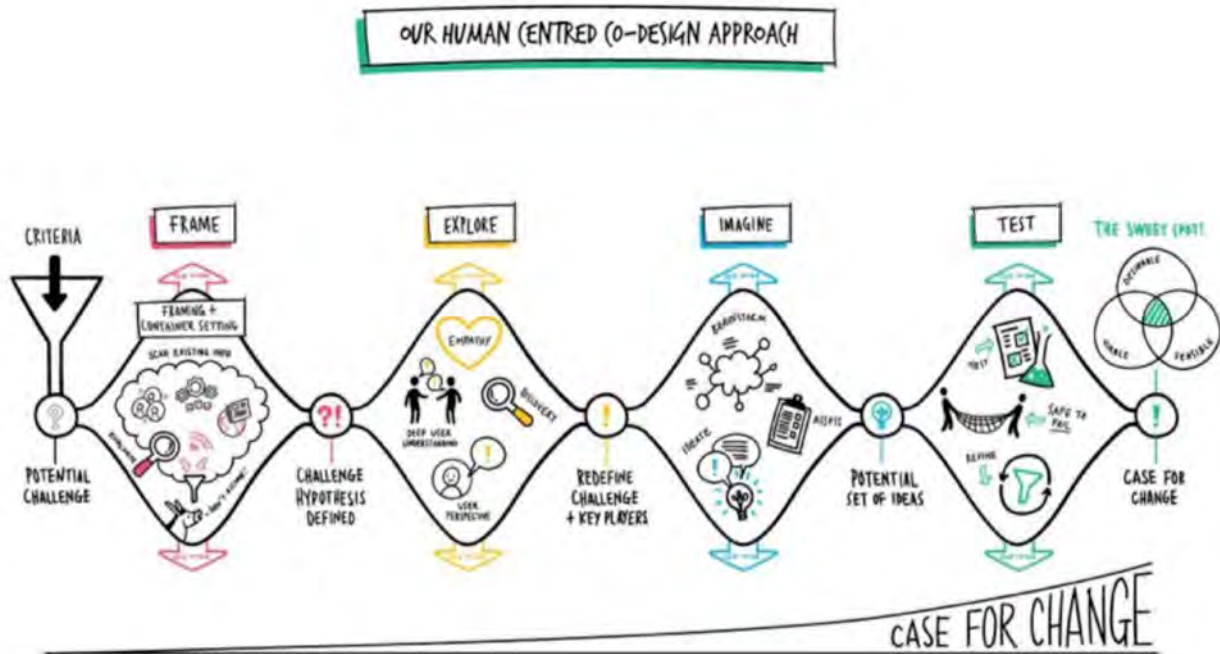
The \$42 million<sup>5</sup> minimum investment in Traditional Owner Reef Protection through the Partnership provides an unprecedented opportunity for Reef Traditional Owners to action key recommendations and priorities for the management of sea country that have been consistently identified and documented, over the past two decades.

This investment will:

- Establish a Traditional Owner funding facility (Futures Fund) that will offer independent resourcing and long-term support for a Reef-wide Sea Country Alliance and engagement framework. This is a critical foundational activity for enhancing localised governance capacity and provides a platform for building strong partnerships and equitable and effective Traditional Owner influence in the co-design of Reef policy and program measures. Through leveraging the Futures Fund, Traditional Owners will be better positioned to either establish, or inform on, the stable delivery of programs that are fit for purpose and support environmental, social, cultural and economic aspirations. This one action alone will provide the conditions of success for delivery of five other key recommendations identified in the recent Reef 2050 Traditional Owner Aspirations Final Report.

<sup>5</sup> The Partnership has made a commitment to allocate a minimum of \$42 million to Traditional Owner Reef protection actions. The exact amount to be allocated is subject to the outcomes of a co-design process with Traditional Owners and Partnership decision-making processes. In the interim, 10% from each of the Components (Water Quality, COTS Control, RRAS and IMR) has been notionally allocated for Traditional Owner-led activities. When combined with the \$12 million allocated from the Community and Traditional Owner Reef Protection Component this equates to \$51.8 million.

Figure 11. Representation of co-design process for Traditional Owner Reef Protection Component from Penny Hagen Auckland Co-design Lab, The Southern Initiative, Auckland Council (www.aucklandco-lab.nz/)



## Process to develop the Annual Work Plan

This package of work has been co-designed in partnership between the GBRF, the Traditional Owner Working Group and other Reef Traditional Owners who attended a three-day planning workshop at AIMS in Townsville in May 2019. This work builds on the recommendations identified in the Final Report from the Traditional Owner Aspirations Project (RRRC 2018) and is consistent with the priorities identified in the Reef 2050 Investment Framework, the Partnership Investment Strategy priorities, and the principles within the Partnership Grant Agreement.

In undertaking work with Traditional Owners of the Great Barrier Reef, the Reef Trust Partnership has committed to a new era of partnership that will genuinely strive to implement a culturally safe and appropriate process of co-design and co-delivery. Traditional Owners have requested this type of partnership and relationship from their key partners when sharing the management of their traditional land and sea country estates – refer to actions BA3; CBA1; CBA2; CBA3 and GA11 of the Reef 2050 Plan.

Program design, incorporating the process of human centred evaluation, will be critical to successful

implementation of a co-designed and co-delivered Reef Traditional Owner Reef Protection Component and cross portfolio work under the Reef Trust Partnership. Although more actively pursued in the health and well-being sectors, co-design and co-delivery with First Nations Peoples within the Australian context of large-scale land and sea management is embryonic in its application – particularly in the context of multiple use protected areas management where government predominantly holds the power base (or authority). Government jurisdictions, scale and management responsibilities relevant to the Great Barrier Reef, and its designation as a multiple-use marine park (and World Heritage Area) with core objectives in protection, ecologically sustainable use, understanding and enjoyment for all, creates a level of complexity rarely seen in other assets. Currently the language of co-design is trending amongst key policy and decision makers – but there is little evidence to demonstrate this has been done effectively within marine protected areas. To fill this gap we will establish strategic partnerships with other organisations from around the world who have demonstrated leadership in both application and innovation within this domain.

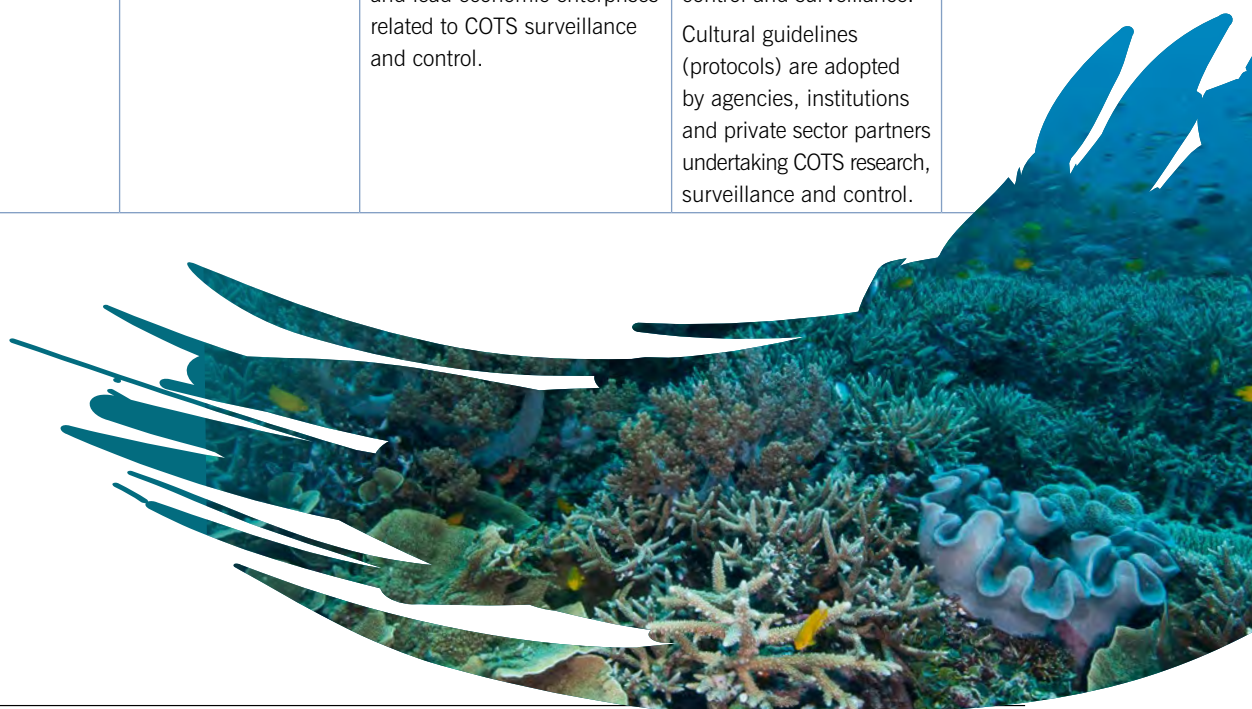
## Five-year plan

Table 10. Traditional Owner Reef Protection Component five-year investment areas and budget

	RTP Component	Partnership Activity	Why?	Outcome	Budget	
(existing commitments are shaded)					<b>TOTAL INVESTMENT</b>	<b>\$51.8m</b>
● Traditional Owner and Community Reef Protection <i>Cross-cutting program activity</i>	Traditional Owner and Community Reef Protection	Formalise governance arrangements for the Traditional Owner Reef Protection Component and cross-components. Strategic communication and engagement. Co-design (co-benefits) Action Framework.	The Partnership is committed to a process of co-design and co-delivery with Traditional Owners of the Reef. Traditional Owner engagement in the Partnership aims to strengthen active participation and decision making. Co-designed programs and projects aim to deliver improvements to equitable outcomes and to maximise co-benefits.	Traditional Owner participation in governance arrangements for protection and management of the Reef is improved. Benefits to Traditional Owners engaged in sea country management improve. Collaborative working arrangements with Traditional Owners which establish mutual trust and build capacity are developed.	\$5m <sup>6</sup>	
● Traditional Owner and Community Reef Protection	Traditional Owner and Community Reef Protection	Establish a Traditional Owner Futures Fund.	Independent and sustainable financing is needed to support governance, future leadership activities (such as student scholarships) and strategic investments which build Traditional Owner capacity and capability in Reef management.	Futures Fund established to support and strengthen the role of Traditional Owners in Reef governance, foster new and sustainable partnerships and promote enduring Reef protection outcomes.	\$10m	
● Traditional Owner and Community Reef Protection	Traditional Owner and Community Reef Protection	Continuation of projects contracted in 2018-2019. Land and sea action and investment planning.	Country-based planning and implementation provides a structured approach for groups to articulate and understand the values and aspirations of their land and sea country for improved management. Indigenous heritage including biocultural systems, culturally significant species and important habitats are mapped and monitored. Traditional Owners connect and learn about culture and country to keep strong.	Traditional Owners' on-country activities contribute to Reef biocultural health. Key Reef heritage values and places are identified, mapped, monitored and reported on. Traditional Owners are supported to collect, store and manage their own Country-based information for decision making.	\$2m	

6 This activity will be funded by contributions from the Traditional Owner investments within the Water Quality, COTS Control, RRAS and IMR components. This figure is therefore not included in the total budget.

	RTP Component	Partnership Activity	Why?	Outcome	Budget
<ul style="list-style-type: none"> <li>●</li> <li>●</li> <li>●</li> </ul>	Water Quality	Indigenous Knowledge systems, innovations, co-design pathways and on-ground actions for healthy water (catchment to reef).	<p>Traditional Owners require better engagement in the Reef 2050 Water Quality Improvement Plan and related funding opportunities.</p> <p>Consideration of Indigenous values in current water quality programs are needed to improve decision making.</p> <p>Adoption of co-design approaches in the Reef Trust Partnership Water Quality Component will improve active participation and maximise benefits for Traditional Owners.</p>	<p>Increased awareness and consideration of Indigenous Knowledge and cultural values in the design and delivery of the Partnership Water Quality Component and broader Reef 2050 Water Quality Improvement Plan programs.</p> <p>An increase in Traditional Owner-led water quality improvement projects.</p> <p>Water quality programs incorporate education and employment pathways for Traditional Owners.</p>	\$20m
<ul style="list-style-type: none"> <li>●</li> <li>●</li> <li>●</li> </ul>	Crown-of-Thorns Starfish Control	Establishing clear pathways for Traditional Owners to achieve culturally-grounded economic enterprises for effective COTS surveillance and control.	<p>There is a recognised need for Traditional Owner groups to be directly involved in decision making and management of reefs and activities on their sea country.</p> <p>There is a need to create culturally appropriate pathways for Traditional Owners to increase employment opportunities, build partnerships, co-design programs, diversify skillsets and lead economic enterprises related to COTS surveillance and control.</p>	<p>A pathway with clear steps for Traditional Owners to achieve culturally-grounded economic enterprises for effective COTS surveillance and control is established.</p> <p>Progression towards Traditional Owner enterprises being included on the preferred panel of providers for COTS control and surveillance.</p> <p>Cultural guidelines (protocols) are adopted by agencies, institutions and private sector partners undertaking COTS research, surveillance and control.</p>	\$5.8m



	RTP Component	Partnership Activity	Why?	Outcome	Budget
● ● ●	Reef Restoration and Adaptation Science	<p>Establish Traditional Owner-led governance arrangements for strategic and cultural oversight of this component.</p> <p>Deep engagement with Traditional Owners to develop guidelines, foundational principles and implementation of practices to ensure respect for biocultural ethics.</p> <p>Implement actions to diversify skillsets, build capacity, enable Indigenous-led research and to formalise education and employment pathways.</p>	<p>Traditional Owners hold inherent rights to the Reef and have successfully cared for their traditional homeland estates since time immemorial. Over the last century they have witnessed increased pressures and a changing environment. This carries with it a deep sadness for the loss of their healthy Country. Traditional Owners must therefore form part of the solution to improve the health of the Reef.</p> <p>There is a need to create culturally appropriate pathways and make resources available for Traditional Owners to diversify skillsets, build capacity, contribute to and lead research, and to formalise education and employment pathways to heal country and people.</p>	<p>Traditional Owner biocultural ethics guide participation through established governance arrangements.</p> <p>Traditional Owners' on-country activities contribute to Reef health and resilience.</p> <p>Engagement with Traditional Owners builds strong mutual understanding of risks and benefits.</p> <p>Biocultural guidelines, principles and practices are adopted by agencies, institutions and private sector partners undertaking Reef restoration and adaptation activities.</p> <p>Education and career pathways are embedded in programs across all phases of delivery.</p>	\$10m
● ● ●	Integrated Monitoring and Reporting	<p>Implement the Strong Peoples-Strong Country Framework; including: negotiation of data sharing agreements; audit of monitoring skills, tools and assets; and development and implementation of education and employment pathways.</p>	<p>Traditional Owners are the keepers of Indigenous Knowledge and cultural values and have observed dramatic changes on their country.</p> <p>The Strong Peoples-Strong Country Framework provides the basis for understanding the Reef as a biocultural ecosystem and requires investment to develop indicators to understand the condition and status of Indigenous heritage in the Reef.</p> <p>There is a need to resource Traditional Owners to build capacity and diversify skill sets to enable recording and appropriate sharing of Indigenous Knowledge and information.</p>	<p>Culturally-grounded approaches to monitoring, evaluation and reporting are embedded across the Partnership.</p> <p>Data sharing agreements are established to ensure Traditional Owner's Intellectual Property is protected and information about Indigenous Knowledge and cultural values are safeguarded and shared appropriately.</p> <p>Greater opportunities and increased capacity and capability for Traditional Owners to undertake monitoring are provided.</p>	\$4m
<b>TOTAL INVESTMENT</b>					<b>\$51.8m</b>

**Note:** In addition to the Traditional Owner specific outcomes described in Table 10 above, each of the specific Partnership Components described in this table (Water Quality, COTS, RRAS and IMR) will also deliver the outcomes listed in the five year plans relating to each of these individual components – e.g. for Water Quality this will include reductions in dissolved inorganic nitrogen, fine suspended sediments and pesticides in priority locations.

## Financial year 2019-2020 work plan

Table 11. Traditional Owner Reef Protection Component investment areas and budget for FY2020

Activity	Description	Budget
(existing commitments are shaded)		<b>TOTAL INVESTMENT</b>
		<b>\$16.3m</b>
Stage 1 Traditional Owner Grant Round	Ongoing delivery and management of Traditional Owner Grant Round 1 projects focused on land and sea country action and investment planning.	\$0.7m
Establish program governance	Review interim working group arrangements to ensure they remain fit-for-purpose – includes mapping existing Indigenous governance arrangements relevant to the Reef. Build coordination to create shared understandings. Establish additional sub-group governance arrangements to address each Component and create linkages.  <i>Deliverables: Audit of existing Indigenous governance arrangements; GBRF Traditional Owner Working Group; governance arrangements in place to oversee Water Quality, COTS, RRAS and IMR components; improved coordination and linkages through knowledge sharing and collaboration. Traditional Owner co-design, oversight and delivery of relevant Partnership components.</i>	\$0.3m
Strategic communication and engagement of Great Barrier Reef Traditional Owners	Effective communication and engagement of Reef Traditional Owners will remain a critical priority throughout the Partnership. Four regional workshops will be held in the Far Northern, Northern, Central and Southern Great Barrier Reef. Work will commence towards hosting a Reef-wide forum on Magnetic Island in September 2020, as well as developing a collaborative communication platform to support a range of authorised interactive multi-media content. A specialised focus on building communication and engagement skills of women and youth will be offered. This work collectively aims to deepen the understanding of the Partnership opportunity, position Traditional Owners for co-design, as well as raise the profile of Reef Traditional Owners; connect people, projects and programs; and keep culture strong by promoting, sharing and celebrating Traditional Owner stories.  <i>Deliverables: Reef Traditional Owners active participation through four regional workshops; a deeper understanding and uptake of the Partnership opportunity including the Co-Design Action Framework and progression of all Component work, including the Traditional Owner Futures Fund. Specialised communication training provided to women and youth. Collaborative communication platform initiated.</i>	\$0.6m
Reef Traditional Owner-led Co-Design Action Framework	Continue developing the Reef co-design (co-benefit) framework with Traditional Owners, Reef 2050 Partners and the broader community. Establish a formal mentorship and collaborative partnership with the NZ CoDesign Lab (Auckland Southern Initiative).  <i>Deliverables: Guidance is mapped and recorded through a formal collaborative partnership with experts in the field. Prototypes – including (but not limited to) co-design principles, tools and resources – are developed and benchmarked. Skills, behaviours and practices required to support progression across the framework are mapped. Co-design principles and tools are tested and refined.</i>	\$0.1m
Initiate a Traditional Owner funding facility: Futures Fund	As part of an innovative leadership initiative the Traditional Owner Working Group will be supported to oversee the scoping, design and initial phase of establishing a Reef Traditional Owner Futures Fund. The purpose of this Fund is to offer independent resourcing and sustainable financing for a Reef Traditional Owner Sea Country Alliance and engagement framework. It may also support Reef protection activities and leadership measures (e.g. scholarships) and agreed governance arrangements. This will involve working closely with Reef 2050 partners who continue to lead consideration of a Reef-wide Traditional Owner Sea Country Alliance and engagement framework.  <i>Deliverables: Business model options identified; Reef Traditional Owners' advice sought and recorded on preferred option(s); investment actions and progress made towards establishing a Reef Traditional Owner Futures Fund.</i>	\$10m



Activity	Description	Budget
Traditional Owner-led Water Quality Improvements-Healthy Water	<p>This work aims to improve Traditional Owner decision-making and participation in on-ground water quality activities as well as to address known information gaps around Traditional Owner values (cultural and other) associated with water sources.</p> <p><i>Deliverables: An audit that maps Traditional Owner skills, interest and current work in WQ. Options paper that identifies implementation pathways for capacity building, culturally appropriate training and leadership programs. Development and delivery of a fit for purpose grant program or EOI process to deliver WQ component objectives. Cultural mapping project to scope how Indigenous Knowledge and cultural values of waterways can be shared and considered in the design and delivery of WQ programs commenced. Potential for negotiated Traditional Owner data sharing agreements.</i></p>	\$1.8
Traditional Owner-led Crown-of-Thorns Starfish Control	<p>This component will support activities that aim to improve Traditional Owner decision-making and participation in COTS control activities. The Partnership will fund viable Traditional Owner groups' contributions to in-water COTS control activities, and where required fund established or new training and service delivery partnerships.</p> <p><i>Deliverables: An audit of Traditional Owner skills, interest and current work in this component. Cultural guidelines developed for adoption in current COTS research, surveillance and control programs including development and use of new technologies. Report commissioned that maps opportunity pathways to transition from participation to Traditional Owner-led programs through a co-design process; identification of required standards for successful operations (such as Standards of Operations for Panel of Providers); report on how to attract and retain Traditional Owners and other Indigenous people within this employment field. Traditional Owners contribute to in-water control activities. Training and service delivery partnerships in place.</i></p>	\$0.5m
Traditional Owner-led Reef Restoration and Adaptation activities	<p>The Reef is a biocultural landscape. Knowledge from the past needs to be brought forward to guide future actions. A deep engagement process for Traditional Owners will be developed and implemented with key partners. Overarching governance for Traditional Owner formal engagement in decision-making will include an Advisory Committee (or similar) that would consider issues such as biocultural ethics.</p> <p><i>Deliverables: Develop and implement engagement process to build a strong understanding of the program, its proposed activities, risks and benefits. Develop biocultural guidelines, foundational principles and implementation practices. Develop culturally appropriate education and employment pathways. Scope research and development of Traditional Owner innovations from Indigenous Knowledge systems and identify transitional pathways.</i></p>	\$0.5m
Traditional Owner-led Integrated Monitoring & Reporting	<p>Traditional Owner knowledge forms a critical part of building a holistic understanding on the condition and trend of Reef values. This component will continue to support the finalisation and implementation of the Strong Peoples-Strong Country Framework developed through RIMReP by the Reef Traditional Owner Indigenous Heritage Expert Group (with project management provided by CSIRO). Implementation will include developing a broader set of Traditional Owner identified objective indicators that can be used to monitor the condition and status of Indigenous heritage; as well as resourcing made available for Traditional Owner groups to negotiate data sharing agreements as part of a pilot program for the Framework.</p> <p><i>Deliverable: Re-establish the Indigenous Heritage Expert Working Group. Strong Peoples-Strong Country Framework priorities are identified. A set of Traditional Owner identified objective indicators to monitor the condition and status of Indigenous heritage are developed. Data sharing agreements negotiated with Traditional Owners participating in the pilot program.</i></p>	\$1.8m
<b>TOTAL INVESTMENT</b>		<b>\$16.3m</b>

Table 12. Traditional Owner Reef Protection Component Gantt chart for FY2019–2020

