Noosa River Oyster Ecosystem Restoration Project

Restoration of critically endangered oyster ecosystems in the Noosa River estuary

Annual Report No. 1

Reporting Period: July 2019 to August 2020