Activities	Description	Budget	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
<b>Contract and relationship management of grants (2018-2019 investments)</b>		\$1.8m												
Grants management	Ongoing management of 2018-2019 financial year investments. Reporting, payments and communication.		[Bar spanning July to June]											
<b>Program governance</b>		\$0.3m												
Review governance	Audit of existing Indigenous governance arrangements.		[Bar spanning July to Dec]											
Establish governance	Establish governance arrangements to oversee WQ, COTS, RRAS and IMR Components.		[Bar spanning Dec to May]											
<b>Reef Traditional Owner-led Co-design Action Framework</b>		\$0.1m												
Mentorship and guidance	Establish formal mentorship and partnership with experts. Guidance is mapped and recorded.		[Bar spanning July to Dec]											
Prototyping and testing	Co-design principles, tools and resources are developed and benchmarked.		[Bar spanning Dec to June]											
<b>Establish Reef Traditional Owners Futures Fund</b>		\$10.0m												
Governance arrangements	Utilise Traditional Owner Working Group and GBRF staff to oversee the design of options for the Futures Fund.		[Bar spanning July to Oct]											
Develop business case for Futures Fund	Define Futures Fund's purpose and scope and develop business model and implementation plan for operation and governance.		[Bar spanning Sep to Mar]											
Co-investment strategy	Identify potential donors and key Futures Fund design elements that will influence the willingness to invest in the Fund.		[Bar spanning July to Mar]											
Co-investment commitment	Following development of business case for Futures Fund, seek firm commitment by co-investors to support the Fund's establishment.		[Bar spanning Mar to June]											
<b>Strategic communication and engagement</b>		\$0.6m												
Plan development	Development of strategic communication and engagement plan.		[Bar spanning July to Dec]											
Collaborative communication platform	Development of a collaborative communication platform to support a range of authorised interactive multi-media content.		[Bar spanning July to June]											
Regional workshops	Effective communication and engagement of GBR Traditional Owners through four regional workshops will be held in Far Northern, Northern, Central and Southern Great Barrier Reef.		[Four small bars: Aug, Oct, Feb, Mar]											
<b>Traditional Owner-led WQ improvements - Healthy Water</b>		\$1.8m	See activity details in Gantt chart for Water Quality Component											
<b>Traditional Owner-led COTS Control</b>		\$0.5m	See activity details in Gantt chart for COTS Control Component											
<b>Traditional Owner-led Reef Restoration and Adaptation activities</b>		\$0.5m	See activity details in Gantt chart for RRAS Component											
<b>Traditional Owner-led Integrated Monitoring &amp; Reporting</b>		\$1.8m	See activity details in Gantt chart for IMR Component											

## Traditional Owner Reef Protection Component Monitoring and Evaluation

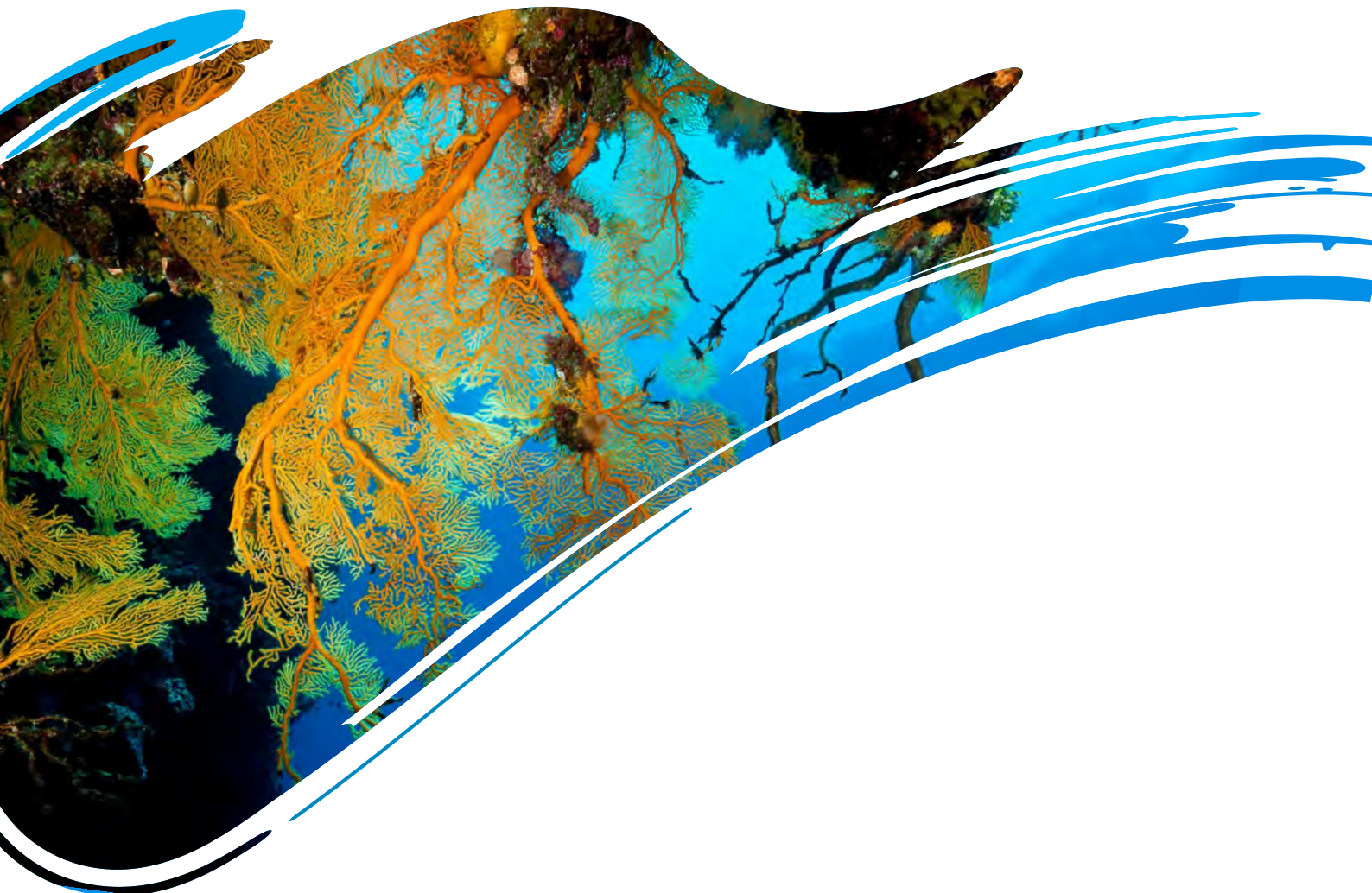
The Final Monitoring and Evaluation Plan provides a comprehensive program logic, which maps activities towards the articulated end of program outcomes for the Traditional Owner Reef Protection Component. Success criteria, along with key evaluation questions, and the data collected to evaluate progression towards the articulated outcomes have been developed.

Key evaluation questions relate to measuring how successful the Partnership has been in:

- Establishing and making operational a Traditional Owner funding facility that will offer independent resourcing and long-term support for a Reef-wide Sea Country Alliance and engagement framework.
- Setting a new standard for co-design with the Reef's First Nations Peoples through developing an integrated portfolio of Traditional Owner-led Reef protection projects.

- Building the required competency and capacity in areas that are priorities for Reef management and protection and that represent emerging Traditional Owner business enterprise and industry.
- Supporting Traditional Owners in the collection, storage and management of their own Country-based information for decision-making.
- Improving Traditional Owners' participation in governance arrangements for protecting and managing the Reef.

More details on the Traditional Owner Reef Protection Component program logic and monitoring and evaluation are available in the Final Monitoring and Evaluation Plan.







## 6. Community Reef Protection Component – Annual Work Plan

**Budget:** \$10 million

**Purpose:** The purpose of this Component is to improve the engagement of the broader community in the protection of the Great Barrier Reef World Heritage Area.

### Priorities under the Partnership Investment Strategy:

	Strengthening and accelerating on-ground action
	Building understanding, hope and action
	Connecting community with decision making
	Fostering enduring outcomes through funding, next generation participation and partnerships

### Overview

Australians have a strong sense of connection with the Great Barrier Reef. A multitude of people and organisations are delivering local actions to help protect the Reef and want to do more. Many others are acutely aware that the Reef is in trouble, but do not know what they can do to help make a difference. The Community Reef Protection Component aims to increase the positive impact that local action has for the Great Barrier Reef and for communities.

This will be achieved by making it easier for people to get involved and stay involved in conservation of the Reef (irrespective of where they live); improving sharing, connection and collaboration between individuals, community groups and Reef management; and providing hope that inspires greater action by demonstrating that the collective efforts of many can and will make a difference.

The Partnership will provide the environment to enable those already doing great work to do more, go faster and deliver enhanced impact. To facilitate this, more than 85% of the investment in this Component will support others to deliver or enhance on-ground projects, ranging from local reef restoration, to positive place-based actions on climate change, to citizen science. The remaining funds will enable essential underpinning activities such as strategic coordination, capacity building, and inclusive community-based planning processes to strengthen outcomes. These activities are highly interconnected and will reinforce each other, working through complementary channels.

By the end of the Partnership (2024), the program will deliver the following end of program outcomes (Figure 12):

- Dynamic suite of tools for enduring funding and partnerships for community action are available.
- Community action is more widely recognised, valued and celebrated for the range of benefits provided to support Reef resilience.
- Community action is delivering more effective outcomes for the Reef and community (including Partnership outcomes).
- More targeted local action aligns with strategic needs and complementary approaches.
- Shared knowledge and decision making enhances governance and delivery models.

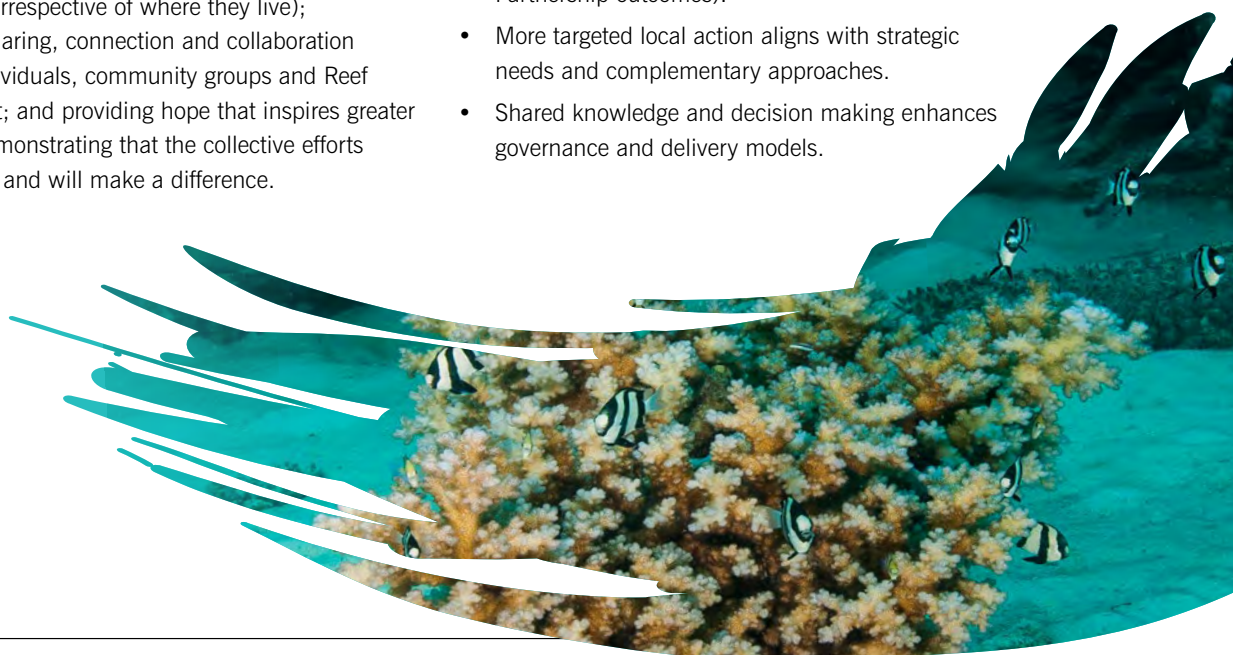
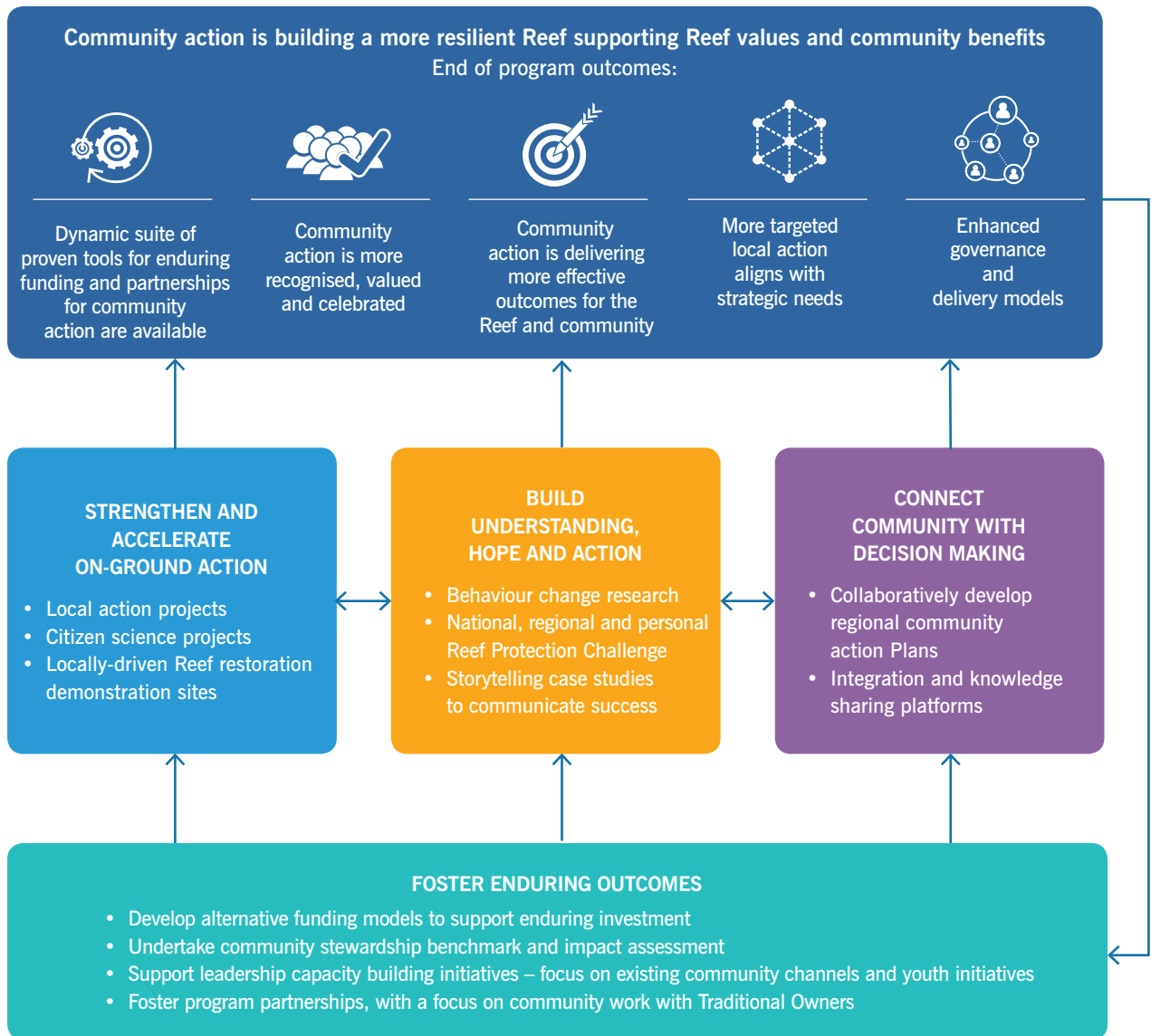


Figure 12. Community Reef Protection Component five-year program overview and outcomes



## Process to develop the Annual Work Plan

A Community Reef Protection Working Group has been established to support strategic planning and consultation processes as part of the Reef Trust Partnership. The Investment Strategy and Annual Work Plan are grounded in the Reef 2050 Plan’s Community Benefit focal areas. Other work informing the understanding of Reef stewardship activities and perspectives were also utilised to inform Work Plan development, including: Citizen Science in the Great Barrier Reef: A Scoping Study (Chin 2013); A review of active citizen science programs in the Great Barrier Reef and adjacent catchments (Mehrtens 2017);

Final Report: Trialling an Assessment and Monitoring Program for the Human Dimensions of the Reef 2050 Integrated Monitoring and Reporting Program (Gooch et al 2018); Social and Economic Long Term Monitoring Program (Marshall 2018); Tourism and Events Queensland’s Great Barrier Reef Framework 2018-2025; Queensland Climate Adaptation Strategy – Building a resilient Tourism Industry: Queensland Tourism Climate Change Response Plan (Becken et al 2018); Great Barrier Reef Blueprint for Resilience (GBRMPA 2017); and a GBRF Communication Customer Research study (GBRF with assistance from KPMG, 2018).



To further document and consider the range of Traditional Owner groups and stakeholders engaged in Community Reef protection, a desk-top Great Barrier Reef Landscape Audit (GBRF 2018) of activities and engagement occurring on the Great Barrier Reef and across its catchment was undertaken. This outlined focus areas, activities and communication pathways for Traditional Owners, community and sector-specific activities and engagement. This audit informed the consultation process and identified opportunities, as well as highlighting gaps. Wherever possible, the approach in developing community Reef protection investment strategies was to communicate through, and seek to strengthen, existing channels for community work. This approach highlights the role of this Component as a platform for connecting the community sector to amplify and accelerate Reef protection outcomes.

The development of the Monitoring & Evaluation Plan, including creation of a comprehensive program logic,

was used to identify and target critical action pathways to deliver proposed end of Program outcomes.

The logic pathways were grounded in social science theories of change and approaches to integrate robust planning for community Reef protection. Two series of engagement meetings were undertaken with the 12 Great Barrier Reef Marine Park Authority's Local Marine Advisory Committees (LMACs) to respond to questions, hear feedback on local perspectives, and receive written documentation from each LMAC on key local Reef threats of concern to support grant project planning processes. Feedback from the three-day Traditional Owner planning workshop in May 2019 also informed development. Moving forward, the Community Reef Protection Component will continue to work with the Traditional Owner Working Group of the Partnership to identify opportunities and facilitate genuine co-design and co-benefits to foster Traditional Owner and community participation and collaboration in Reef protection.

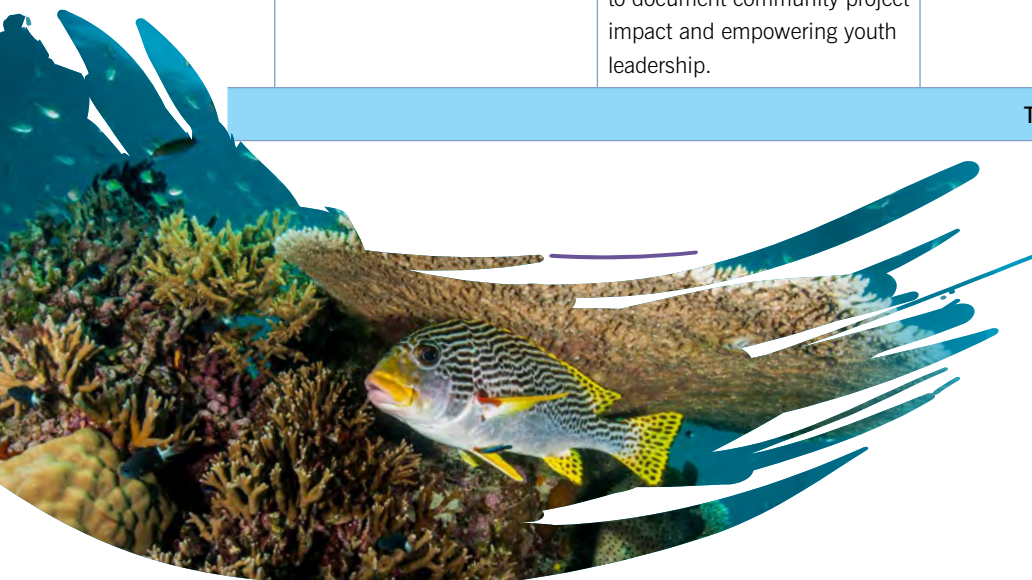
## Five-year plan

Table 13. Community Reef Protection Component five-year investment areas and budget

Partnership Activity	Why	Outcome	Budget
			\$10m
<ul style="list-style-type: none"> <li>Citizen science: Support strategic and collaborative citizen science data collection, reporting and application</li> </ul>	<p>Citizen science can address priority data needs for science, management and community, as well as provide a platform for effective partnerships and place-based approaches that align with the broader Reef 2050 Plan. Yet while citizen science is gaining momentum, there is much greater potential for data from programs to inform management and offer greater community benefits.</p>	<p>A framework for strategic citizen science projects will:</p> <ul style="list-style-type: none"> <li>enhance how community informs, and is informed by, local/regional decision-making</li> <li>increase community understanding about Reef health</li> <li>boost community benefits and partnerships, and enhance efficacy in Reef stewardship.</li> </ul>	\$3.02m
<ul style="list-style-type: none"> <li>Local Reef restoration: Support development and implementation of local Reef restoration demonstration sites</li> </ul>	<p>Reef restoration has been identified as an important emerging priority for the Reef. There is high interest from the community to support this work.</p>	<p>A series of Reef restoration demonstration sites will be identified and piloted with Reef community partners (particularly tourism, Traditional Owners and community groups). Best-practice local-scale restoration methods will be shared and refined – including improved measures of success spanning environmental, social, economic and cultural indicators.</p>	\$1.1m

Partnership Activity	Why	Outcome	Budget
<ul style="list-style-type: none"> <li><span style="color: purple;">●</span> Local action projects: Support collaborative community</li> <li><span style="color: teal;">●</span> projects to address local</li> <li><span style="color: lightblue;">●</span> Reef threats using strategic, place-based approaches</li> </ul>	<p>GBRMPPA's Local Marine Advisory Committees already provide a platform to directly connect community with decision-making and offer a network for scalable approaches to implement regional Reef Blueprint priorities. Providing support for inclusive project planning can further activate and empower this network of dedicated community members.</p>	<p>Projects will increase ownership, knowledge-sharing and collaboration to deliver local actions on priority Reef threats, and wider benefits across Reef communities. Projects will trial and embed frameworks for collective action and enhance engagement (including youth) in this Reef-wide community advisory network.</p>	<p>\$1.67m</p>
<ul style="list-style-type: none"> <li><span style="color: purple;">●</span> Integrated decision-making: Facilitate pathways and platforms to foster knowledge exchange and develop regional Community Action Plans for Reef protection projects</li> </ul>	<p>Effective integration of top-down and bottom-up approaches can help to deliver key management priorities as well as recognise and foster the important role of community action. Promoting exchanges to clarify understanding and opportunity will help to drive more effective local-scale actions and integration with broader Reef and catchment-wide management approaches. This will build on RIMReP and other strategic frameworks.</p>	<p>Community Action Plans will provide inclusive, integrated and adaptive frameworks for Community Reef protection efforts that deliver against key Reef management priorities. Duplication of efforts will be decreased. New/strengthened partnerships will be formed between community groups and managers/policy-makers. Community will have greater ownership of plans and outcomes.</p>	<p>\$1m</p>
<ul style="list-style-type: none"> <li><span style="color: yellow;">●</span> National Reef Protection</li> <li><span style="color: lightblue;">●</span> Challenge: Develop and implement a collaborative initiative to support targeted behaviour change to protect the Reef.</li> </ul>	<p>Australians are proud of the Reef and feel a sense of responsibility to protect it, but many do not feel optimistic about its future. Despite the demonstrated interest in stewardship actions, many people feel they do not have the necessary knowledge and skills to reduce impacts they have on the Reef (Marshall et al 2017). This initiative will foster wide-scale participation in a Reef protection challenge to deliver measurable behaviour change outcomes to address key threats at multiple scales – personal, local, and nationwide.</p>	<p>The first national-scale Reef protection challenge will:</p> <ul style="list-style-type: none"> <li>• Build positive attitudes, intention and participation in targeted behaviours that reduce Reef threats</li> <li>• Build hope for the future of Reef resilience through collective action</li> <li>• Build partnerships and efficacy across community networks such as tourism, councils, education, community groups, local business.</li> </ul>	<p>\$2.48m</p>

Partnership Activity	Why	Outcome	Budget
<ul style="list-style-type: none"> <li>● Communicate case studies and stories of hope</li> </ul>	<p>Capturing and sharing community-driven solutions from a range of people and projects has been identified as a key need to celebrate success and inspire increased engagement.</p>	<p>Partnership communication and mass communication will support a knowledge sharing network. Communicating positive outcomes will demonstrate progress, acknowledge the work of individuals and community organisations and motivate others to get involved.</p>	<p>\$0.07m</p>
<ul style="list-style-type: none"> <li>● Support enduring investment and partnership models:</li> <li>● Enhance community Reef protection models to foster long-term organisational sustainability, impact and investment</li> </ul>	<p>While extensive work is taking place across communities, there is no comprehensive benchmark that documents community stewardship effort and impact across the Reef and its catchments. Addressing the challenge of small, inconsistent grant-based funding for community Reef protection activities has been identified as a key barrier to achieving more efficient and enduring outcomes.</p>	<p>A dynamic suite of tools to inform Community Reef protection partnerships and investment models will be developed and made available. A stewardship audit and impact assessment will create a baseline for celebrating current work, showcasing greater potential, and measuring changes in stewardship actions delivered with partners through the Reef Trust Partnership.</p>	<p>\$0.13m</p>
<ul style="list-style-type: none"> <li>● Empower community heroes:</li> <li>● Identify and deliver key capacity building needs for individuals &amp; organisations to amplify partnerships and leadership</li> </ul>	<p>Addressing shared challenges and areas for growth can boost how the community can contribute to Reef protection. The following areas have been identified: cultural capacity building to foster greater partnership opportunities with Traditional Owners, enhanced monitoring and evaluation skills to document community project impact and empowering youth leadership.</p>	<p>Capacity building initiatives will strengthen individual, organisational and sector-wide capacity to support place-based, sector-based and youth empowerment activities with the goal to enhance community stewardship outcomes.</p>	<p>\$0.53m</p>
<b>TOTAL INVESTMENT</b>			<b>\$10m</b>





## Financial year 2019-2020 work plan

Table 14. Community Reef Protection Component investment areas and budget for FY2020

Activity		Budget
(existing commitments are shaded)		\$2.634m
Support citizen science grants (existing 2018-2019 year investments)	The delivery of 2018-2019 year investment citizen science projects will continue in the 2019-2020 FY. <i>Deliverables: Distribute payments for ongoing project activities in accordance with reporting (\$0.7m). GBRF will also provide ongoing operational and strategic support for grant projects including partnerships, strategic advice, monitoring, evaluation and communication.</i>	\$0.7m
Reef tourism workshops and capacity building initiatives	With the potential to reach >2 million visitors to the Reef each year, the tourism industry has a critical role to play in engaging Reef visitors in conservation activities. The industry is already supporting Reef protection activities, yet there are further opportunities to enhance capacity for how best practice citizen science and Reef conservation communication are delivered. <i>Deliverables: Planning and capacity building initiatives will be developed to address key needs and opportunities identified with the tourism sector.</i>	\$0.03m
Local reef restoration grants	These demonstration sites will align with the RRAS Component to support tourism, community groups, Traditional Owners and other stakeholders to work with scientists to develop, implement, monitor and communicate local reef restoration projects to foster shared learnings and enhanced benefits. <i>Deliverables: Best-practice local reef restoration demonstrated and learnings shared</i>	\$0.5m
Support local action grants (existing 2018-2019 investments and proposed 2019-2020 round)	Local Marine Advisory Committees provide a platform for connecting with a wide range of local perspectives and knowledge, creating a network for a collective action approach. <i>Deliverables: Ongoing support for the 2018-2019 year investment Catalysing Local Action package. Deliver a second project funding round to support collaborative development of key actions to reduce local Reef threats, based on learnings and feedback from phase 1.</i>	\$0.3m <sup>6</sup>
Community Action Plan workshops, pilot projects and community data integration	This project will be facilitated with regional report card partnerships, Natural Resource Management bodies, Queensland Government, the Great Barrier Reef Marine Park Authority, and diverse community representation. These inclusive planning and pilot processes aim to connect community with decision making and help support strategic planning, implementation and reporting for high-impact Community action. Community data reviews will also be undertaken with a view to explore new applications and opportunities for community-collected data and information. <i>Deliverables: A minimum of 5 Community Action Plans will be developed and piloted through a collaborative process to provide a shared vision and decision framework for coastal and marine citizen science and community on-ground action focused on report card Partnership regions.</i> <i>Approach developed and priority actions implemented with report card Partnership Technical Working Groups and RIMReP regarding community data integration opportunities.</i>	\$0.5m

<sup>6</sup> This includes \$0.15M of already committed funds and \$0.15M of funds to be committed in 2019-20

Activity		Budget
Behaviour change research and developing partnerships for the National Reef Protection Challenge	<p>To date, there has not been a national-scale behaviour change initiative to support the resilience of the Great Barrier Reef. Implementing a behaviour change program at this scale, with personal, regional and nationwide relevance will require a coordinated approach grounded in the best environmental psychology and behaviour change research.</p> <p><i>Deliverables: A behaviour change framework including a monitoring and evaluation plan for target behaviours is developed in consultation with experts and partners in readiness for a program launch in FY 2021.</i></p>	\$0.35m
Communicating case studies and stories of hope	<p>Our communications approach will aim to connect with both those already involved and those seeking to be involved in Reef protection activities to portray the challenge, opportunity and successes to inspire greater action.</p> <p><i>Deliverables: Working with grant recipients and partners, high-impact case studies and stories from projects and individuals will be developed and shared. A knowledge sharing network will be supported to enhance communication and partnerships across projects.</i></p>	\$0.024m
Reef stewardship impact assessment and program models scoping study	<p>There is no single snapshot that captures and documents the collective effort of community Reef protection. This, along with investigating proven global resourcing and partnering models for community work will help to inform more strategic frameworks and sustained funding for community Reef protection activities to maximise enduring benefits.</p> <p><i>Deliverables: A Reef-wide audit and impact assessment of community stewardship will provide a benchmark for measuring change, prioritising opportunities and showcasing the critical role of community in Reef protection. A global audit of models for resourcing and partnering in community projects will inform alternative program models to pilot.</i></p>	\$0.13m
Community sector leadership development support	<p>Leadership initiatives for targeted capacity needs in the community Reef protection sector (e.g. Monitoring &amp; Evaluation, cultural capacity training, communication, fundraising) will be selected with feedback from the sector to help progress Partnership outcomes and enable enduring advancement.</p> <p><i>Deliverables: Use sector feedback to identify, implement and evaluate two initiatives to grow and strengthen sector-wide leadership.</i></p>	\$0.05m
Youth leadership initiatives	<p>Recent movements such as the 2019 School Strike 4 Climate demonstrate the growing demand from youth to contribute to decisions and actions that impact their future. This annual investment in youth leadership initiatives will empower those under 25 to contribute to stewardship activities and build conservation leadership skills.</p> <p><i>Deliverables: Identify and deliver youth leadership activities through the Partnership including mechanisms to contribute to the Working Group, the planning processes for each of the five regional Community Action Plans, and funded projects.</i></p>	\$0.05m
		<b>\$2.634m</b>

**Note:** There is a high degree of interconnectedness between the activities and investments described in the table above which may not be immediately obvious in the table format. For example, activities such as the Reef stewardship audit and community data integration are key enablers, communicating stories of hope provides the mechanism for amplifying education and stewardship messages across all activities, and investment in youth and community sector leadership is essential for delivering enduring outcomes.

Table 15. Community Reef Protection Component Gantt chart for FY2019–2020

Activities	Description	Budget	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		
<b>Strengthening &amp; accelerating on-ground actions</b>		\$1.5m														
Citizen science projects granted in 2018-2019	Ongoing delivery of 2018-2019 financial year investments.	\$0.6m	[Ongoing delivery bar]													
Local action projects granted in 2018-2019	Ongoing delivery of 2018-2019 financial year investments.	\$0.1m	[Ongoing delivery bar]													
Local Reef restoration grants	Funding round to support Community to work with RRAS to implement best-practice local reef restoration demo sites.	\$0.5m											Scoping	Call for proposals		
Local action grants	Second funding round for collaborative development of key actions to reduce local reef threats based on phase 1 learnings.	\$0.3m							Consultation and scoping			Delivery				
<b>Connecting community with decision making</b>		\$0.5m														
Citizen science and community action	Consultancy delivering review of citizen science and community action data to inform approaches for increased uptake	\$0.1m	Scoping and procurement			Delivery										
Community Action Plan workshops	Community Action Plans to be developed collaboratively to provide shared vision and decision framework for citizen science and community on-ground action.	\$0.4m	Consultation			Design					Delivery					
<b>Building understanding, hope and action</b>		\$0.374m														
National challenge framework	Consult on and construct national challenge framework for multi-scale program launch in FY2021.	\$0.35	Consultation						Design							
Communicating case studies and stories of hope	Consult on and design communication approach with partners and grant recipients to deliver high-impact case studies & stories.	\$0.024	Consultation		Design		Delivery									
<b>Foster enduring outcomes</b>		\$0.26m														
Reef stewardship audit, impact assessment and business models scoping study	Reef-wide audit of community stewardship to create a benchmark for measuring change, prioritising opportunities and scope enduring business models for Reef protection.	\$0.13m	Procurement		Delivery											
Tourism workshop & capacity building initiatives	Enhance capacity of tourism operators to deliver best practice citizen science and Reef conservation communication.	\$0.03m											[Workshop bar]			
Community sector leadership development support	Ongoing delivery including workshops to address targeted capacity needs in the Community Reef protection sector.	\$0.05m	[Ongoing delivery bar]													
Youth leadership initiatives	Developed and implemented with partners to complement/ strengthen existing initiatives-may link to regional Reef blueprints.	\$0.05m	[Ongoing delivery bar]													

## Community Reef Protection Component Monitoring and Evaluation

The Final Monitoring and Evaluation Plan provides a comprehensive program logic, which maps activities towards the articulated end of program outcomes for the Community Reef Protection Component. Key evaluation questions, and corresponding rubrics have been developed to evaluate success for end of program outcomes, along with data to be collected to monitor progress towards the identified outcomes.

Key evaluation questions relate to measuring how successful the Partnership has been in:

- Facilitating approaches to share knowledge and connect community with decision making to enhance governance and delivery models that can help deliver more targeted and strategic local action

- facilitating increased community engagement to deliver more effective outcomes for the Reef (including Partnership outcomes)?
- increasing recognition for the value of community action and the community benefits it provides?
- providing a dynamic business model to foster enduring funding and partnerships for community action.

More details on the Community Reef Protection Component program logic and monitoring and evaluation are available in the Final Monitoring and Evaluation Plan.





## 7. Integrated Monitoring and Reporting (IMR) Component – Annual Work Plan

Budget: \$40 million

**Purpose:** Support the implementation of the Reef 2050 Plan Reef Integrated Monitoring and Reporting Program (RIMReP), including eReefs and the Paddock to Reef monitoring and reporting programs, to improve health monitoring and reporting of the Great Barrier Reef World Heritage Area to ensure that monitoring and reporting to UNESCO is scientifically robust and investment outcomes are measurable.

### Priorities under the Partnership Investment Strategy:

●	Supporting critical monitoring activities identified via RIMReP
●	Catalysing innovation in technology to increase coverage, impact and resource efficiency
●	Driving unity of purpose and adaptive management through developing and implementing a Reef-wide decision-making and forecasting platform
●	Understanding the value of community stewardship and disclosure of high-value information
●	Supporting partnerships and building a community of practice

This knowledge value chain represents the flow of information and data across the sequence of acquisition/processing, management/sharing, scientific interpretation/synthesis and ultimately translation into decisions and response options.

Investments under this Component of the Partnership will help underpin the ultimate goal of resilience-based and adaptive management of the Reef. They will produce significant momentum to introduce innovation in monitoring, new systems with long-term benefits and support critical needs identified through RIMReP. For clarity, monitoring and evaluation of the Partnership is not delivered by this Component, although investments under this Component will provide critical data that will assist with the Partnership monitoring and evaluation.

The results will also serve as an overarching piece of architecture that can accommodate the requirements for better monitoring and reporting in each of the individual Components of the Partnership. As a matter of principle, the Partnership will endeavour to make data and models available to the broader Reef community.

By the end of the Partnership (2024), the IMR Component will contribute to the broader goal of enabling resilience-based and adaptive management of the Reef by delivering two outcomes:

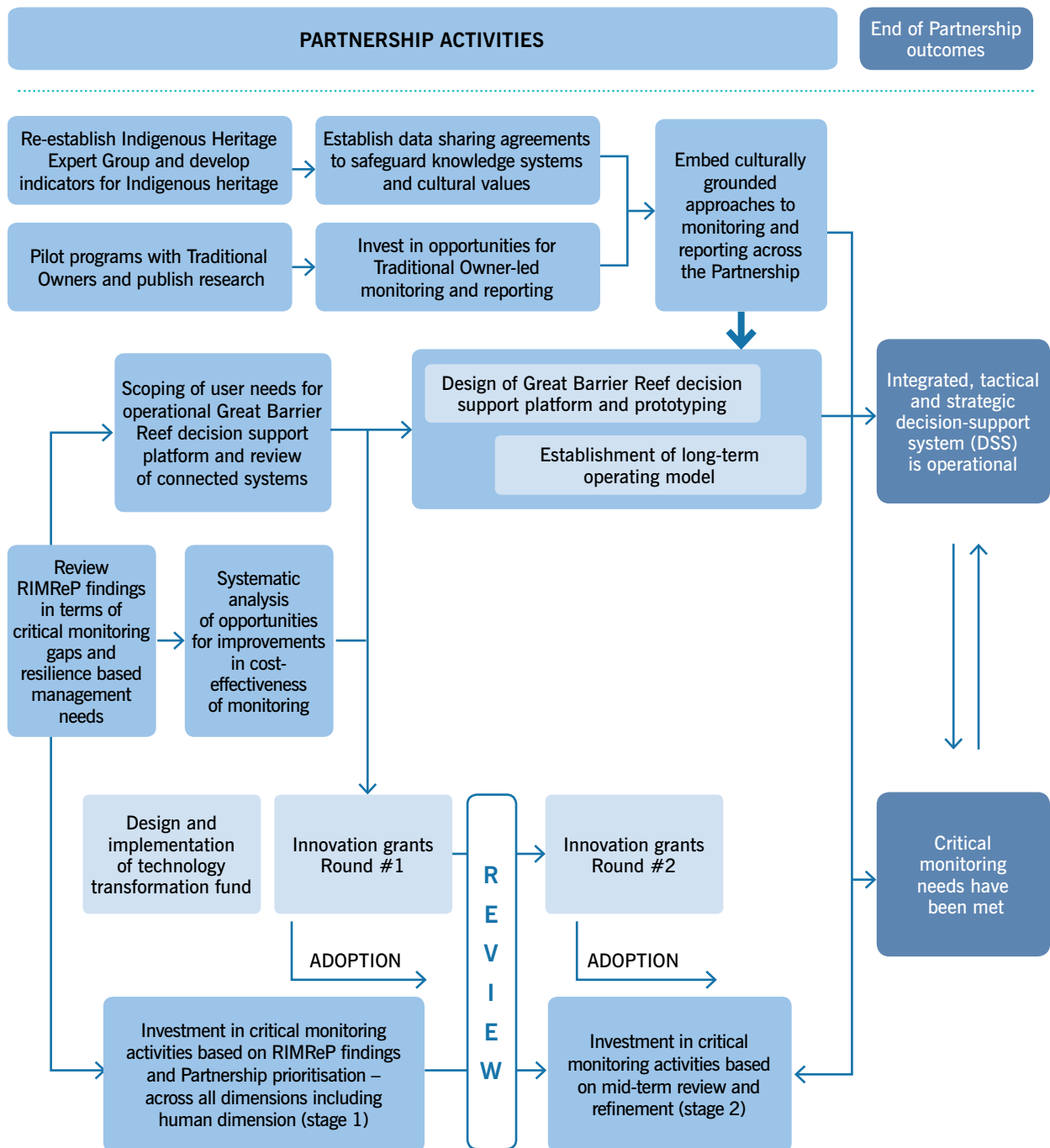
- An integrated, tactical, strategic decision-support system (DSS) is operational (addressing long-term needs),
- Critical RIMReP needs/gaps, prioritised by the Partnership, are being met (addressing short-term needs).

### Overview

Initial steps to transform monitoring and reporting programs began in 2014, when the Australian Government launched RIMReP, a very significant collaborative initiative aiming to establish a step change in the depth, breadth, rigour, coordination and availability of data that managers depend upon in making decisions to benefit the Reef.

In the context of the Partnership, as per the objectives of RIMReP, investment in Integrated Monitoring (including modelling) and Reporting is critical to inform reporting against the Reef 2050 Plan and enable resilience-based and adaptive management of the Reef. For this purpose, our focus will be on contributing towards implementing an effective knowledge value chain, ultimately underpinning best practice decision-making at a whole-of-Reef scale.

Figure 13. IMR Component five-year program overview and end of Partnership outcomes



## Process to develop the Annual Work Plan

As per the purpose stated in the Partnership Grant Agreement, planning for this Component is to be driven by the findings of the first phase of RIMReP. At the time of developing this plan, only preliminary RIMReP findings were available which have been considered in both the program logic and 2019-2020 activities. These may need to be adjusted as final recommendations from RIMReP become available on 30 June 2019 and are reviewed in the first part of financial year 2019-2020.

The innovation element of this Component includes developing an operational decision-support system for the Reef and implementing a Technology Transformation Fund. The quantum of investment in this element was based on both the expected level of effort (in the case of the decision-support system) and the anticipated opportunity for co-investment from the private sector (in the case of the Technology Transformation Fund).

## Five-year plan

Table 16. IMR Component five-year investment areas and budget

Partnership Activity	Why	Outcome	Budget
(existing commitments are shaded)			<b>TOTAL INVESTMENT</b>
			<b>\$40m</b>
● 2018-2019 investment project – Essential coral reef monitoring in the northern Great Barrier Reef	To provide an updated ‘baseline’ assessment of reef condition and recovery in the northern Great Barrier Reef ahead of what was perceived as a significant risk of a potential bleaching event in early 2019.	In-water surveys of coral and fish communities on up to 23 reefs in the northern sector of the Reef.	\$0.57m
● Investment in critical monitoring activities based on RIMReP findings and Partnership prioritisation	A prerequisite to transformational investments is ensuring the foundations are sound, which means adequate baseline monitoring is in place.  The first phase of RIMReP has systematically identified critical monitoring activities needed to support an integrated program. This Partnership funding is expected to make a significant contribution to addressing priority gaps alongside other funding sources.	Progress towards a comprehensive and strategically designed integrated monitoring program for the Reef.  Critical needs have been prioritised and addressed.	\$26m
● Scoping, developing and prototyping an operational Reef decision-support platform	The Reef needs a consistent and transparent approach to decision-making based on data that is current and accurate and on models that enable forecasting and scenario planning.	Integrated, tactical and strategic DSS is operational.	\$4.43m
● Design and implementation of a Technology Transformation Fund supported by industry	Recognising the perpetual need for more monitoring data (more locations, more often), there is a need for investment in transformative technologies that improve the cost-effectiveness of monitoring programs, either by improving existing approaches or developing new strategies to access the required information.  There are also opportunities to increase access to high value data by innovating in the operationalisation of systems, improving scalability and user access. Such systems include models (such as eReefs), data sharing and visualisation platforms and decision-making systems.	New technologies are demonstrated and adopted that improve the cost-effectiveness of a Reef integrated monitoring program.  Industry and research institutions take a collaborative approach to the operationalisation of critical systems underpinning a Reef integrated monitoring program.	\$5m
● Traditional Owner-led integrated monitoring and reporting initiatives (to be defined with Traditional Owner Reef Protection Component)	There is a need to promote positive engagement to protect and maintain culture and heritage values, improve the cycle of research information to management, build or maintain capacity of Traditional Owners and support transition into sunrise industries for increased business enterprise opportunities.  Refer to Table 10. This budget figure is also accounted for in the Traditional Owner Reef Protection Component.	Traditional Owner innovations from Indigenous Knowledge systems inform Strong Peoples-Strong Country Framework and data sharing agreements.  Scoping of readiness and upskilling opportunities for Traditional Owner groups to transition to monitoring activities.	\$4m
<b>TOTAL INVESTMENT</b>			<b>\$40m</b>

## Financial year 2019-2020 work plan

Table 17. IMR Component investment areas and budget for FY2020

Activity	Description	Budget
<b>TOTAL INVESTMENT</b>		<b>\$6.23m</b>
Review of RIMReP recommendations and prioritise critical monitoring needs	<p>The first phase of RIMReP will deliver its findings by 30 June 2019. The Partnership will review key recommendations in relation to critical monitoring gaps (essential monitoring areas that are currently either not funded or only partially funded) and start investing in addressing these gaps.</p> <p>Priority will be placed on addressing gaps in monitoring areas that contribute to the successful delivery of the Partnership, for example including:</p> <ul style="list-style-type: none"> <li>• the development and monitoring (in conjunction with the Traditional Owner Reef Protection Component) of indicators of cultural and heritage values</li> <li>• understanding of processes that support models used to predict water quality in the Reef</li> <li>• improved COTS surveillance and</li> <li>• improved understanding of reef connectivity and impact of coral bleaching.</li> </ul> <p><i>Deliverables: Prioritised list of monitoring activities and procurement of initial activities.</i></p>	\$2m
Scoping user needs for operational Great Barrier Reef decision-support platform and review connected systems	<p>A wide range of models and systems are currently supporting decision-making and policy development for the Reef. These systems, which were designed for specific purposes, will be systematically reviewed and recommendations provided as to how these systems would interact, interface and potentially integrate in an overarching decision-making system.</p> <p>In parallel, the Partnership will lead a comprehensive engagement phase with key users (managers, policy makers, industry, Traditional Owners and the broader community) to identify an agreed set of specifications for a Great Barrier Reef decision-support system which builds on the recommendations of the first phase of RIMReP and supports the implementation of Reef 2050 Plan. Initial design options will be developed for further consultation.</p> <p><i>Deliverables: Review of existing decision support systems. Recommendations and initial design options for a Great Barrier Reef decision support platform.</i></p>	\$0.43m
Prioritising innovation needs, establishing a Technology Transformation Fund and first round of technology transformation grants	<p>In conjunction with the review of RIMReP recommendations and identification of critical monitoring gaps, the Partnership will systematically review areas which would benefit most from a step change or transformation and engage with industry to set up a transformation fund targeting these specific areas.</p> <p>A first round of grants will be delivered, the magnitude of which will depend on industry interest and leveraging. It is anticipated that \$5 million will be invested over the term of the Partnership, leveraged with an additional \$5 million contribution from non-government funds.</p> <p><i>Deliverables: Prioritised list of opportunities and first round of funding for pilot programs.</i></p>	\$2m
Traditional Owner-led IMR Reef protection initiatives Prioritise, plan and design Traditional Owner-led IMR activities	<p>Traditional Owner knowledge forms a critical part of building a holistic understanding on the condition and trend of Reef values. This component will continue to support the finalisation and implementation of the Strong Peoples-Strong Country Framework developed through RIMReP by the Reef Traditional Owner Indigenous Heritage Expert Group (with project management provided by CSIRO). Implementation will include developing a broader set of Traditional Owner identified objective indicators that can be used to monitor the condition and status of Indigenous heritage; as well as resourcing made available for Traditional Owner groups to negotiate data sharing agreements as part of a pilot program for the Framework.</p> <p>Refer to Table 11. This budget figure is also accounted for in the Traditional Owner Reef Protection Component.</p>	\$1.8m
<b>TOTAL INVESTMENT</b>		<b>\$6.23m</b>



Table 18. IMR Component Gantt chart for FY2019–2020

Activities	Description	Budget	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
<b>Review of RIMReP recommendations and prioritisation of critical monitoring needs</b>			\$2m											
Review of RIMReP findings	Detailed review of RIMREP findings and mapping of critical gaps.		█											
Prioritisation process	Engagement with GBRMPA, Australian and Queensland Governments to develop prioritised list of monitoring needs.			█										
Scoping and procurement	Selection of delivery model and procurement.								█					
<b>Scoping of user needs for operational Reef decision support platform and review of connected systems</b>			\$0.43m											
Review of existing systems	Consultancy delivering review of current decision support systems, models and data sharing platforms.		Scoping		Delivery									
Broad end user engagement	Engagement and development of agreed purpose and specifications for operational decision support platform.				█									
Design options	Development of design options for consultation and recommendation on preferred option to be further investigated.										█			
<b>Prioritisation of innovation needs and establishment of technology transformation fund</b>			\$2m											
Identification of innovation focus areas	Linked to RIMReP review, identification and prioritisation of areas where technology transformation will have greatest impact.			█										
First innovation round of grants	Scoping, launch, selection and awarding of first round of technology innovation grants.							Call for proposals		Selection	Contracting and inception			
<b>Traditional Owner-led IMR initiatives</b>			\$1.8m											
Governance	Re-establish Indigenous Heritage Expert Group, develop cultural guidelines and data sharing principles.		█											
Indicators	Develop indicators for Indigenous heritage including Traditional Owners.					█								
Audit	Audit to map current Traditional Owner programs, work, skills and interest.							█						
Options development	Map and invest in opportunity pathways to transition to Traditional Owner-led programs through a co-design process.									█				

## Appendix 1.

# Alignment of Annual Work Plan with Reef 2050 Plan (July 2018) and Reef Trust Outcomes

### 1.1 Water Quality Component contributions to Reef 2050 Plan Outcomes, Objectives, Targets and Actions

Water quality activities directly contribute to the delivery of actions, targets, objectives and outcomes under the Reef 2050 Plan Water Quality (WQ) theme.

The following table outlines how Water Quality Component activities and outcomes, as outlined in the Annual Work Plan, align with and contribute to achievement of Reef 2050 Water Quality targets and actions. In turn, these actions and targets collectively contribute to:

- *Reef 2050 Plan Water Quality outcome: Good water quality sustains the Outstanding Universal Value, builds resilience, improves ecosystem health and benefits communities*
- *Reef 2050 Plan Water Quality objective: Over successive decades the quality of water entering the Reef from broadscale land use has no detrimental impact on the health and resilience of the Great Barrier Reef*

It is important to note that the Reef 2050 Plan Water Quality theme directly links to the Reef 2050 Water Quality Improvement Plan (WQIP) 2017-2021. Hence the Reef 2050 Plan targets and actions outlined below are drawn directly from the Reef 2050 WQIP. Water quality, land and catchment management targets and the human dimension target are outlined in Figure 4 of the Reef 2050 WQIP. Numbers in brackets refer to actions in the Reef 2050 WQIP (refer Implementation Tables A1-A3 and B1-B4).

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
2018-2019 year investment activities.	A need was identified to address existing delivery capacity constraints for on-ground activities, as well as mitigate the risk of losing current extension and delivery staff during the program development phase. The need for catchment-level modelling of the cost and effectiveness of on-ground actions was an essential element of investment planning.	Maintain/build on-ground capacity across moderate, high and very high priority catchments to support program implementation, while also reducing pollutant run-off. Alluvium report on investment pathways and online interface for development and assessment of investment scenarios.	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan targets</b> to reduce anthropogenic end-of-catchment dissolved inorganic nitrogen loads, fine sediment loads, particulate nutrient loads and to achieving the pesticide target.</li> <li>• Directly contributes to <b>Reef 2050 WQIP</b> water quality, land and catchment management targets and human dimension targets.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Water Quality action MTR* WQA1 to implement the Reef 2050 WQIP</b>, in particular actions for catchment restoration (A3), building a culture of innovation and stewardship (A2), and enabling delivery of targets through applying the best available science and knowledge (B1), coordinating and prioritising investment (B2), governance to support coordinated decision making and accountability (B3) and evaluation performance (B4).</li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Regionally-focussed on-ground actions.</p>	<p>Limited funding relative to the total cost of achieving the WQIP objectives requires a strategic and targeted approach to addressing the highest priority pollutants in the highest priority catchments.</p> <p>There is now significant experience in implementing water quality improvement activities, although a more targeted approach is required that adopts the most cost-effective actions, improves upon them, and extends adoption.</p>	<p>Reduce DIN runoff in Wet Tropics (Johnstone, Tully, Mulgrave Russell, Herbert), Burdekin (Lower Burdekin/ Haughton), and Mackay-Whitsunday (Plane Creek) regions, primarily via practice change related to fertiliser and irrigation management in the sugarcane industry.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to the <b>Reef 2050 Plan Water Quality target</b> to reduce anthropogenic end-of-catchment dissolved inorganic nitrogen loads by 60%.</li> <li>• Directly contributes to <b>Reef 2050 Plan (WQIP) land and catchment management target</b> of 90% of land in priority areas under grazing, horticulture, bananas, sugarcane and other broad-acre cropping are using best management practice systems for water quality outcomes (soil, nutrient and pesticides).</li> <li>• Also supports <b>Reef 2050 Plan Governance targets</b>: Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience (GT4), and actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the Reef (GT3).</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 WQIP actions for catchment restoration</b> (A3) and a culture of innovation and stewardship (A2). Implementation also contributes to actions for applying the best available science and knowledge (B1) coordinating and prioritising investment (B2); governance to support coordinated decision making and accountability (B3); and evaluating effectiveness (B4).</li> </ul>
	<p>Investments in specific catchments have been determined by a detailed technical assessment, supported by a decision-making process that considered a range of value drivers and objectives.</p>	<p>Reduce anthropogenic FSS runoff from the Burdekin (Bowen Bogie, Upper and East Burdekin), Wet Tropics (Herbert River), Fitzroy (Lower Fitzroy and Mackenzie), and Burnett Mary (Mary River) regions, including through restoration of the landscape (gullies and streambanks) and improved management of grazing lands.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Water Quality target</b> to reduce anthropogenic end-of catchment fine sediment loads by 25%. Also contributes to Reef 2050 Plan target to reduce anthropogenic end-of-catchment particulate nutrient loads by 20%.</li> <li>• Directly contributes to <b>Reef 2050 Plan (WQIP) land and catchment management target</b> of 90% of land in priority areas under grazing, horticulture, bananas, sugarcane and other broad-acre cropping are using best management practice systems for water quality outcomes (soil, nutrient and pesticides).</li> <li>• Directly contributes to land and catchment management target of 90% of grazing lands will have greater than 70% ground cover in the late dry season.</li> <li>• Also supports <b>Reef 2050 Plan Governance targets</b>: Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience (GT4), and Actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the Reef (GT3).</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 WQIP actions for catchment restoration</b> (A3) and a culture of innovation and stewardship (A2). Implementation also contributes to actions for applying the best available science and knowledge (B1); coordinating and prioritising investment (B2); governance to support coordinated decision making and accountability (B3); and evaluating effectiveness (B4).</li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
Regionally-focussed on-ground actions.		Reduce pesticide runoff in Burdekin (Lower Burdekin/ Haughton), and Mackay-Whitsunday (Plane Creek and Pioneer River) regions, including through practice change, particularly in the sugarcane industry.	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Water Quality pesticide target</b> to protect at least 99% of aquatic species at the end-of catchments.</li> <li>• Directly contributes to <b>Reef 2050 Plan (WQIP) land and catchment management target</b> of 90% of land in priority areas under grazing, horticulture, bananas, sugarcane and other broad-acre cropping are using best management practice systems for water quality outcomes (soil, nutrient and pesticides).</li> <li>• Also supports <b>Reef 2050 Plan Governance targets</b>: Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience (GT4), and actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the Reef (GT3).</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 WQIP actions for catchment restoration</b> (A3) and a culture of innovation and stewardship (A2). Implementation also contributes to actions for applying the best available science and knowledge (B1); coordinating and prioritising investment (B2); governance to support coordinated decision making and accountability (B3); and evaluating effectiveness (B4).</li> </ul>
Conservation and protection of less disturbed catchments.	This mitigates the risk of degradation of less disturbed catchments and relies on the expectation that prevention and early intervention are more cost-effective than repair.	Avoided degradation of the quality of water entering the Reef, particularly from less-disturbed catchments, and contribution to land stewardship objectives.	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan (WQIP) land and catchment management targets</b> to increase the extent of riparian vegetation and no loss of the extent of natural wetlands.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 WQIP actions for a culture of innovation and stewardship</b> (A2) and catchment restoration (A3). Implementation also aligns with and contributes to actions for applying the best available science and knowledge (B1); coordinating and prioritising investment (B2); governance to support coordinated decision making and accountability (B3); and evaluating effectiveness (B4).</li> </ul>
Traditional Owner-led Reef protection initiatives.	Protect and maintain culture and heritage values for water sources (including cultural flows).  Diversification of skillsets/capacity building – improved inclusion.	Direct investment in Traditional Owner Country based planning and management for improved WQ outcomes; improved capacity and opportunity for Traditional Owner enterprises to become engaged in WQ programs; cultural value recognised in protection and improvement efforts.	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to the <b>Reef 2050 (WQIP) human dimension target</b> to increase active engagement of communities and land managers in programs to improve water quality outcomes.</li> <li>• Also contributes to <b>Reef 2050 Plan Community Benefit target</b> (CBT3): community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 WQIP actions for a culture of innovation and stewardship</b> (A2) and catchment restoration (A3). Implementation also aligns with and contributes to actions for applying the best available science and knowledge (B1); coordinating and prioritising investment (B2); governance to support coordinated decision making and accountability (B3); and evaluating effectiveness (B4).</li> </ul> <p>Also see section 1.4 Traditional Owner Reef Protection Component.</p>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
Innovation and System Change.	There is a need for a transformational change in how WQ improvement activities are designed, funded, and implemented to support enduring and self-sustaining improvements at sufficient scale.	New systems, technologies, and financing options available to support WQ improvement activities and achieve enduring impact.	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>Directly contributes to <b>Reef 2050 (WQIP) water quality, land and catchment management targets and the human dimension target.</b></li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Directly contributes to <b>Reef 2050 WQIP actions</b> for a culture of innovation and stewardship (A2) and catchment restoration (A3). Implementation also aligns with and contributes to actions for applying the best available science and knowledge (B1); coordinating and prioritising investment (B2); governance to support coordinated decision making and accountability (B3); and evaluating effectiveness (B4).</li> </ul>

## 1.2 Crown-of-Thorns Starfish Control Component contributions to Reef 2050 Plan Outcomes, Objectives, Targets and Actions

Crown-of-thorns starfish control activities directly contribute to the delivery of actions, targets, objectives and outcomes under the Reef 2050 Plan Ecosystem Health (EH) theme.

The following table outlines how Crown-of-Thorns Starfish Control Component activities and outcomes, as outlined in the Annual Work Plan, align with and contribute to achievement

of Reef 2050 targets and actions. In turn, these actions and targets collectively contribute to:

- *Reef 2050 Plan Ecosystem Health outcome: The status and ecological functions of ecosystems with the Great Barrier Reef World Heritage Area are in at least good condition with a stable to improving trend.*

- *Reef 2050 Plan Ecosystem Health objective: Trends in the condition of key ecosystems including coral reefs, seagrass meadows, estuaries, islands, shoals and inter-reefal areas are improved over each successive decade.*

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
Manual in-water COTS control to be maintained at a level consistent with scientific advice and intensity of the current outbreak.	Until such time as new large scale control methods become available, manual in-water control of COTS remains the only practical option available to Reef managers to reduce COTS densities and protect coral cover at high ecological and economic value sites.	Reduced COTS mortality from current COTS outbreaks at high ecological and economic value coral reefs.	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>Directly contributes to the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> <li>Also supports <b>Reef 2050 Plan Governance targets</b>: Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience (GT4); and actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the Reef (GT3).</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Directly contributes to <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Collaborative feasibility study to assess opportunities for innovations in COTS management.</p>	<p>There has been limited funding for activities focusing on innovations in COTS control and these activities have been disjointed. Recent NESP investments, through the Reef &amp; Rainforest Research Centre (RRRC), have led to significant progress in this area with the development of an integrated pest management strategy.</p> <p>Targeted investment is needed for a collaborative feasibility study involving key scientific agencies to systematically investigate the potential of new COTS control options, and to prioritise future investment in R&amp;D and enabling social and regulatory areas.</p>	<p>Recommendations on priority innovation areas in COTS management with the goal of an enhanced ability to predict and detect primary outbreaks and more effectively control the spread and impact of these outbreaks</p>	<p><b>Target</b></p> <ul style="list-style-type: none"> <li>An enabling activity creating the conditions to more effectively detect and control COTS and its outcome contributing to the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> </ul> <p><b>Action</b></p> <ul style="list-style-type: none"> <li>An enabling activity designed to support on-ground delivery and forms a key part of <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> <li>Contributes to <b>Reef 2050 Plan Governance Action</b> (MTR* GA4): Develop and implement a Reef Integrated Monitoring and Reporting Program, specifically: <ul style="list-style-type: none"> <li>enabling timely and suitable responses by Reef managers and partners to emerging issues and risks.</li> </ul> </li> </ul>
<p>Implementation of feasibility study recommendations into innovations in COTS management.</p>	<p>Future outbreaks on the Reef are almost certain and the immediate need to control secondary outbreaks using manual in-water control needs to be balanced with the identification and suppression of future primary outbreaks and innovative methods and technologies that can complement existing manual in-water control.</p> <p>Targeted investment in transformational innovations, based on outcomes of the feasibility study, can provide a pathway towards a step change in COTS control.</p>	<p>R&amp;D, testing and implementation of new methods including in early warning systems, early intervention options, alternative control technologies, and improved prediction and decision-making.</p> <p>Innovative methods and technologies that can complement existing manual in-water control are ready for implementation.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>Directly contributes to the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Directly contributes to <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> <li>Contributes to <b>Reef 2050 Plan Governance Action</b> (MTR* GA4): Develop and implement a Reef Integrated Monitoring and Reporting Program, specifically: <ul style="list-style-type: none"> <li>facilitates adaptive management for the Reef that is effective, efficient and evolving</li> <li>enabling timely and suitable responses by Reef managers and partners to emerging issues and risks.</li> </ul> </li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Independent scientific reviews of COTS control program effectiveness.</p>	<p>The need for an independent review of COTS control was highlighted during Partnership consultations (including with the Reef 2050 Independent Expert Panel).</p> <p>The COTS control program is continuously evolving, and its effectiveness will benefit from regular independent reviews (2020 and 2024).</p>	<p>Recommendations for improvements to monitoring and control activities, and to facilitate future planning and investments in COTS control.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>This activity ensures the best available science and knowledge provides the basis for improved on-ground delivery of actions and contributes to the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>This activity ensures on-ground actions are informed by the best available science and knowledge and forms a key part of part of <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> </ul>
<p>COTS forums to identify gaps and opportunities in innovation and contribute to Partnership progress.</p>	<p>There is a recognised need by stakeholders for regular forums dedicated to COTS research and management in 2020 and 2024, focused on identifying innovation priorities and to address the long-term challenge of COTS control.</p>	<p>Enabling cross-sector dialogue and supporting long-term planning of innovation in COTS management.</p>	<p><b>Target</b></p> <ul style="list-style-type: none"> <li>An enabling activity creating the conditions to more effectively detect and control COTS and its outcome contributing to the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> </ul> <p><b>Action</b></p> <ul style="list-style-type: none"> <li>An enabling activity designed to support on-ground delivery and forms a key part of <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> </ul>
<p>Long-term funding strategy for COTS control.</p>	<p>Effective action on COTS predation will be one of the strongest levers to protect coral cover in the coming decades therefore a long-term approach to sustained funding is imperative.</p>	<p>A funding strategy that presents a comprehensive business case and real options to support planning and policy development for long-term funding of COTS management.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>An enabling activity designed to secure long-term funding for COTS control. This contributes directly to the achievement of the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>An enabling activity designed to support the on-ground delivery of actions across geographic areas and timeframes commensurate with the scale of the challenge and forms a key part of <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Community driven activities for expanded involvement in COTS control.</p>	<p>Through stakeholder consultation and the Community Reef Protection Component, the role of community and citizen science to engage more widely in COTS control has been identified as an opportunity to expand partner delivery capacity.</p>	<p>Identification of opportunities to support community and citizen science participation in COTS control and implementation of pilot community programs.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>This activity is designed to strengthen partnerships and pool resources contributing to the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> <li>Contributes to <b>Reef 2050 Plan Community Benefit target</b> (CBT3): community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Supports and expands the on-ground delivery of actions forming a key part of <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> <li>Directly contributes to <b>Reef 2050 Plan Community Benefit Action</b> (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by: <ul style="list-style-type: none"> <li>empowering partners to be part of actions to build Reef resilience.</li> </ul> </li> <li>Contributes to <b>Reef 2050 Plan Ecosystem health action</b> (MTR EHA4): Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint, specifically fostering partnerships for action and innovation (ramping up COTS control)</li> </ul>
<p>Traditional Owner activities (to be defined under Traditional Owner Reef Protection Component).</p>	<p>There is a need to promote positive engagement to protect and maintain culture and heritage values and to support the transition into sunrise industries for increased business enterprise opportunities, alongside the diversification of skillsets and capacity building.</p>	<p>Scoping of business ready Traditional Owner groups to transition to manual in-water control activities.</p> <p>Identification and delivery of training to upskill Traditional Owners and funding of viable groups directly to enable contributions to manual in-water control activities.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>Contributes to the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> <li>Contributes to <b>Reef 2050 Plan Economic Benefit targets</b> (EBT1): There is an increase in the number of Traditional Owner service providers and viable businesses: and (EBT2); the number of employment opportunities for Traditional Owners in sea country management and Reef-based industries is increased.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Supports and expands the on-ground delivery of actions forming a key part of <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> <li>Contributes to <b>Reef 2050 Plan Economic Benefits action</b> (EBA2): Assist Traditional Owners to be business-ready and have improved capacity to generate economic benefits from use and management of their traditional estates.</li> </ul> <p>Also see section 1.4 Traditional Owner Reef Protection Component.</p>

\*MTR refers to Reef 2050 Mid-Term Review Action



### 1.3 Reef Restoration and Adaptation Science Component contributions to Reef 2050 Plan Outcomes, Objectives, Targets and Actions

Reef Restoration and Adaptation Science (RRAS) activities directly contribute to the delivery of actions and targets under the Reef 2050 Plan Ecosystem Health (EH) and Biodiversity (B) themes.

The following table outlines how RRAS Component activities and outcomes, as outlined in the Annual Work Plan, align with and contribute to achievement of Reef 2050 targets and actions. In turn, these actions and targets collectively contribute to:

**Reef 2050 Plan outcomes:**

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

**Reef 2050 Plan objective:**

- *Ecosystem Health: The Great Barrier Reef World Heritage Area retains its integrity and systems functions*

*by maintaining and restoring the connectivity, resilience and condition of marine and coastal ecosystems (EH02)*

- *Ecosystem Health: Trends in the condition of key ecosystems including coral reefs, seagrass meadows, estuaries, islands, shoals and inter-reefal areas are improved over each successive decade (EH03).*

*Biodiversity: Reef habitats and ecosystems are managed to sustain healthy and diverse populations of indicator species across their natural range (BO5).*

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
Traditional Owner and stakeholder engagement: The program will adopt scientifically supported engagement processes. This activity will see additional co-investment through coordination with the Community Reef Protection Component.	Social consensus is the basis of social licence to operate. A driver of perceived benefit and risk and by extension, it impacts permitting and regulatory systems. It is essential to match the chosen strategy to program needs/purpose and community/ stakeholder expectations.	Social licence to operate. A more engaged and actively participating Reef community	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• An enabling activity creating the conditions necessary for Reef restoration activities to proceed and facilitating opportunities for participation and collaborations contributing to <b>Reef 2050 Plan Ecosystem Health target (EHT5):</b> Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target (BT2):</b> Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> <li>• Also contributes to <b>Reef 2050 Plan Community Benefit target (CBT3):</b> Community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR* EHA3):</b> Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint – specifically: facilitating opportunities for community and industry participation in local-scale restoration; and researching and developing large scale restoration methods.</li> <li>• Contributes to <b>Reef 2050 Plan Ecosystem health action (MTR EHA4):</b> Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint, including focusing collaborative efforts on delivery of resilience-based across the resilience network.</li> <li>• Contributes to <b>Reef 2050 Plan Community Benefit Action (MTR* CBA1):</b> Strengthen community efforts to address climate change impacts on the Reef by: <ul style="list-style-type: none"> <li>– empowering partners to be part of actions to build Reef resilience.</li> </ul> </li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Regulatory activities: Develop a robust and enabling regulatory environment for reef restoration and adaptation and regulatory system capacity to assess risks and impacts.</p>	<p>Interventions within the Great Barrier Reef World Heritage Area may involve a range of state, federal and international regulatory requirements depending on location and nature of the intervention.</p>	<p>A more fit for purpose regulatory and policy environment for restoration and adaptation interventions and research.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>An enabling activity creating the regulatory environment necessary for Reef restoration and adaptation activities to proceed appropriately and setting the foundations for this Component's contributions to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target</b> (BT2): Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>An enabling activity designed to set the foundation and support the delivery of the following <b>Reef 2050 Plan Ecosystem Health actions</b>: to investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint (MTR* EHA3); to develop technologies to facilitate recovery of degraded reefs and to build increased resilience under forward climate scenarios including assessing the feasibility of increasing the thermal tolerance of Great Barrier Reef corals (MTR* EHA11); and to determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint (MTR EHA4).</li> </ul>
<p>Modelling and decision support systems: Applying next generation reef models to underpin feasibility testing and investment decisions, including activities dedicated to conducting ecological process studies to fill knowledge gaps regarding drivers of stress and adaptation.</p>	<p>Defensible decision-making requires integrating information from multiple sub-projects (and disciplines) using a common structure and language.</p>	<p>Robust integrated models underpinning the prioritisation of investments in intervention and deployment strategies, based on the best possible ecosystem process data.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>An enabling activity ensuring activities are informed by the best available science and investment is directed to effective deliver methods which contribute to: <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target</b> (BT2): Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> <li>Also supports <b>Reef 2050 Plan Governance targets</b>: Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience (GT4); and actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the Reef (GT3).</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>An enabling activity designed to establish the framework for the delivery of the following <b>Reef 2050 Plan Ecosystem Health actions</b>: to investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint (MTR* EHA3); to develop technologies to facilitate recovery of degraded reefs and to build increased resilience under forward climate scenarios including assessing the feasibility of increasing the thermal tolerance of Great Barrier Reef corals (MTR* EHA11); and to determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint (MTR* EHA4).</li> <li>Will also contribute to <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA16): Undertake further research to gain a deeper understanding of climate change trajectories for the Reef and communities that depend on it.</li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Aquaculture based program areas including cryopreservation: R&amp;D focusing on propagation optimisation, brood stock creation, improving methods for deployment and treatments to support resilience, fitness and survival of coral.</p>	<p>At present, there are no restoration or adaptation techniques that work, or are cost effective at the scale required to ensure survival of coral reefs. This activity will be the world's largest effort to overcome this challenge.</p>	<p>A suite of intervention techniques that can feasibly protect or restore coral reefs</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health target (EHT5)</b>: Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target (BT2)</b>: Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR EHA11)</b>: Develop technologies to facilitate recovery of degraded reefs and to build increased resilience under forward climate scenarios including assessing the feasibility of increasing the thermal tolerance of Great Barrier Reef corals.</li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR* EHA3)</b>: Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint, specifically: testing, improving and scaling up local-scale reef restoration methods – based on the best available science – for potential application across the resilience network; and researching and developing large scale restoration methods.</li> <li>• Contributes to <b>Reef 2050 Plan Ecosystem health action (MTR EHA4)</b>: Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint.</li> </ul>
<p>Moving corals and rubble stabilisation: A field-based effort to transfer brood stock and larvae. It will include efforts to improve recruitment on to reefs following disturbances (rubble stabilisation/algae removal).</p>	<p>As the Reef remains diverse and reproductively healthy, there is scope to improve methods that capture this diversity. Improving settlement and post-settlement survival in the wild will also benefit the out-planting component of the aquaculture-based programs.</p>	<p>Methods to increase natural recruitment, or to facilitate mass migration will be made available to restore degraded reefs.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health target (EHT5)</b>: Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and Reef 2050 Plan Biodiversity target (BT2): Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR EHA11)</b>: Develop technologies to facilitate recovery of degraded reefs and to build increased resilience under forward climate scenarios including assessing the feasibility of increasing the thermal tolerance of Great Barrier Reef corals.</li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR* EHA3)</b>: Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint, specifically: testing, improving and scaling up local-scale reef restoration methods – based on the best available science – for potential application across the resilience network; and researching and developing large scale restoration methods.</li> <li>• Contributes to <b>Reef 2050 Plan Ecosystem health action (MTR EHA4)</b>: Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint.</li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Solar radiation management: A strong initial investment to investigate the feasibility of this will direct any further investments, which will likely require substantial additional investments outside the scope of the Partnership.</p>	<p>Preliminary modelling indicates that the best option for Reef-wide protection lies in large scale solar radiation management. The feasibility of this approach will depend on correlations between solar radiation and heat impacts of non-lethal bleaching in the adaptation process and detection of unintended ecosystem impacts.</p>	<p>A possible large-scale intervention method focused on prevention of loss during coral bleaching conditions</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>This activity examines the feasibility of a possible large scale intervention method which if successful would contribute to <b>Reef 2050 Plan Ecosystem Health target (EHT5)</b>: Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target (BT2)</b>: Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Directly contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR EHA11)</b>: Develop technologies to facilitate recovery of degraded reefs and to build increased resilience under forward climate scenarios including assessing the feasibility of increasing the thermal tolerance of Great Barrier Reef corals.</li> <li>Directly contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR* EHA3)</b>: Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint, specifically: testing, improving and scaling up local-scale reef restoration methods – based on the best available science – for potential application across the resilience network; and researching and developing large scale restoration methods.</li> <li>Contributes to <b>Reef 2050 Plan Ecosystem health action (MTR EHA4)</b>: Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint.</li> </ul>
<p>Systems engineering and integrated logistics: This sub-activity will focus on identifying and utilising synergies between engineering needs of the R&amp;D components.</p>	<p>To ensure cost-benefits and to progress multi- intervention deployment engineering challenges.</p>	<p>Interventions are assessed against deployment logistics and cost savings are made through coordination of activities.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>This activity enhances the potential for interventions to contribute to <b>Reef 2050 Plan Ecosystem Health target (EHT5)</b>: Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target (BT2)</b>: Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Directly contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR EHA11)</b>: Develop technologies to facilitate recovery of degraded reefs and to build increased resilience under forward climate scenarios including assessing the feasibility of increasing the thermal tolerance of Great Barrier Reef corals.</li> <li>Directly contributes to <b>Reef 2050 Plan Ecosystem Health action (MTR* EHA3)</b>: Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint, specifically: testing, improving and scaling up local-scale reef restoration methods – based on the best available science – for potential application across the resilience network; and researching and developing large scale restoration methods.</li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Automation: Activities to develop automation and mass production technologies to overcome the cost and scale challenges in delivering intervention technology.</p>	<p>Delivering any interventions at the scales required to have an impact at large scales will require automation, robotics and autonomous systems to be developed.</p>	<p>Intervention production and deployment processes to be done at required scales and within reasonable budgets.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>This activity enhances the potential for interventions to contribute to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target</b> (BT2): Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Directly contributes to <b>Reef 2050 Plan Ecosystem Health action</b> (MTR EHA11): Develop technologies to facilitate recovery of degraded reefs and to build increased resilience under forward climate scenarios including assessing the feasibility of increasing the thermal tolerance of Great Barrier Reef corals.</li> <li>Directly contributes to <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA3): Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint, specifically: testing, improving and scaling up local-scale reef restoration methods – based on the best available science – for potential application across the resilience network; and researching and developing large scale restoration methods.</li> </ul>
<p>Program management and logistics: Program coordination and management, including international engagement activities and early phase assessments of emerging technology and interventions.</p>	<p>Program coordination is crucial for the success of a program of this size.</p>	<p>Program delivers outcomes in timely and cost-efficient manner.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>This foundational activity underpins the program’s capacity to contribute to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and Reef 2050 Plan Biodiversity target (BT2): Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>This foundational activity supports the delivery of the following <b>Reef 2050 Plan Ecosystem Health actions</b>: to investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint (MTR* EHA3); to develop technologies to facilitate recovery of degraded reefs and to build increased resilience under forward climate scenarios including assessing the feasibility of increasing the thermal tolerance of Great Barrier Reef corals (MTR* EHA11); and to determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint (MTR* EHA4).</li> </ul>

Partnership Activity	Rationale	Partnership Outcome	Reef 2050 Targets and Actions
<p>Traditional Owner-led Reef protection initiatives (to be defined with Traditional Owner Reef Protection Component).</p>	<p>There is a need to promote positive engagement to protect and maintain culture and heritage values and to support the transition into sunrise industries for increased business enterprise opportunities, alongside the diversification of skillsets and capacity building.</p>	<p>Scoping of readiness and upskilling opportunities for Traditional Owner groups to transition to reef restoration activities.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Contributes to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target</b> (BT2): Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> <li>• Contributes to <b>Reef 2050 Plan Heritage target</b> (HT1): New and effective cooperative management practices are developed for protection and conservation of Great Barrier Reef Indigenous and non-Indigenous heritage.</li> <li>• Contributes to <b>Reef 2050 Plan Economic Benefit targets</b> (EBT1): There is an increase in the number of Traditional Owner service providers and viable businesses; and (EBT2): the number of employment opportunities for Traditional Owners in sea country management and Reef-based industries is increased.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Contributes to <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA3): Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint.</li> <li>• Contributes to <b>Reef 2050 Plan Economic Benefits action</b> (EBA2): Assist Traditional Owners to be business-ready and have improved capacity to generate economic benefits from use and management of their traditional estates.</li> </ul> <p>Also see section 1.4 Traditional Owner Reef Protection Component.</p>

\*MTR refers to Reef 2050 Mid-Term Review Action

## 1.4 Traditional Owner Reef Protection Component contributions to Reef 2050 Plan Outcomes, Objectives, Targets and Actions

Traditional Owner Reef Protection activities directly contribute to the delivery of actions and targets under the Reef 2050 Plan Ecosystem Health (EH), Biodiversity (B), Heritage (H), Water Quality (WQ), Community Benefits (CB), Economic Benefits and Governance themes.

The following table outlines how Traditional Owner Reef Protection Component activities and outcomes, as outlined in the Annual Work Plan, align with and contribute to achievement of Reef 2050 targets and actions. In turn, these actions and targets collectively contribute to:

**Reef 2050 Plan Community Benefit outcome:**

*An informed community that plays a role in protecting the Reef for the benefits a healthy Reef provides for current and future generations.*

**Reef 2050 Plan objectives:**

- **Ecosystem Health:** the knowledge, innovations and practices of Traditional Owners relevant for conservation and cultural use of biocultural diversity are preserved and maintained (EH01).
- **Biodiversity:** Traditional Owners are engaged and participate in and manage the conservation and ecologically sustainable use of cultural keystone species and biocultural resources (B01).
- **Heritage:** Traditional Owners’ cultural heritage rights and responsibilities are incorporated in all facets of management (HO1).
- **Heritage:** Indigenous and non-Indigenous heritage including natural, aesthetic, historic, scientific, and social values are identified, conserved and managed in partnership with the community (HO2).
- **Community benefits provided by the Reef, including its superlative natural beauty and the sense of place, are maintained for current and future generations (CBO3).**
- **Community Benefits:** Local, regional and Reef-wide community benefits are understood and the community is actively engaged in managing Reef activities (CBO4).
- **Economic Benefits:** Reef-dependent industries are productive and profitable based on a healthy Reef and are ecologically sustainable (EBO4).
- **Governance:** Strong partnerships with Traditional Owners, industry, researchers and the community support protection and management of the Reef (GO3).

RTP Component	Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
Traditional Owner and Community Reef Protection. <i>Cross-cutting program activity</i>	Formalise governance arrangements for the Traditional Owner Reef Protection Component and cross-components. Strategic communication and engagement. Co-design (co-benefits) Action Framework.	The Partnership is committed to a process of co-design and co-delivery with Traditional Owners of the Reef. Traditional Owner engagement in the Partnership aims to strengthen active participation and decision making. Co-designed programs and projects aim to deliver improvements to equitable outcomes and to maximise co-benefits.	Traditional Owner participation in governance arrangements for protection and management of the Reef is improved. Benefits to Traditional Owners engaged in sea country management improve. Collaborative working arrangements with Traditional Owners which establish mutual trust and build capacity are developed.	<b>Targets</b> <ul style="list-style-type: none"> <li>• An enabling activity for <b>Reef 2050 Plan Ecosystem Health target (EHT2)</b>: The number of agreements with Traditional Owners addressing management of ecosystems within their traditional estates is increased.</li> <li>• Directly contributes to <b>Reef 2050 Plan Heritage target (HT3)</b>: Partnerships between Traditional Owners and all stakeholders are increased to ensure key Reef heritage values are identified, documented, and monitored; and (HT1): New and effective cooperative management practices are developed for protection and conservation of Great Barrier Reef Indigenous and non-Indigenous heritage.</li> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit target (CBT3)</b>: Community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul>

RTP Component	Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
<p>Traditional Owner and Community Reef Protection.</p> <p><i>Cross-cutting program activity</i></p>				<p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• An enabling activity for <b>Reef 2050 Plan Ecosystem Health actions</b>: EHA2: Incorporate and prioritise Traditional Owners' planning into existing future ecosystem policy and programs; EHA3: Support Traditional Owner stewardship activities that contribute to Reef health and resilience, including removing and, where possible, identifying the sources of marine debris; EHA4: Develop further agreements with Traditional Owners addressing management of ecosystems within their traditional estates; and (MTR EHA4): Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint; specifically, actions to foster partnerships for action and innovation and building awareness and support.</li> <li>• An enabling activity for <b>Reef 2050 Plan Biodiversity action</b> (BA3): Improve Traditional Owner engagement to strengthen participation in decision making at all levels relating to the conservation and cultural use of biodiversity.</li> <li>• An enabling activity for <b>Reef 2050 Plan Heritage action</b> (HA1): Build capacity for the involvement of Traditional Owners and community members in cooperative management, planning and impact assessment.</li> <li>• An enabling activity for <b>Reef 2050 Plan Community Benefit actions</b>: CBA2: Work with Traditional Owners to identify world's best practice in agreement making, strategic planning, and management and implementation of Indigenous programs in relation to Great Barrier Reef sea country estate; CBA3: Develop collaborative working arrangements with Traditional Owners which establish mutual trust and build Indigenous capacity; and, MTR* CBA1: Strengthen community efforts to address climate change impacts on the Reef by: empowering partners to be part of actions to build Reef resilience.</li> <li>• An enabling activity for <b>Reef 2050 Plan Governance actions</b>: GA7: When reviewing relevant agreements, policies, plans, strategies and programs ensure they support the Plan's outcomes and targets; GA11: Improve Traditional Owner participation in governance arrangements for protection and management of the Reef; and, GA12: Prioritise and develop specific implementation plans and reporting protocols addressing the Plan's targets and actions in consultation with the community.</li> </ul>
<p>Traditional Owner and Community Reef Protection</p>	<p>Establish a Traditional Owner Futures Fund.</p>	<p>Independent and sustainable financing is needed to support governance, future leadership activities (such as student scholarships) and strategic investments which build Traditional Owner capacity and capability in Reef management.</p>	<p>Futures Fund established to support and strengthen the role of Traditional Owners in Reef governance, foster new and sustainable partnerships and promote enduring Reef protection outcomes.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• An enabling activity for <b>Reef 2050 Plan Ecosystem Health target</b> (EHT2): The number of agreements with Traditional Owners addressing management of ecosystems within their traditional estates is increased.</li> <li>• Directly contributes to <b>Reef 2050 Plan Economic Benefits target</b> (EBT2): Number of employment opportunities for Traditional Owners in sea country management and Reef-based industries is increased.</li> <li>• An enabling activity for <b>Reef 2050 Plan Heritage target</b> (HT3): Partnerships between Traditional Owners and all stakeholders are increased to ensure key Reef heritage values are identified, documented, and monitored.</li> <li>• An enabling activity for <b>Reef 2050 Plan Community Benefit target</b> (CBT3): Community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul>



RTP Component	Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
				<p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• An enabling activity for <b>Reef 2050 Plan Ecosystem Health actions</b>: EHA2: Incorporate and prioritise Traditional Owners' planning into existing future ecosystem policy and programs; EHA3: Support Traditional Owner stewardship activities that contribute to Reef health and resilience, including removing and, where possible, identifying the sources of marine debris; and EHA4: Develop further agreements with Traditional Owners addressing management of ecosystems within their traditional estates.</li> <li>• An enabling activity for <b>Reef 2050 Plan Biodiversity action</b> (BA3): Improve Traditional Owner engagement to strengthen participation in decision making at all levels relating to the conservation and cultural use of biodiversity.</li> <li>• An enabling activity for <b>Reef 2050 Plan Heritage action</b> (HA1): Build capacity for the involvement of Traditional Owners and community members in cooperative management, planning and impact assessment.</li> <li>• An enabling activity for <b>Reef 2050 Plan Community Benefit actions</b>: CBA2: Work with Traditional Owners to identify world's best practice in agreement making, strategic planning, and management and implementation of Indigenous programs in relation to Great Barrier Reef sea country estate; CBA3: Develop collaborative working arrangements with Traditional Owners which establish mutual trust and build Indigenous capacity; and, MTR* CBA1: Strengthen community efforts to address climate change impacts on the Reef by: empowering partners to be part of actions to build Reef resilience.</li> <li>• An enabling activity for <b>Reef 2050 Plan Governance actions</b>: GA7: When reviewing relevant agreements, policies, plans, strategies and programs ensure they support the Plan's outcomes and targets; GA11: Improve Traditional Owner participation in governance arrangements for protection and management of the Reef; and, GA12: Prioritise and develop specific implementation plans and reporting protocols addressing the Plan's targets and actions in consultation with the community.</li> </ul>
<p>Traditional Owner and Community Reef Protection</p>	<p>Land and sea action and investment planning.</p> <p>(2018-2019 investment projects)</p>	<p>Country-based planning and implementation provides a structured approach for groups to articulate and understand the values and aspirations of their land and sea country for improved management.</p> <p>Indigenous heritage including biocultural systems, culturally significant species and important habitats are mapped and monitored.</p>	<p>Traditional Owners on-country activities contribute to Reef biocultural health, Key Reef heritage values and places are identified, mapped, monitored and report on.</p> <p>Traditional Owners are supported to collect, store and manage their own Country-based information for decision making.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Contributes to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT2): The number of agreements with Traditional Owners addressing management of ecosystems within their traditional estates is increased; and (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target</b> (BT1): Customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or cultural use requirements, are formally recognised and adopted in management arrangements; and (BT2): Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> <li>• Contributes to <b>Reef 2050 Plan Heritage targets</b> (HT1): New and effective cooperative management practices are developed for protection and conservation of Great Barrier Reef Indigenous and non-Indigenous heritage; (HT2): Indigenous and non-Indigenous heritage values and are identified, documented and protected in decision-making and planning processes; and (HT3): Partnerships between Traditional Owners and all stakeholders are increased to ensure key Reef heritage values are identified, documented and monitored.</li> <li>• Contributes to <b>Reef 2050 Plan Economic Benefit targets</b> (EBT2): The number of employment opportunities for Traditional Owners in sea country management and Reef-based industries is increased.</li> </ul>

RTP Component	Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
		<p>Traditional Owners connect and learn about culture and country to keep strong.</p>		<p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health actions</b>: EHA2: Incorporate and prioritise Traditional Owners’ planning into existing future ecosystem policy and programs; EHA3: Support Traditional Owner stewardship activities that contribute to Reef health; and EHA4: Develop further agreements with Traditional Owners addressing management of ecosystems within their traditional estates.</li> <li>• Directly contributes to <b>Reef 2050 Plan Biodiversity action (BA1)</b>: Where agreed through Traditional Owner engagement frameworks, apply traditional knowledge and customary use of biological diversity, including the use of community protocols, in managing protected areas; <b>(BA2)</b>: Work with Traditional Owner groups to identify biocultural resources within their sea country and develop plans of management for conservation and use of those resources; <b>(BA3)</b>: Improve Traditional Owner engagement to strengthen participation in decision making at all levels relating to the conservation and cultural use of biodiversity; and <b>(BA4)</b>: Work with Traditional Owners to build capacity to record and manage Traditional Ecological Knowledge, and prioritise research go address key Indigenous Knowledge gaps.</li> <li>• Directly contributes to <b>Reef 2050 Plan Heritage action (HA1)</b>: Build capacity for the involvement of Traditional Owners and community members in cooperative management, planning and impact assessment.</li> <li>• Directly contributes to <b>Reef 2050 Water Quality Improvement Plan catchment restoration actions (A3)</b> including: Partner with voluntary stewardship groups, Traditional Owner groups, Indigenous Land and Sea Rangers and other organisations to deliver catchment repair projects (A3.5); and <b>culture and innovation actions (A2)</b>, including: Provide incentives to support land managers, including Traditional Owners, with practice change (A2.5).</li> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit actions</b>: <b>(CBA2)</b>: Work with Traditional Owners to identify world’s best practice in agreement making, strategic planning, and management and implementation of Indigenous programs in relation to Great Barrier Reef sea country estate; <b>(CBA3)</b>: Develop collaborative working arrangements with Traditional Owners which establish mutual trust and build Indigenous capacity; and <b>(MTR* CBA1)</b>: Strengthen community efforts to address climate change impacts on the Reef by empowering partners to be part of actions to build Reef resilience.</li> <li>• Directly contributes to <b>Reef 2050 Plan Governance actions (GA11)</b>: Improve Traditional Owner participation in governance arrangements for protection and management of the Reef.</li> </ul>

RTP Component	Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
Water Quality	Indigenous Knowledge systems, innovations, co-design pathways and on-ground actions for healthy water (catchment to reef).	<p>Traditional Owners require better engagement in the Reef 2050 Water Quality Improvement Plan and related funding opportunities.</p> <p>Consideration of Indigenous values in current water quality programs are needed to improve decision making.</p> <p>Adoption of co-design approaches in Reef Trust Partnership Water Quality Component will improve active participation and maximise benefits for Traditional Owners.</p>	<p>Increased awareness and consideration of Indigenous Knowledge and cultural values in the design and delivery of the Partnership Water Quality Component and broader Reef 2050 Water Quality Improvement Plan programs.</p> <p>An increase in Traditional Owner-led water quality improvement projects.</p> <p>Water quality programs incorporate education and employment pathways for Traditional Owners.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT2): The number of agreements with Traditional Owners addressing management of ecosystems within their traditional estates is increased.</li> <li>• Directly contributes to <b>Reef 2050 Plan Economic Benefits target</b> (EBT2): number of employment opportunities for Traditional Owners in sea country management and Reef-based industries is increased.</li> <li>• Directly contributes to the <b>Reef 2050 Water Quality Improvement Plan human dimension target</b> to increase active engagement of communities and land managers in programs to improve water quality outcomes.</li> <li>• Directly contributes to <b>Reef 2050 Plan Heritage target</b> (HT3): Partnerships between Traditional Owners and all stakeholders are increased to ensure key Reef heritage values are identified, documented, and monitored.</li> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit target</b> (CBT3): Community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health actions</b>: EHA2: Incorporate and prioritise Traditional Owners' planning into existing future ecosystem policy and programs; EHA3: Support Traditional Owner stewardship activities that contribute to Reef health; and EHA4: Develop further agreements with Traditional Owners addressing management of ecosystems within their traditional estates.</li> <li>• Directly contributes to <b>Reef 2050 Plan Biodiversity action</b> (BA3): Improve Traditional Owner engagement to strengthen participation in decision making at all levels relating to the conservation and cultural use of biodiversity.</li> <li>• Directly contributes to <b>Reef 2050 Plan Heritage action</b> (HA1): Build capacity for the involvement of Traditional Owners and community members in cooperative management, planning and impact assessment.</li> <li>• Directly contributes to <b>Reef 2050 Water Quality Improvement Plan catchment restoration actions</b> (A3) including: Partner with voluntary stewardship groups, Traditional Owner groups, Indigenous Land and Sea Rangers and other organisations to deliver catchment repair projects (A3.5); and <b>culture and innovation actions</b> (A2), including: Provide incentives to support land managers, including Traditional Owners, with practice change (A2.5).</li> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit actions</b>: CBA2: Work with Traditional Owners to identify world's best practice in agreement making, strategic planning, and management and implementation of Indigenous programs in relation to Great Barrier Reef sea country estate; CBA3: Develop collaborative working arrangements with Traditional Owners which establish mutual trust and build Indigenous capacity; and, MTR* CBA1: Strengthen community efforts to address climate change impacts on the Reef by: empowering partners to be part of actions to build Reef resilience.</li> <li>• Directly contributes to <b>Reef 2050 Plan Governance actions</b>: GA7: When reviewing relevant agreements, policies, plans, strategies and programs ensure they support the Plan's outcomes and targets; GA11: Improve Traditional Owner participation in governance arrangements for protection and management of the Reef; and, GA12: Prioritise and develop specific implementation plans and reporting protocols addressing the Plan's targets and actions in consultation with the community.</li> </ul>

RTP Component	Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
Crown-of-Thorns Starfish Control	Establishing clear pathways for Traditional Owners to achieve culturally-grounded economic enterprises for effective COTS surveillance and control.	<p>There is a recognised need for Traditional Owner groups to be directly involved in decision making and management of reefs and activities on their sea country.</p> <p>There is a need to create culturally appropriate pathways for Traditional Owners to increase employment opportunities, build partnerships, co-design programs, diversify skillsets and lead economic enterprises related to COTS surveillance and control.</p>	<p>A pathway with clear steps for Traditional Owners to achieve culturally-grounded economic enterprises for effective COTS surveillance and control is established.</p> <p>Progression towards Traditional Owner enterprises being included on the preferred panel of providers for COTS control and surveillance.</p> <p>Cultural guidelines (protocols) are adopted by agencies, institutions and private sector partners undertaking COTS research, surveillance and control.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT2): The number of agreements with Traditional Owners addressing management of ecosystems within their traditional estates is increased.</li> <li>• Directly contributes to <b>Reef 2050 Plan Economic Benefits target</b> (EBT2): Number of employment opportunities for Traditional Owners in sea country management and Reef-based industries is increased.</li> <li>• Directly contributes to the coral reef component of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> <li>• Directly contributes to <b>Reef 2050 Plan Heritage target</b> (HT3): Partnerships between Traditional Owners and all stakeholders are increased to ensure key Reef heritage values are identified, documented, and monitored.</li> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit target</b> (CBT3): Community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Supports and expands the on-ground delivery of actions forming a key part of <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA2): Implement an integrated crown-of-thorns starfish management framework within the marine parks to guide and coordinate efforts by all partners to reduce coral predation and maximise live coral cover on identified reefs.</li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health actions</b>: EHA2: Incorporate and prioritise Traditional Owners’ planning into existing future ecosystem policy and programs; EHA3: Support Traditional Owner stewardship activities that contribute to Reef health; and EHA4: Develop further agreements with Traditional Owners addressing management of ecosystems within their traditional estates.</li> <li>• Directly contributes to <b>Reef 2050 Plan Biodiversity action</b> (BA3): Improve Traditional Owner engagement to strengthen participation in decision making at all levels relating to the conservation and cultural use of biodiversity.</li> <li>• Directly contributes to <b>Reef 2050 Plan Heritage action</b> (HA1): Build capacity for the involvement of Traditional Owners and community members in cooperative management, planning and impact assessment.</li> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit actions</b>: CBA2: Work with Traditional Owners to identify world’s best practice in agreement making, strategic planning, and management and implementation of Indigenous programs in relation to Great Barrier Reef sea country estate; CBA3: Develop collaborative working arrangements with Traditional Owners which establish mutual trust and build Indigenous capacity; and, MTR* CBA1: Strengthen community efforts to address climate change impacts on the Reef by: empowering partners to be part of actions to build Reef resilience.</li> <li>• Directly contributes to <b>Reef 2050 Plan Governance actions</b>: GA7: When reviewing relevant agreements, policies, plans, strategies and programs ensure they support the Plan’s outcomes and targets; GA11: Improve Traditional Owner participation in governance arrangements for protection and management of the Reef; and, GA12: Prioritise and develop specific implementation plans and reporting protocols addressing the Plan’s targets and actions in consultation with the community.</li> </ul>

RTP Component	Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
Reef Restoration and Adaptation Science	<p>Establish Traditional Owner-led governance arrangements for strategic and cultural oversight of this component.</p> <p>Deep engagement with Traditional Owners to develop guidelines, foundational principles and implementation of practices to ensure respect for biocultural ethics.</p> <p>Implementation of actions to diversify skillsets, build capacity, Indigenous-led research and to formalise education and employment pathways.</p>	<p>Traditional Owners hold inherent rights to the Reef and have successfully cared for their traditional homeland estates since time immemorial. Over the last century they have witnessed increased pressures and a changing environment. This carries with it a deep sadness for the loss of their healthy Country. Traditional Owners must therefore form part of the solution to increase the health of the Reef.</p> <p>There is a need to create culturally appropriate pathways and make resources available for Traditional Owners to diversify skillsets, build capacity, contribute to and lead research, and to formalise education and employment pathways to heal country and people.</p>	<p>Traditional Owner biocultural ethics guide participation through established governance arrangements.</p> <p>Traditional Owners' on-country activities contribute to Reef health and resilience.</p> <p>Engagement with Traditional Owners builds strong mutual understanding of risks and benefits.</p> <p>Biocultural guidelines, principles and practices are adopted by agencies, institutions and private sector partners undertaking Reef restoration and adaptation activities.</p> <p>Education and career pathways are embedded in programs across all phases of delivery.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT2): The number of agreements with Traditional Owners addressing management of ecosystems within their traditional estates is increased.</li> <li>• Directly contributes to <b>Reef 2050 Plan Economic Benefits target</b> (EBT2): Number of employment opportunities for Traditional Owners in sea country management and Reef-based industries is increased.</li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales; and <b>Reef 2050 Plan Biodiversity target</b> (BT2): Trends in the availability and condition of habitat for species of conservation concern are improving at Reef-wide and regionally relevant scales.</li> <li>• Contributes to <b>Reef 2050 Plan Community Benefit target</b> (CBT3): Community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health actions</b>: EHA2: Incorporate and prioritise Traditional Owners' planning into existing future ecosystem policy and programs; EHA3: Support Traditional Owner stewardship activities that contribute to Reef health; EHA4: Develop further agreements with Traditional Owners addressing management of ecosystems within their traditional estates; and MTR* EHA3: Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint, specifically: facilitating opportunities for community and industry participation in local-scale restoration.</li> <li>• Directly contributes to <b>Reef 2050 Plan Biodiversity action</b> (BA3): Improve Traditional Owner engagement to strengthen participation in decision making at all levels relating to the conservation and cultural use of biodiversity.</li> <li>• Directly contributes to <b>Reef 2050 Plan Heritage action</b> (HA1): Build capacity for the involvement of Traditional Owners and community members in cooperative management, planning and impact assessment.</li> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit actions</b>: CBA2: Work with Traditional Owners to identify world's best practice in agreement making, strategic planning, and management and implementation of Indigenous programs in relation to Great Barrier Reef sea country estate; CBA3: Develop collaborative working arrangements with Traditional Owners which establish mutual trust and build Indigenous capacity; and, MTR* CBA1: Strengthen community efforts to address climate change impacts on the Reef by empowering partners to be part of actions to build Reef resilience.</li> <li>• Directly contributes to <b>Reef 2050 Plan Governance actions</b>: GA7: When reviewing relevant agreements, policies, plans, strategies and programs ensure they support the Plan's outcomes and targets; GA11: Improve Traditional Owner participation in governance arrangements for protection and management of the Reef; and, GA12: Prioritise and develop specific implementation plans and reporting protocols addressing the Plan's targets and actions in consultation with the community.</li> </ul>

RTP Component	Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
<p>Integrated Monitoring and Reporting</p>	<p>Implement the Strong Peoples-Strong Country Framework; including negotiation of data sharing agreements; audit of monitoring skills, tools and assets; and development and implementation of education and employment pathways.</p>	<p>Traditional Owners are the keepers of Indigenous Knowledge and cultural values and have observed dramatic changes on their country.</p> <p>The Strong Peoples-Strong Country Framework provides the basis for understanding the Reef as a biocultural ecosystem and requires investment to develop indicators to understand the condition and status of Indigenous heritage in the Reef.</p> <p>There is a need to resource Traditional Owners to build capacity and diversify skill sets to enable recording and appropriate sharing of Indigenous Knowledge and information.</p>	<p>Culturally grounded approaches to monitoring, evaluation and reporting are embedded across the Partnership.</p> <p>Data sharing agreements are established to ensure Traditional Owner's Intellectual Property is protected and information about Indigenous Knowledge and cultural values are safeguarded and shared appropriately.</p> <p>Greater opportunities and increased capacity and capability for Traditional Owners to undertake monitoring are provided.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT2): The number of agreements with Traditional Owners addressing management of ecosystems within their traditional estates is increased.</li> <li>• Directly contributes to <b>Reef 2050 Plan Economic Benefits target</b> (EBT2): The number of employment opportunities for Traditional Owners in sea country management and Reef-based industries is increased.</li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT1): Traditional Owners have developed Indigenous Ecological Knowledge Management Systems for collecting, handling and sharing culturally information and its integration in decision making.</li> <li>• Directly contributes to <b>Reef 2050 Plan Heritage target</b> (HT3): Partnerships between Traditional Owners and all stakeholders are increased to ensure key Reef heritage values are identified, documented, and monitored.</li> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit target</b> (CBT3): Community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Integrated Monitoring and Reporting Action</b> (MTR*4): Develop and implement an Integrated Monitoring and Reporting Program.</li> <li>• Is a foundational activity contributing to <b>Reef 2050 Plan Ecosystem Health actions:</b> (EHA5): Develop, implement and coordinate a protocol and knowledge management system for recording, storing, protection and, where appropriate, sharing of knowledge, innovations and practices; conserving and cultural use of biocultural diversity; and use in decision making; (EHA2): Incorporate and prioritise Traditional Owners' planning into existing future ecosystem policy and programs; (EHA3): Support Traditional Owner stewardship activities that contribute to Reef health; and (EHA4): Develop further agreements with Traditional Owners addressing management of ecosystems within their traditional estates.</li> <li>• Is a foundational activity contributing to <b>Reef 2050 Plan Biodiversity actions</b> (BA4): Work with Traditional Owners to build capacity to record and manage Traditional Ecological Knowledge, and prioritise research go address key Indigenous Knowledge gaps; and (BA3): Improve Traditional Owner engagement to strengthen participation in decision making at all levels relating to the conservation and cultural use of biodiversity.</li> <li>• Is a foundational activity underpinning <b>Reef 2050 Plan Heritage action</b> (HA1): Build capacity for the involvement of Traditional Owners and community members in cooperative management, planning and impact assessment.</li> <li>• Is a foundational activity contributing to <b>Reef 2050 Plan Community Benefit actions:</b> (CBA2): Work with Traditional Owners to identify world's best practice in agreement making, strategic planning, and management and implementation of Indigenous programs in relation to Great Barrier Reef sea country estate; (CBA3): Develop collaborative working arrangements with Traditional Owners which establish mutual trust and build Indigenous capacity; and (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by empowering partners to be part of actions to build Reef resilience.</li> <li>• Is a foundational activity contributing to <b>Reef 2050 Plan Governance actions:</b> (GA7): When reviewing relevant agreements, policies, plans, strategies and programs ensure they support the Plan's outcomes and targets; (GA11): Improve Traditional Owner participation in governance arrangements for protection and management of the Reef; and (GA12): Prioritise and develop specific implementation plans and reporting protocols addressing the Plan's targets and actions in consultation with the community.</li> </ul>

## 1.5 Community Reef Protection Component contributions to Reef 2050 Plan Outcomes, Objectives, Targets and Actions

Community Reef Protection activities directly contribute to the delivery of actions and targets under the Reef 2050 Plan Ecosystem Health (EH), Biodiversity (B), Heritage (H), Community Benefits (CB) and Governance (G) themes.

The following table outlines how Community Reef Protection Component activities and outcomes, as outlined in the Annual Work Plan, align with and contribute to achievement of Reef 2050 Plan targets and actions. In turn, these actions and targets collectively contribute to:

**Reef 2050 Plan Community Benefit outcome:**

*An informed community that plays a role in protecting the Reef for the benefits a healthy Reef provides for current and future generations.*

**Reef 2050 Plan objectives:**

- **Community Benefits:** Community benefits provided by the Reef, including its superlative natural beauty and the sense of place, are maintained for current and future generations (CB03).
- **Community Benefits:** Local, regional and Reef-wide community benefits are understood and the community is actively engaged in managing Reef activities (CBO4).

- **Heritage:** Indigenous and non- Indigenous heritage including natural, aesthetic, historic, scientific, and social values are identified, conserved and managed in partnership with the community (HO2).
- **Economic Benefits:** Reef-dependent industries are productive and profitable based on a healthy Reef and are ecologically sustainable (EBO4).
- **Governance:** Strong partnerships with Traditional Owners, industry, researchers and the community support protection and management of the Reef (GO3).

Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
Citizen science: Support strategic and collaborative citizen science data collection, reporting and application.	Citizen science can address priority data needs for science, management and community, as well as provide a platform for effective partnerships and place-based approaches that align with the broader Reef 2050 Plan. Yet while citizen science is gaining momentum, there is much greater potential for data from programs to inform management and offer greater community benefits.	A framework for strategic citizen science partnerships will: <ul style="list-style-type: none"> <li>• enhance how community informs, and is informed by, local/regional decision-making</li> <li>• increase community understanding about Reef health</li> <li>• boost community benefits and enhance efficacy in Reef stewardship.</li> </ul>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit's target</b> (CBT3): Community participation in stewardship actions to improve Reef and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit Action</b> (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by empowering partners to be part of actions to build Reef resilience.</li> <li>• Also contributes to <b>Reef 2050 Plan Integrated Monitoring and Reporting Action</b> (MTR*4): Develop and implement an Integrated Monitoring and Reporting Program.</li> </ul>
Local Reef restoration: Develop and implement local Reef restoration demonstration sites.	Reef restoration has been identified as an important emerging priority for the Reef. There is high interest from the community to support this work.	<ul style="list-style-type: none"> <li>• A series of demonstration sites identified.</li> <li>• Pilot reef restoration activities undertaken with Reef community partners (particularly tourism, Traditional Owners and community groups).</li> </ul>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit's target</b> (CBT3): Community participation in stewardship actions to improve Reef and resilience continues to grow.</li> <li>• Also contributes to the coral component- local scale of the <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> </ul>

Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
		<ul style="list-style-type: none"> <li>• Best-practice local-scale restoration methods are shared and refined – including improved measures of success spanning environmental, social, economic and cultural indicators.</li> </ul>	<p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit Action</b> (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by empowering partners to be part of actions to build Reef resilience.</li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health action</b> (MTR* EHA3): Investigate, deliver and support active localised restoration activities, as identified in the Reef Blueprint, specifically: facilitating opportunities for community and industry participation in local-scale restoration.</li> </ul>
<p>Local action projects: Support collaborative community projects to address local Reef threats using strategic place-based approaches.</p>	<p>GBRMPA's Local Marine Advisory Committees already provide a platform to directly connect community with decision-making and offer a network for scalable approaches to implement regional Reef Blueprint priorities. Providing support for inclusive project planning can further activate and empower this network of dedicated community members.</p>	<p>Projects will increase ownership, knowledge-sharing and collaboration to deliver local actions on priority Reef threats, and wider benefits across Reef communities. Projects will trial and embed frameworks for collective action and enhance engagement (including youth) in this Reef-wide community advisory network.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit's target</b> (CBT3): Community participation in stewardship actions to improve Reef and resilience continues to grow.</li> <li>• Delivers local-scale outcomes contributing to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> <li>• Also contributes to <b>Reef 2050 Plan Governance target</b> (GT3): Actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the Reef.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit action</b> (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by empowering partners to be part of actions to build Reef resilience.</li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem health action</b> (MTR EHA4): Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint.</li> </ul>
<p>Integrated decision-making: Facilitate pathways and platforms to foster knowledge exchange and develop regional Community Action Plans for Reef protection projects.</p>	<p>Effective integration of top-down and bottom-up approaches can help to deliver key management priorities as well as recognise and foster the important role of community action. Promoting exchanges to clarify understanding and opportunity will help to drive more effective local-scale actions and integration with broader Reef and catchment-wide management approaches. This will build on RIMReP and other strategic frameworks.</p>	<p>Community Action Plans will provide inclusive, integrated and adaptive frameworks for community Reef protection efforts that deliver against key Reef management priorities. Duplication of efforts will be decreased. New/ strengthened partnerships will be formed between community groups and managers/policy-makers. Community will have greater ownership of plans and outcomes.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to the <b>Reef 2050 Plan Community Benefit's target</b> (CBT3): Community participation in stewardship actions to improve Reef and resilience continues to grow.</li> <li>• Acts as an enabling action contributing to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> <li>• Supports <b>Reef 2050 Plan Governance targets</b> (GT4): Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience.</li> </ul>



Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
			<p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit Action</b> (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by:               <ul style="list-style-type: none"> <li>– communicating the implications of climate change on the Reef and the outcomes required to secure its future</li> <li>– empowering partners to be part of actions to build Reef resilience.</li> </ul> </li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem health action</b> (MTR EHA4): Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint.</li> <li>• Contributes to <b>Reef 2050 Plan Governance action</b> (GA12): Prioritise and develop specific implementation plans and reporting protocols addressing the Plans targets and actions in consultation with the community.</li> </ul>
<p>National Reef Protection Challenge: Develop and implement a collaborative initiative to support targeted behaviour change to protect the Reef.</p>	<p>Australians are proud of the Reef and feel a sense of responsibility to protect it, but many do not feel optimistic about its future. Despite the demonstrated interest in stewardship actions, many people feel they do not have the necessary knowledge and skills to reduce impacts they have on the Reef (Marshall et al 2017). This initiative will foster wide-scale participation in a Reef protection challenge to deliver measurable behaviour change outcomes to address key threats at multiple scales – personal, local, and nationwide.</p>	<p>The first national-scale Reef protection challenge will:</p> <ul style="list-style-type: none"> <li>• Build positive attitudes, intention and participation in targeted behaviours that reduce Reef threats</li> <li>• Build hope for the future of Reef resilience through collective action</li> <li>• Build partnerships and efficacy across community networks such as tourism, councils, education, community groups, local business.</li> </ul>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to the <b>Reef 2050 Plan Community Benefit's target</b> (CBT3): Community participation in stewardship actions to improve Reef and resilience continues to grow.</li> <li>• Also acts as an enabling action contributing to <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Community Benefit Action</b> (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by:               <ul style="list-style-type: none"> <li>– communicating the implications of climate change on the Reef and the outcomes required to secure its future</li> <li>– empowering partners to be part of actions to build Reef resilience.</li> </ul> </li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem health action</b> (MTR EHA4): Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint.</li> </ul>
<p>Communicate case studies and stories of hope</p>	<p>Capturing and sharing community-driven solutions from a range of people and projects has been identified as a key need to celebrate success and inspire increased engagement.</p>	<p>Partnership communication and mass communication will support a knowledge sharing network. Communicating positive outcomes will demonstrate progress, acknowledge the work of individuals and community organisations and motivate others to get involved.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• An enabling activity contributing to <b>Reef 2050 Plan Community Benefit target</b> (CBT3): Community participation in stewardship actions to improve Reef health and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Contributes to <b>Reef 2050 Plan Ecosystem health action</b> (MTR EHA4): Determine the best measures to reduce impacts, improve resilience and implement a coral reef resilience network as identified in the Reef Blueprint; specifically, initiatives to: empower people to be part of the solution; fostering partnerships for action and innovation and building awareness and support.</li> </ul>

Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
Support enduring investment and partnership models: Enhance community Reef protection models to foster long-term organisational sustainability, impact and investment.	While extensive work is taking place across communities, there is no comprehensive benchmark that documents community stewardship effort and impact across the Reef and its catchments. Addressing the challenge of small, inconsistent grant-based funding for community Reef protection activities has been identified as a key barrier to achieving more efficient and enduring outcomes.	A dynamic business model for Community Reef protection partnerships and investment will be developed and made available. A stewardship audit and impact assessment will create a baseline for celebrating current work, showcasing greater potential, and measuring changes in stewardship actions delivered with partners through the Reef Trust Partnership.	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>An enabling activity creating the conditions for enduring outcomes and contributing to the <b>Reef 2050 Plan Community Benefit's target</b> (CBT3): Community participation in stewardship actions to improve Reef and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>An enabling activity creating the conditions for sustainable models to deliver on <b>Reef 2050 Plan Community Benefit Action</b> (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by empowering partners to be part of actions to build Reef resilience.</li> </ul>
Empower community heroes: Identify and deliver key capacity building needs for individuals and organisations to amplify partnerships and leadership	Addressing shared challenges and areas for growth can boost capacity across the community. The following areas have been identified: cultural capacity building to foster greater partnership opportunities with Traditional Owners, enhanced monitoring and evaluation skills to document community project impact and empowering youth leadership.	Capacity building initiatives will strengthen individual, organisational and sector-wide capacity to support place-based, sector-based and youth empowerment activities with the goal to enhance community stewardship outcomes.	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>Directly contributes to the <b>Reef 2050 Plan Community Benefit's target</b> (CBT3): Community participation in stewardship actions to improve Reef and resilience continues to grow.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Directly contributes to <b>Reef 2050 Plan Community Benefit Action</b> (MTR* CBA1): Strengthen community efforts to address climate change impacts on the Reef by empowering partners to be part of actions to build Reef resilience.</li> </ul> <p>Also see 1.4 Traditional Owner Reef Protection Component.</p>

## 1.6 Reef Integrated Monitoring and Reporting Component contributions to Reef 2050 Plan Outcomes, Objectives, Targets and Actions

Reef Integrated Monitoring and Reporting Component activities directly contribute to the delivery of actions and targets under the Reef 2050 Plan Governance (G) theme. It also underpins the delivery of monitoring and reporting across all seven themes with each theme referring to the Mid-Term Review Governance Action 4 – *to develop and implement a Reef Integrated Monitoring and Reporting Program*.

The following table outlines how Reef Integrated Monitoring and Reporting Component activities and outcomes, as outlined in the Annual Work Plan, align with and contribute to achievement of Reef 2050 Plan targets and actions. In turn, these actions and targets collectively contribute to:

- Reef 2050 Plan Governance outcome:**  
*The Outstanding Universal Value of the Reef is maintained and enhanced each successive decade through effective governance arrangements and coordinated management activities.*

*Reef 2050 Plan Governance objective:*

*An adaptive management approach underpins implementation of this Plan and results in improved governance arrangements and processes.*

Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
<p>2018-2019 investment project – Essential coral reef monitoring in the northern Great Barrier Reef.</p>	<p>To provide an updated ‘baseline’ assessment of reef condition and recovery in the northern Great Barrier Reef ahead of what was perceived as a significant risk of a potential bleaching event in early 2019.</p>	<p>In-water surveys of coral and fish communities on up to 23 reefs in the northern sector of the Reef.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Supports <b>Reef 2050 Plan Governance targets</b> (GT4): Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience.</li> <li>• Enables tracking of <b>Reef 2050 Plan Ecosystem Health target</b> (EHT5): Condition and resilience indicators for coral reefs, seagrass meadows, islands, estuaries, shoals and inter-reefal habitats are on a trajectory towards at least good condition at local, regional and Reef-wide scales.</li> <li>• Contributes to <b>Reef 2050 Plan Governance target</b> (GT3): Actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the Reef.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Contributes to <b>Reef 2050 Plan Governance Action</b> (MTR* GA4): Develop and implement a Reef Integrated Monitoring and Reporting Program, specifically: <ul style="list-style-type: none"> <li>– enabling timely and suitable responses by Reef managers and partners to emerging issues and risks</li> <li>– enabling the evaluation of whether the Reef 2050 Plan is on track to meet its outcomes, objectives and targets.</li> </ul> </li> </ul>
<p>Investment in critical monitoring activities based on RIMReP findings and Partnership prioritisation.</p>	<p>A prerequisite to transformational investments is ensuring the foundations are sound, which means adequate baseline monitoring is in place.</p> <p>The first phase of RIMReP has systematically identified critical monitoring activities needed to support an integrated program. This Partnership funding is expected to make a significant contribution to addressing priority gaps alongside other funding sources.</p>	<p>Progress towards a comprehensive and strategically designed integrated monitoring program for the Reef.</p> <p>Critical needs have been prioritised and addressed.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Governance Target</b> (GT5): A comprehensive Integrated Monitoring and Reporting Program is established and operational and the reporting informs review and updating of this Plan.</li> <li>• Contributes to <b>Reef 2050 Plan Governance targets</b> (GT4): Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience</li> <li>• Contributes to <b>Reef 2050 Plan Governance target</b> (GT3): Actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the reef.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Governance Action</b> (MTR* GA4): Develop and implement a Reef Integrated Monitoring and Reporting Program, specifically: <ul style="list-style-type: none"> <li>– facilitates adaptive management for the Reef that is effective, efficient and evolving</li> <li>– enabling timely and suitable responses by Reef managers and partners to emerging issues and risks</li> <li>– enabling the evaluation of whether the Reef 2050 Plan is on track to meet its outcomes, objectives and targets.</li> </ul> </li> </ul>

Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
<p>Scoping, development and prototyping of an operational Reef decision-support platform.</p>	<p>The Reef needs a consistent and transparent approach to decision-making based on data that is current and accurate and on models that enable forecasting and scenario planning.</p>	<p>Integrated, tactical and strategic DSS is operational.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Governance Target</b> (GT5): A comprehensive Integrated Monitoring and Reporting Program is established and operational and the reporting informs review and updating of this Plan.</li> <li>• Contributes to <b>Reef 2050 Plan Governance targets</b> (GT4): Investment in actions is prioritised using evidence-based risk assessment to maximise benefits for Reef health and resilience.</li> <li>• Supports <b>Reef 2050 Plan Governance target</b> (GT3): Actions under this Plan are prioritised and tailored to reflect local or regional differences in threats to the values of the Reef.</li> <li>• Supports to <b>Reef 2050 Plan Heritage Target</b> (HT2): Indigenous and non-Indigenous heritage values are identified, documented and protected in decision-making and planning processes.</li> <li>• Supports <b>Reef 2050 Community Benefit Target</b> (CBT2): Community benefit values have been identified and are considered in decision making.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Governance Action</b> (MTR* GA4): Develop and implement a Reef Integrated Monitoring and Reporting Program, specifically: <ul style="list-style-type: none"> <li>– facilitates adaptive management for the Reef that is effective, efficient and evolving</li> <li>– enabling timely and suitable responses by Reef managers and partners to emerging issues and risks</li> <li>– enabling the evaluation of whether the Reef 2050 Plan is on track to meet its outcomes, objectives and targets.</li> </ul> </li> </ul> <p>This action supports monitoring and reporting activities across each of the Reef 2050 Plan's seven themes and is referred to under each theme.</p>
<p>Design and implementation of a Technology Transformation Fund supported by industry.</p>	<p>Recognising the perpetual need for more monitoring data (more locations, more often), there is a need for investment in transformative technologies that improve the cost-effectiveness of monitoring programs, either by improving existing approaches or developing new strategies to access the required information.</p> <p>There are also opportunities to increase access to high value data by innovating in the operationalisation of systems, improving scalability and user access. Such systems include models (such as eReefs), data sharing and visualisation platforms and decision-making systems.</p>	<p>New technologies are demonstrated and adopted that improve the cost-effectiveness of a Reef integrated monitoring program.</p> <p>Industry and research institutions take a collaborative approach to the operationalisation of critical systems underpinning a Reef integrated monitoring program.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• An enabling activity contributing to <b>Reef 2050 Plan Governance Target</b> (GT5): A comprehensive Integrated Monitoring and Reporting Program is established and operational and the reporting informs review and updating of this Plan.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• An enabling activity contributing to <b>Reef 2050 Plan Governance Action</b> (MTR* GA4): Develop and implement a Reef Integrated Monitoring and Reporting Program, specifically: <ul style="list-style-type: none"> <li>– facilitates adaptive management for the Reef that is effective, efficient and evolving</li> <li>– enabling timely and suitable responses by Reef managers and partners to emerging issues and risks</li> <li>– enabling the evaluation of whether the Reef 2050 Plan is on track to meet its outcomes, objectives and targets.</li> </ul> </li> </ul> <p>This action supports monitoring and reporting activities across each of the Reef 2050 Plan's seven themes and is referred to under each theme.</p>

Partnership Activity	Why?	Outcome	Reef 2050 Targets and Actions
<p>Traditional Owner-led integrated monitoring and reporting initiatives (to be defined with Traditional Owner Reef Protection Component)</p>	<p>There is a need to promote positive engagement to protect and maintain culture and heritage values, improve the cycle of research information to management, build or maintain capacity of Traditional Owners and support transition into sunrise industries for increased business enterprise opportunities.</p>	<p>Traditional Owner innovations from Indigenous Knowledge systems inform Strong Peoples-Strong Country Framework and data sharing agreements.</p> <p>Scoping of readiness and upskilling opportunities for Traditional Owner groups to transition to monitoring activities.</p>	<p><b>Targets</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health Target</b> (EHT1): Traditional Owners have developed Indigenous Ecological Knowledge Management Systems for collecting, handling and sharing culturally information and its integration in decision making.</li> <li>• Directly contributes to <b>Reef 2050 Plan Governance Target</b> (GT5): A comprehensive Integrated Monitoring and Reporting Program is established and operational and the reporting informs review and updating of this Plan.</li> <li>• Supports to <b>Reef 2050 Plan Heritage Target</b> (HT2): Indigenous and non-Indigenous heritage values are identified, documented and protected in decision-making and planning processes.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Directly contributes to <b>Reef 2050 Plan Governance Action</b> (MTR* GA4): Develop and implement a Reef Integrated Monitoring and Reporting Program, specifically: <ul style="list-style-type: none"> <li>– facilitates adaptive management for the Reef that is effective, efficient and evolving</li> <li>– enabling timely and suitable responses by Reef managers and partners to emerging issues and risks</li> <li>– enabling the evaluation of whether the Reef 2050 Plan is on track to meet its outcomes, objectives and targets.</li> </ul> </li> <li>• Directly contributes to <b>Reef 2050 Plan Ecosystem Health action</b> (EHA5): Develop, implement and coordinate a protocol and knowledge management system for recording, storing, protection and, where appropriate, sharing of knowledge, innovations and practices; conserving and cultural use of biocultural diversity; and use in decision making. <b>Reef 2050 Plan Biodiversity action</b> (BA4): Work with Traditional Owners to build capacity to record and manage Traditional Ecological Knowledge, and prioritise research to address key Indigenous Knowledge gaps.</li> </ul> <p>Also see section 1.4 Traditional Owner Reef Protection Component.</p>

## Appendix 2.

# External parties consulted as part of the development of the Partnership Annual Work Plan

The Great Barrier Reef Foundation wishes to thank the Reef 2050 Plan Independent Expert Panel, Reef 2050 Advisory Committee, Queensland Office of the Great Barrier Reef, the Great Barrier Reef Marine Park Authority and the Australian Department of the Environment and Energy for their valuable contributions to the Reef Trust Partnership Annual Work Plan 2019-2020, provided in accordance with the Investment Strategy published in January 2019 and Annual Work Plan Consultation Plan published in August 2018.

Component	Organisation	Representatives		
<b>COTS</b>				
Working Group	GBRMPA	Mary Bonin Darren Cameron	Bruce Elliot	
	CSIRO	David Westcott		
	AIMS	Peter Doherty (independent)		
	DoEE	Kevin Gale		
	JCU	Morgan Pratchett		
General consultation	GBRMPA	Mary Bonin Darren Cameron	Kristin Dobbs Roger Beeden	Bruce Elliot
	CSIRO	David Westcott Christian Roth	Cameron Fletcher Eva Plaganyi-Lloyd	Russ Babcock
	AIMS	Peter Doherty (independent) Lyndon Llewellyn	Frederiecke Kroon Jason Doyle	Sven Uthicke
	DoEE	Trish Randell	Kevin Gale	
	JCU	Morgan Pratchett	Jon Brodie	
	UQ	Peter Mumby	Bernie Degnan	Cynthia Riginos
	QUT	Matt Dunbabin	Erin Petersen	
	USYD	Maria Byrne		
<b>RRAS (including RRAP phase)</b>				
RRAP Executive Committee	AIMS	Paul Hardisty		
	CSIRO	Peter Mayfield		
	DIIS	Jane Urquhart		
	DoEE	Deb Callister		
	UQ	Bronwyn Harch		
	JCU	Iain Gordon		
	QUT	Ian O'Hara		
	GBRMPA	Margaret Johnson		

Component	Organisation	Representatives		
RRAP Steering Committee	AIMS	Britta Schaffelke		
	CSIRO	Christian Roth		
	UQ	Peter Mumby		
	JCU	Damien Burrows		
	QUT	Mark Gibbs		
	GBRMPA	David Wachenfeld		
Project team, general consultation and reviewers	AIMS	Paul Hardisty Britta Schaffelke Manuel Gonzalez-Rivero Madeleine van Oppen Nicole Webster	David Mead Ken Anthony Carly Randall Andrew Negri	Line Bay Danielle Koopman Kate Quigley Melissa Rocker
	CSIRO	Peter Mayfield Mark Baird Jeff Dambacher Beth Fulton Michaela Cosiin Lucy Carter Marcus Barber	Christian Roth Mathieu Mongin Russel Goddard Russ Babcock Matt Curnock Aditi Mankad Kristen Maclean	Bruce Taylor E Bougeot Scott Condie Patrick Buerger Rosemary Hill Justine Lacey Chris Doropoulos
	UQ	Brent Richie Peter Mumby Dan Harris Elisa Bayraktarov M. Duarte de Paula Costa	Karen Hussey Cynthia Riginos David Callaghan Yves Marie Bozec Hawthorne Beyer	Pedro Fieldman Tom Baldock Lintje Siehoyono P. Stewart-Sinclair Kerrie Wilson
	JCU	Lisa Bostrom-Einarsson Dani Ceccarelli Stewart Lockie	Margaux Hein Maxine Newlands Damien Burrows	Ian McLeod Melusine Martin Chris Cocklin
	QUT	Karen Vella Scott Bryan	Umberto Baresi Zoran Ristovski	Mark Gibbs Kate Helmstedt
	GBRMPA	David Wachenfeld Andrew Simpson Rachel Pears	Belinda Jago Rean Gilbert	Kristin Dobbs Mark Read
	USYD	Daniel Harrison	Luke Harrison	
	UWA	R Green	Ryan Lowe	
	Worley Parsons	Peter Mellor	John Schepis	
	University of Leeds	Julia Martin-Ortega		
	ANU	Bob Costanza		
	Aurecon	Mayuran Sivapalan	Jerome Bowen	
	Reef Ecologic	Adam Smith		
	TNC	Elizabeth Shaver		
	NOAA	Tali Vardi	Tom Moore	
Smithsonian Conservation Institute	Jonathon Daly			

Component	Organisation	Representatives		
Project team, general consultation and reviewers	Southern Cross University	Peter Harrison		
	Deakin University	Eric Trembl		
	Kaust	Carlos Duante		
	New York University	Ari Patrinos		
	Imperial College	Howard Weather		
	Barrister-at-Law	Chris McGrath		
	Independent consultant	Natalie Stoeckl		
<b>Water Quality</b>				
Working Group	CSIRO	Christian Roth		
	DoEE	Kevin Gale		
	DES	Scott Robinson		
	C2O Consulting	Jane Waterhouse		
Peer Review Panel and expert reviewers	CSIRO	Graham Bonnett	Stuart Whitten	
	CQU	John Rolfe		
	Water IP	Ian Prosser		
	Independent consultant	Christine Williams		
	Independent consultant	Bob Speirs		
General consultation and value drivers	Agrihive	James Walker		
	Balkanu	Terry Piper		
	BDO	Jodie Knowlton		
	Behaviour Innovation	John Pickering		
	BRIA	Mario Barbagallo	Russ McNee	
	Burdekin Productivity Services	Rob Milla	Terry Granshaw	Sheila Charlesworth
	Canegrowers	John Eden	Kerry Latter	Matt Kealley
	Cape York NRM	John Gavin		
	Cape York Partnerships	Mike Winer		
	Central Queensland Soil Health Systems	Allan Maclean	John Sweet	
	CEFC	Melanie Madders	Nick Williams	Tracie Lines
	CQU	Owen Nevin	John Rolfe	
	CSIRO	Alice Margiolas Bruce Taylor Rebecca Bartley Toni Cannard	Andrew Ash Peter Fitch Scott Wilkinson Graham Bonnett	Anthea Cogan Peter Thorburn Stuart Whitten



Component	Organisation	Representatives		
General consultation and value drivers	DAFF	Nial Connolly	Kevin McCosker	Phillip Trendell
	DES	Dave Waters		
	Farmacist	Evan Shannon	John Markeley	Rob Slugget
	Fitzroy Basin Association	Craig Davenport	Paul Birch	
	Green Collar	James Schultz		
	Greening Australia	Hugh Wareham	Lynise Wearne	
	Griffith University	Andrew Brooks		
	Landholders	Gerry Degura Neil Farmer Tony Bujega	Joe Degura Steve Degura	Joe Muscat Steve Muscat
	Liquaforce	Cameron Liddle		
	Mackay Area Productivity Services	Andy Humphreys	David MacCallum	John Agnew
	Mackay Sugar	K Moore	Lee Blackburn (Landholder)	
	NESP	Leith Bouilly		
	NQ Dry Tropics	Andrew Yates Rob Hunt	Jared Sunderland Sam Skeat	Linda Anderson Scott Crawford
	NRME	David Whiskar	Patrick Levings	Steph Hogan
	Perpetual	Andrew Baker	Catriona Fay	
	QFF	Adam Knapp	Milena Gongora	Travis Tobin
	RCS	Adam Curcio		
	Reef Catchments	Ian Brooks	Katrina Dent	Michael Boland
	SA NoTill Farmers	Greg Butler		
	Soils for Life	Jeff Castellas		
	Sugar Research Australia	Andrew Ward	Ian McBean	Neil Fisher
	SwarmFarm Robotics	David Blower		
	Telstra	Mark Forster		
	Terrain	Carole Sweatman	Charles Hammond	Penny Scott
	Townsville City Council	Chris Manning		
	Trop Crop	David Pollock		
	TropWater	Nathan Waltham		
Turbid Water Solutions	Graeme Uechtriz			
UQ	Damian Hine			
Water IP	Ian Prosser			
Wilmar	Ian Davies	Peter Larsen		

Component	Organisation	Representatives		
General consultation and value drivers	WTSIP	Steve Roeger		
	WWF	Nick Health	Rick	Sean Hoobin
	XCS Consulting	XCS Consulting	Phillip Spradbery	
	Independent expert	Independent expert	Paul Barnett	
	Independent expert	Independent expert	John Gunn	
<b>Traditional Owner</b>				
Working Group	Traditional Owners	Larissa Hale (Yuka Baja Mulku) Malcolm Mann (Darambul)	Brian Singleton (Yirrganydji) Traceylee Forester (Lama Lama) (also AIMS employee)	
	IRAC Member	Stan Lui (also TSRA)		
General consultation and engagement	Traditional Owners	Samarla Deshong (Koinmerburra Aboriginal Corporation) Barry Hunter (Djarnda) Gavin Singleton (Yirrganydji) Alison Liddy (Lama Lama) Leroy Liddy (Lama Lama) Chrissy Grant (Eastern Kuku Yalanji) Peta Ross (Juru) Ross Williams (Juru / Bindall)	Samarla Deshong (Koinmerburra Aboriginal Corporation) Barry Hunter (Djarnda) Gavin Singleton (Yirrganydji) Alison Liddy (Lama Lama) Leroy Liddy (Lama Lama) Chrissy Grant (Eastern Kuku Yalanji) Peta Ross (Juru) Ross Williams (Juru / Bindall)	
	IRAC Members	Phil Rist (Girringun) Stan Lui (also TSRA)	Leah Talbot (Also CSIRO and IAC Member)	Duane Fraser (also RAC and IAC)
	Mandingalbay Yidinji	Dale Mundraby		
	Girringun	Phil Rist (also IRAC)		
	Wulgurukaba	Melissa George		
	IEP	Stephen Schnierer		
	DoEE	Deb Callister	Craig Moore	Miranda Robertson
	OGBR	Elisa Nichols	Matthew Fullerton	
	GBRMPA	Belinda Jago	Darren Cameron	Fred Nucifora
	Co-Design Lab	Penny Hagen		
	Healthy Families	Anaru Ah Kew	Alex Whitcombe	
	Terrain NRM	Steve Roeger		
	<b>Community</b>			
Working Group	QUT	Karen Vella		
	UQ	Angela Dean		
	Australian World Heritage Advisory Committee & RAC	Sue Sargent		
	GBRMPA	Fred Nucifora		

Component	Organisation	Representatives		
Working Group	DoEE	Patty McMahon		
	Biopixel	Richard Fitzpatrick		
General consultation and reviews	GBRMPA	Doon McColl Rebecca Allen	Megan Connell Danielle Kuhn Roger Beeden	Carolyn Roche Karen Markwort Laura Wallace
	CSIRO	Bruce Taylor	Matt Curnock	
	Australian Citizen Science Association	Erin Roger		
	Mackay Whitsunday Healthy Rivers to Reef Partnership	Emma Maxwell		
	Dry Tropics Partnership for Healthy Waters	Di Tarte		
	OGBR	Rachel D'arcy	Bernadette Hogan	Paulina Kaniewska
	Citizens of the Great Barrier Reef	Andy Ridley		
	TEQ	Azra Hadzic		
	Kiorion	Josh Gibson		
	Local Marine Advisory Committees	Cape York Cassowary Coast Bowen Burdekin Capricorn Coast	Port Douglas Hinchinbrook Whitsundays Gladstone	Cairns Townsville Mackay Burnett
	Office of the Queensland Chief Scientist	Caitlin Syme	Kylie Kraus	
	Reef Ecologic	Nathan Cook		
	UQ	Chris Roelfsema	Peter Mumby	
	Tangaroa Blue Foundation	Heidi Taylor		
<b>IMR</b>				
RIMReP Steering Group and workshops	GBRMPA	Russell Reichelt Margaret Johnson Mel Cowlshaw David Wachenfeld Laura Wallace	Fergus Molloy Dylan Horne David Leverton Camille Conaghan Roger Beeden	Jess Mead Chloe Schauble Donna Audas Michelle Dyer
	DoEE	Deb Callister	Craig Moore	
	DES	Jamie Merrick Paul Lawrence	Mark Jacobs Bernadette Hogan	Nyssa Henry Elisa Nichols
	DNRME	Ian Gordon		
	IMOS	Tim Moltmann		
	CSIRO	Christian Roth		
	BOM	Greg Stuart	Peter Stone	
	Independent Science Panel	Roger Shaw	Di Tarte	

Component	Organisation	Representatives		
RIMReP Steering Group and workshops	AIMS	Paul Hardisty Richard Brinkman	Britta Schaffelke	David Souter
	JCU	Chris Cocklin	Damien Burrows	
General consultation and reviews	GBRMPA	Russell Reichelt Margaret Johnson Mel Cowlshaw David Wachenfeld Laura Wallace	Fergus Molloy Dylan Horne David Leverton Camille Conaghan Roger Beeden	Jess Mead Chloe Schauble Donna Audas Michelle Dyer
	DoEE	Deb Callister Giles West	Craig Moore Meg Harlow	
	DES	Paul Lawrence Christian Whitte Ryan Turner	Mark Jacobs Bernadette Hogan Rainier Mann	Nyssa Henry Elisa Nichols Rachael Smith
	UQ	Peter Mumby		
	BOM	Greg Stuart Narendra Tuteja	Peter Stone	
	IMOS	Tim Moltmann		
	CSIRO	Mark Baird Christian Roth Andy Steven	Christian Roth Rebecca Bartley	Jeff Dambacher Thomas Schroeder
	Independent Science Panel	Roger Shaw	Di Tarte	
	JCU	Chris Cocklin	Damien Burrows	
	Kiorion	Josh Gibson		
	AIMS	Paul Hardisty Richard Brinkman	Britta Schaffelke Michelle Heupel	David Souter Lyndon Llewellyn Andrew Negri

## Appendix 3.

### List of investment projects committed in financial year 2018-2019

Component	Organisation	Project Name	Project Summary	Funding (\$)
Water Quality	Farmacist Pty Ltd	Extension, cane, pesticide management	This project reduces the runoff of pesticides into the Great Barrier Reef lagoon through the adoption of improved sugar cane farming practices. The project will directly engage over 70 growers, managing over 12,000 ha of land, in the catchments of Haughton, Pioneer, O'Connell Rivers, and Plane Creek identified as high priority in the Reef 2050 Water Quality Improvement Plan.	1,243,500
Water Quality	Resource Consulting Services Australia	Extension, grazing	Project Pioneer promotes the adoption of regenerative grazing operations to increase ground cover in grazing lands and reduce sediment in runoff to the Great Barrier Reef. In addition to the improved water quality entering the waters of the Great Barrier Reef, other environmental outcomes include reduction in carbon loss from soils, increased biodiversity on-farm, particularly soil and aquatic life, and increased landscape resilience to the effects of climate change.	2,899,500
Water Quality	Greening Australia	Gully restoration	This project aims to reduce the amount of sediment discharging to the Great Barrier Reef lagoon by approximately 3,200 tons per annum through remediation of alluvial gullies by using established techniques. In addition, the project will aim to pilot the Reef Credit system and investigate how Reef Credits could be used to fund gully remediation works and ongoing maintenance requirements.	2,092,040
Water Quality	Sugar Research Australia	Cane to Creek 2.0 – Extension, cane	Works on farm with small cane grower groups to address nitrogen and pesticides. The program breaks down the barriers between scientists and growers, maximises peer-to-peer learning opportunities and improves understanding of the drivers of water quality impacts.	2,226,806
Water Quality	Catchment Solutions Pty Ltd	Project Catalyst – Extension, cane, soil testing & nutrient management plans	Supports a network of cane farmers in the Reef catchments to improve farming practices to reduce nutrient run off to the Reef. This is achieved by focusing on soil testing, nutrient management plans and implementation of controlled traffic management systems (reducing soil compaction by confining heavy machinery to permanent traffic lanes). This phase of the project will engage new farmers and continue to work with previously engaged cane farmers in Mackay Whitsunday, Burdekin and Wet Tropics.	2,407,751
Water Quality	Qld Cane Growers Organisation Ltd	Behaviour change, cane	This behaviour change program uses co-design principals to elicit improved practises through accreditation in the SmartCane Best Management Program and other forms of 'commitment' towards improved practices. This phase of the project will build on the existing program in the Wet Tropics and initiate new programs in Mackay, Burdekin and Southern Regions.	1,413,500
Water Quality	NQ Dry Tropics	Reefwise Grazing of Burdekin Rangelands – Extension, grazing	This project will produce dedicated and specific education, training, capacity building and incentives that will take 12 grazing landholders on a progressive journey towards techniques that proactively manage stock grazing pressure and minimise potential for declining land condition leading to reduced sediment runoff. The project will also result in a further 50 landholders using increased knowledge and skills to apply management changes to improve the quality of water discharged from their property.	659,984

Component	Organisation	Project Name	Project Summary	Funding (\$)
Water Quality	BRIA Irrigators	Extension, cane, irrigation	Farmer (cane) led project which raises awareness and drives practice change through improved fertiliser application, modifying pesticide type and quantity and improving irrigation efficiency.	900,520
Water Quality	Mary River Catchment Coordinating Committee	Gully restoration, grazing	Addresses sediment discharge to the Great Barrier Reef lagoon through gully restoration on grazing land. The project will also work with graziers to increase awareness and actively manage lands that are susceptible to erosion through the adoption of best land management practices.	646,500
Water Quality	Qld Farmers Federation 2	Early Career Extension Officers – Training extension staff	This project will increase the delivery capacity related to agronomic extension by training early career extension officers (agricultural experts) in practices relevant to addressing sediment, nitrogen and pesticide runoff. The project will involve a 12-month placement of up to eight early career extension officers within various organisations in reef catchments, to increase capacity to support land management practice change.	1,258,768
Water Quality	Qld Farmers Federation 1	Reef Alliance Project 2 – Extension, cane/ grazing	Supports cane farmers and graziers by using one-to-one agricultural experts (extension officers) to move 462 land holders, covering 209,750 ha, towards best practice to reduce sediment, nitrogen and pesticides.	3,500,000
RRAS	AIMS	Coral spawning project	This project focused on developing methods to fast-track knowledge to breed, settle and field deploy corals required for restoration at scale. The team focused on a select number of species, which were spawned, fertilised and reared in the National Sea Simulator at AIMS. A number of different settlement devices were trialled and settled coral larvae have been deployed on the reef, where survival rates are being monitored.	900,000
RRAS	AIMS	Coral bleaching processes project	Leading up to summer 2018/2019, NOAA and the Bureau of Meteorology issued warnings for a third consecutive mass bleaching occurring due to predicted weather conditions. In response to this, a field project was designed to collect much needed data on factors impacting survival or mortality rates during a natural bleaching event. As weather conditions improved during the summer months, the risk was downgraded and the project did not progress to the field stage.	1,233,003
RRAS	UQ	RRAP – Restoration regulation	This project is funding a small team to focus on developing hypothetical use cases for regulatory and permitting planning for the RRAS program. The program will furthermore develop a framework for systematically evaluating the regulatory evaluation process itself.	142,000
Community Reef Protection – Citizen science	QUT	Combining Citizen Science and innovative technologies to enhance reef management	Develop a cloud-based image platform, Virtual Reef Diver, and integrate with the existing Eye on the Reef app to enable the upload of underwater and classification of images showing the seafloor. This close an adaptive management loop by enabling data to be analysed together and deliver predictive maps that can be downloaded and summarised to facilitate, local, regional, and GBR scale reporting that are accessible to reef communities.	100,000
Community Reef Protection – Citizen science	EarthWatch Institute	Protecting wetlands for the future	This project will support teacher training, student engagement and curriculum materials to help to deliver a framework for a standardised school-based Mangrove Watch monitoring program. Data can inform local mangrove management and conservation.	93,030
Community Reef Protection – Citizen science	James Cook University	Extending the success of REDMAP Australia to Queensland	The project seeks to inform, engage and educate fishers, divers, boaters and the general public about marine species that are shifting southwards with warming waters. Program ambassadors will be trained along the coast to engage with SCUBA, snorkelling and fishing organisations to help communities report on unusual sightings and track key species.	91,883

Component	Organisation	Project Name	Project Summary	Funding (\$)
Community Reef Protection – Citizen science	Science Under Sail	Building understanding through participation in seagrass mapping and data visualisation	This project works to address a knowledge gap in seagrass spatial extent by training high schools students along the coast to collect and share rapid spatial assessments of seagrass.	99,100
Community Reef Protection – Citizen science	Reef Teach	Great Barrier Reef health monitoring and training project	This project will train tourism operators to undertake georeferenced photo sections as an expanded activity for GBRMPA's Eye on The Reef program. It will engage a minimum of eight local operators and provide a replicable model for other regions. This will also include trialling and implementing explores models for engaging guests in activities, including internship programs and Master Reef Guide led programs for visitors.	85,052
Community Reef Protection – Citizen science	CoralWatch, UQ	Educating communities to help ACT and PROTECT our GBR	CoralWatch will partner with Environmental Education Centres to develop reef citizen science materials tailored to the coastal areas of Palm Island, North Keppel Island, Gladstone and Heron Island. This will include curriculum linked lesson plans, coral identification sheets, virtual reef posters and display material for EEC's and other suitable venues, as well as field-based data collection activities.	99,205
Community Reef Protection – Citizen science	Lady Musgrave Reef Custodians	Reef Guardians for Generations	This project will build a collaborative model for citizen science at Lady Musgrave working with local Traditional Owners, schools, Reef managers and community groups to collect Reef health data through CoralWatch and Eye on the Reef programs.	30,370
Community Reef Protection – Citizen science	Reef Ecologic	Integrated coral reef citizen science	This project aims to integrate existing citizen science organisations and complementary reef monitoring projects in the Townsville region (Eye on the Reef, Reef Check, Coral Watch, Reef Recovery, Earth Watch, Virtual Reef Diver) and increase collaboration between multiple reef citizen science organisations to deliver a broader suite of not only ecological, but also socio-economic information from their monitoring activities.	85,000
Community Reef Protection – Citizen science	Reef Check Australia	Whitsunday reef monitoring for long-term health	Reef Check Australia will continue collecting reef health data on long-term sites in the Whitsundays region, as well as working with project partners to expand the number of volunteers engaged in GBRMPA Reef Health and Impact Survey (RHIS) methods. The project will also train the first cohort of Reef Ambassadors as enthusiastic community leaders looking to promote information about the condition of our coral reefs and what communities can do to help.	77,742
Community Reef Protection – Citizen science	Reef Catchments and Whitsunday Charter Boat Industry Association	Whitsunday Water Quality Monitoring Blue Print for Tourism Operators	Training of tourism operators to build on water quality monitoring at key tourism locations. The project will collaboratively develop a framework for connecting citizen science the regional report card partnership.	82,051
Community Reef Protection – Citizen science	Turtle Care Volunteers QLD Inc	Wreck Rock Turtle Monitoring Project	Wreck Rock Beach is only one of two areas in the South Pacific region that produces predominately female turtle hatchlings, this is an issue for the survival of the species. Turtle Care Volunteers Queensland Inc. will engage volunteers to monitor population information provided to land managers to implement response strategies to mitigate the negative impacts of climate and weather factors and other threats such as predation, with the goal to increase in the numbers of hatchlings from this site.	55,372

Component	Organisation	Project Name	Project Summary	Funding (\$)
Community Reef Protection – Citizen science	Fitzroy Basin Association	Team Turtle CQ	The Team Turtle CQ Project aims to empower community volunteers to participate in citizen science, recording data on nesting marine turtles along the Capricorn and Curtis coasts of Central Queensland. Project data is used to inform a behaviour change campaign to help implement onground action to protect nesting beaches and reduce impacts threatening local turtles.	65,000
Community Reef Protection – Citizen science	Gidarjil Development Corporation Ltd	Community Caring for Sea Country: Seagrass	Led by the Gidarjil Land and Sea rangers, with guidance and participation from Elders of the Port Curtis Coral Coast (PCCC) region, this project will address a significant knowledge gap in the condition and health of seagrass and saltmarsh in Bustard Bay. Traditional Owners, youth and community members will join field-based training and data collection activities to establish and monitor local seagrass using the Seagrass Watch.	55,000
Community Reef Protection – Citizen science	Great Barrier Reef Legacy	Amplifying Reef Citizen Science	A new model for place-based citizen science data integration and reporting will be piloted, with potential opportunities for scaling to other locations. This project will demonstrate how multiple citizen science datasets can be collected and combined for three sites (inshore, offshore, midshelf) to improve model estimates and predictive performance of Reef health and reported using a central platform.	97,750
Community Reef Protection – Citizen science	Cairns and Far North Environment Centre (CAFNEC)	Cairns and Far North Queensland MangroveWatch	This project will enhance existing MangroveWatch monitoring by facilitating citizen science tidal wetland data collection on ecosystem condition in seven estuaries within the Wet Tropics and Southern Cape York region. The project scales previously established MangroveWatch methods in new locations and demonstrated connectivity across multiple sites and land to sea connections.	99,320
Community Reef Protection – LMAC	Flying Fish Point State School	Flying Fish Point State School Billabong	This project will upgrade the open channel that borders the Flying Fish Point State School to a functioning billabong. This unique partnership will improve stormwater quality flowing from the catchment to the Reef while educating the next generation by incorporating wetland management into the school's curriculum.	15,000
Community Reef Protection – LMAC	Conservation Volunteers Australia	Townsville Urban Marine Debris Strategy Development	The project aims to identify and reduce land-based sources of marine debris, create relevant engagement and educational materials for the whole Reef catchment and recommend cost effective local actions to reduce litter entering the marine environment.	15,000
Community Reef Protection – LMAC	Whitsunday Regional Council	Restoration of Twin Creek	The project will see a section of a degraded urban creek system replanted with native species. This aims to increase the roughness within the waterway and bind sediments, to slow water flow and reduce erosion.	14,973
Community Reef Protection – LMAC	Reef Catchments Ltd	What a load of rubbish! Sorting out its source	Gross Pollutant Traps (GPTs) throughout Mackay have been audited to identify hotspot areas, or areas where a particular item (e.g. cigarettes) are abundant. This project will use this data to approach businesses in hot spot locations to implement source-reduction plans and pilot projects. Five GPTs will also be installed in high pollutant areas throughout the Mackay region to further reduce debris entering the ocean.	14,800
Community Reef Protection – LMAC	Fitzroy Basin Association	What's down our drains?	This project will see Drain Buddies installed into river litter hotspot areas that will enable the litter types to be analysed. This data will be used to identify what item/s to target in a behaviour change and source reduction project.	30,000



Component	Organisation	Project Name	Project Summary	Funding (\$)
Community Reef Protection – LMAC	Bundaberg Fruit and Vegetable Growers	#LessisMore – Seeding behaviour change in the Bundaberg community	The #LessisMore pilot project will initiate positive behaviour change for the Great Barrier Reef within the Bundaberg community. The three simple actions it will focus on are: targeting single use plastics for primary schools by teaching students how to make beeswax wraps, encouraging smokers to ‘vote for the Reef’ by placing their butt in a bin and reducing the amount of plastic straws with a paper for plastic straw replacement program for local cafes and school tuckshops.	15,000
Community Reef Protection – LMAC	South Cape York Catchments	Creating sensitive visitors to the Great Barrier Reef Northern Region	Working with local Traditional Owners, scientists, community members and school students, this project will create an inspiring guide to visiting and using the Great Barrier Reef Marine Park, without damaging it. This guide will be a Call-To-Action to excite tourists and locals into doing their bit to protect the Great Barrier Reef.	15,000
Community Reef Protection – LMAC	Port Douglas Daintree Tourism Ltd	Inspiring steps towards a sustainable Shire	The project will create a series of vignettes showcasing leaders in the region who are improving water quality by implementing change into their everyday work practises across agriculture, tourism and community development. This will put a spotlight on what can be done in the community and create a practical guide to inspire change in business practices throughout the Douglas Shire and beyond.	15,000
Community Reef Protection – LMAC	Cairns and Far North Environment Centre (CAFNEC)	Warriors of the Waterways – A unifying story	Healthy creeks lead to healthy reefs, this project will use a grassroots campaign to celebrate current and initiate community-powered waterway health initiatives in Cairns.	14,960
Community Reef Protection – LMAC	Bowen Tourism and Business	Leaving no footprints	This Reef education program aims to educate visitors and locals in the region about the importance of the local reef and marine life and how to enjoy accessible local reefs without impacting the environment, or leaving any footprints behind.	13,050
Traditional Owner Reef Protection	Wuthathi Aboriginal Corporation (focus area 2)	Wuthathi Rangers Caring for Land and Sea	The Wuthathi Rangers Caring for Land and Sea Project will enhance the provision of ranger services to the Shelburn Bay and Lockhart River area. Traditional Owners have worked with researchers to demonstrate that Shelburn Bay is a unique landscape of high ecological and cultural importance, and rangers will work closely with Wuthathi Traditional Owners to manage their land and sea.	150,000
Traditional Owner Reef Protection	Gidarjil Development Corporation Ltd (focus area 3)	Gidarjil Cadet and Junior Ranger Program – PCCC Future Makers	The Gidarjil Cadet and Junior Ranger Program will establish a “Cadet” Ranger Program aimed at junior secondary school students that have graduated from the established Junior Ranger Program. Cadets will collaborate with Indigenous rangers from the Gidarjil Caring for Country (CFC) and Land & Sea Rangers (BLSR) on key environmental activities carried out during three and five-day camps.  The project aims for collaborative management and monitoring by “cadet rangers” of sea-grass meadows, salt-marshes, fox predation of turtle nests, burns of coastal vegetation and acquisition of traditional knowledge through cultural immersion camps between Rodd’s Peninsula and Baffle Creek.	50,000
Traditional Owner Reef Protection	Mandubarra Aboriginal Land & Sea Inc	Mandubarra Junior Ranger Project	The Mandubarra Junior Ranger Project will establish a strategy and protocols for who, how, when and why cultural knowledge is shared. Through the development of educational tools and delivery of camps and other events, Mandubarra elders will share traditional wisdom and culture, transferring knowledge to young Traditional Owners and increasing awareness and respect of Mandubarra culture amongst the wider community.	50,000

Component	Organisation	Project Name	Project Summary	Funding (\$)
Traditional Owner Reef Protection	Jabalbina Aboriginal Corporation	Jabalbina Daintree Coast, Reef and Islands Management Plan	This project will develop governance arrangements, management protocols and strategies to close gaps in effective management of Jabalbina Sea Country. As healthy sea country underpins livelihoods in land and sea management and tourism industries, the plan will also create a framework to create further employment and business opportunities for local communities.	150,000
Traditional Owner Reef Protection	Gidarjil Development Corporation & PCCC (focus area 2)	Belbendimin Wulgun Djau (Caring for Sea Country): building the resilience of coral and oyster reefs	This project aligns with the vision and objectives of the PCCC Sea Country Management Plan 2019–2025 and addresses the priorities of the PCCC TUMRA (Traditional Use of Marine Resources Agreement) which describes how Traditional Owners manage their sea resources within the Great Barrier Reef Marine Park. The project will address the major knowledge gaps that exist regarding in-shore coral reefs, oyster reefs and water quality in the southern GBR.	100,000
Traditional Owner Reef Protection	Girringun Aboriginal Corporation (GAC) (focus area 3)	Girringun Junior Ranger Camp	The Girringun Junior Ranger Camp will bring together Elders and rangers to share cultural knowledge of Girringun Sea Country to young people across the nine Traditional Owner groups that Girringun Aboriginal Corporation represents. This project presents an opportunity to maintain and preserve cultural practices, and way of life, in a way that meaningfully engages young people and strengthens their traditional knowledge and sense of belonging to community.	50,000
Traditional Owner Reef Protection	Yuku Baja Muliku Landowner & Reserves Ltd (focus area 2)	YBM Annan River and coast line critical values and habitats: healthy waters for our people	This project is about establishing long-term monitoring programs which collect scientific and critical cultural information across many different areas including water quality, fish communities, mangroves, key cultural species and impacts such as pollution, plastics and marine debris on Yuku Baja Muliku Country.  This will facilitate formal opportunities for Traditional Owners, scientists and NRM managers to work together to collect and record data and for everyone to look at data analysis together so that YBM Traditional Owners can make informed decisions about how to best look after their Country.	150,000
Traditional Owner Reef Protection	Wuthathi Aboriginal Corporation (focus area 3)	Wuthathi Caring and Connecting with Land & Culture	This project will establish a Junior Ranger Program that coincides with school holidays and is based on visits to Wuthathi Country adjacent to and on Shelburn Bay. The program will reconnect youth to their culture through caring for their land using traditional and scientific approaches and on-going mentoring that will equip participants to be future leaders.	50,000
Traditional Owner Reef Protection	Dawul Wuru Aboriginal Corporation (focus area 3)	Yirrganydji Junior Ranger Program – Empowering Today’s Generation for Tomorrow’s Future	The Yirraganyji Junior Ranger Program will improve general understanding and highlight any pressures impacting Yirrganydji Country, as well as encourage behaviour change while providing an engaging way for local children (both Indigenous and non-Indigenous) to learn about looking after Country today and into the future. The program will be developed in partnership with schools in the Cairns and Port Douglas area, complementing the Australian STEM curriculum with Aboriginal and Torres Strait Islander Histories and Cultures, embedding the culture and knowledge of Yirrganydji people within environmental education programs.	50,000
Traditional Owner Reef Protection	Girringun Aboriginal Corporation (GAC) (focus area 2)	Girringun Maritime Project	This project will provide support for rangers to undertake training with an Indigenous Maritime Training Company to obtain formal maritime qualifications in Deckhand and Coxswains certificates. These qualifications will enhance the ability of rangers to look after their vast areas of sea country.	150,000
Traditional Owner Reef Protection	Yuku Baja Muliku Landowner & Reserves Ltd (focus area 3)	Yuku-Baja-Muliku Junior Ranger Project	A full-time Junior ranger co-ordinator will be funded to operate and expand the existing successful program that is currently run in Cooktown. The YBM Junior Ranger Program runs weekly after school and has been supported and run by YBM Indigenous rangers in the past. With a dedicated project officer in place, the program can be expanded, and many more environmental and cultural extension activities can be designed and delivered. In addition to the junior ranger program, the coordinator will be able to drive the establishment of the YBM Cadet Ranger Program for high school aged students.	50,000

Component	Organisation	Project Name	Project Summary	Funding (\$)
Traditional Owner Reef Protection	Balkanu Cape York Development Corp	Dabu Jajikal Land and Sea Country Planning Project	Development of a sea country plan by Traditional Owners in partnership with other stakeholders. The sea country plan will be developed through a series of on-country meetings and workshops and will culminate in the production of a plan in the form of a book, video and audio recordings. Future workshops will also be planned to ensure commitments made during the initial phases are acted on.	149,400
Traditional Owner Reef Protection	Juru Enterprises	Juru Land and Sea Country Planning Project	The Juru people want to protect all heritage areas whilst maintaining, developing and strengthening the culture and heritage values and Lores of the Juru peoples. A management plan will be created by identifying, collating and reviewing existing information, reports, data and knowledge of heritage areas within the project site. This will be the foundation for Traditional Owners to develop and sustain strong partnerships with Government and NGOs to protect Country and the marine estate. The project will provide a platform for Traditional Owners to discuss and document their aspirations for management of their Country.	87,798
Traditional Owner Reef Protection	Radiant Life College	Goondoi Junior Rangers Program	The Goondoi Junior Rangers Program will provide opportunities for elders to spend time with young ones to pass on cultural knowledge about their country. This will be done through school-based activities and camps.	49,400
Traditional Owner Reef Protection	Dawul Wuru Aboriginal Corporation (focus area 2)	Implementing Yirrganydji Sea Country Plan - Empowering Today's Generation for Tomorrow's Future	This project will take the next step in Yirrganydji's management journey and establish a clear pathway for the future management of the ecological and cultural values and aspirations set out in their community endorsed Sea Country Plan. This includes activities such as: establishing a Yirrganydji 'Keeping Place' to preserve, protect, and promote traditional knowledge, developing a Yirrganydji cultural heritage policy, and a cultural landscape atlas that maps biocultural values and knowledge.	150,000
Traditional Owner Reef Protection	Djarnda Enterprises	Wulgurukaba Land & Sea Country Renewal and Planning	The project supports the Wulgurukaba Traditional Owners to revisit their existing Sea Country Plan in order to address gaps and establish baselines relating to resources. The area of sea country for which the plan is being renewed is the subject of significant development pressure making an updated Sea Country Plan important for the management of the area.	125,000
Traditional Owner Reef Protection	Ipima Ikaya Aboriginal Corporation	Cape York Great Barrier Reef Sea Country Management Plan	A country-based plan will be developed by the two Traditional Owner clans with cultural authority for the Northern Peninsular Area of Cape York, Great Barrier Reef. This project will greatly assist the Traditional Owners to develop a coordinated approach to the management of their sea country areas and to apply community authorised strategies that look to address natural resource management and sustainable use.	147,163
Traditional Owner Reef Protection	South Cape York Catchments	Healthy Country Planning for Normanby Station	Normanby Station is situated in the heart of the fourth largest Great Barrier Reef river catchment. This project will see a Country plan created that will guide future land management practices, stakeholder investment and business enterprises whilst ensuring compatibility with customary obligations. This project links cultural values and natural values.	100,000
IMR	AIMS	Northern Great Barrier Reef Monitoring	Following two consecutive mass coral bleaching events in 2016/17 and 2017/18, and with a high risk of a third event occurring during the 2018/19 summer, reef scientist and managers flagged the need to follow up on surveys in the far north GBR to assess the status of those reefs. The AIMS Long Term Monitoring Team (LTMP), the principal Government agent to conduct long term coral reef surveys, were provided with additional funding to allow them to partner with James Cook University, and to use this opportunity to trial some novel survey methods which are being considered under the Reef Integrate Monitoring and Reporting Program. AIMS provided significant co-investment from the LTMP.	574,000

# Appendix 4. Program logics for individual Partnership Components

## Water Quality Component – Program logic

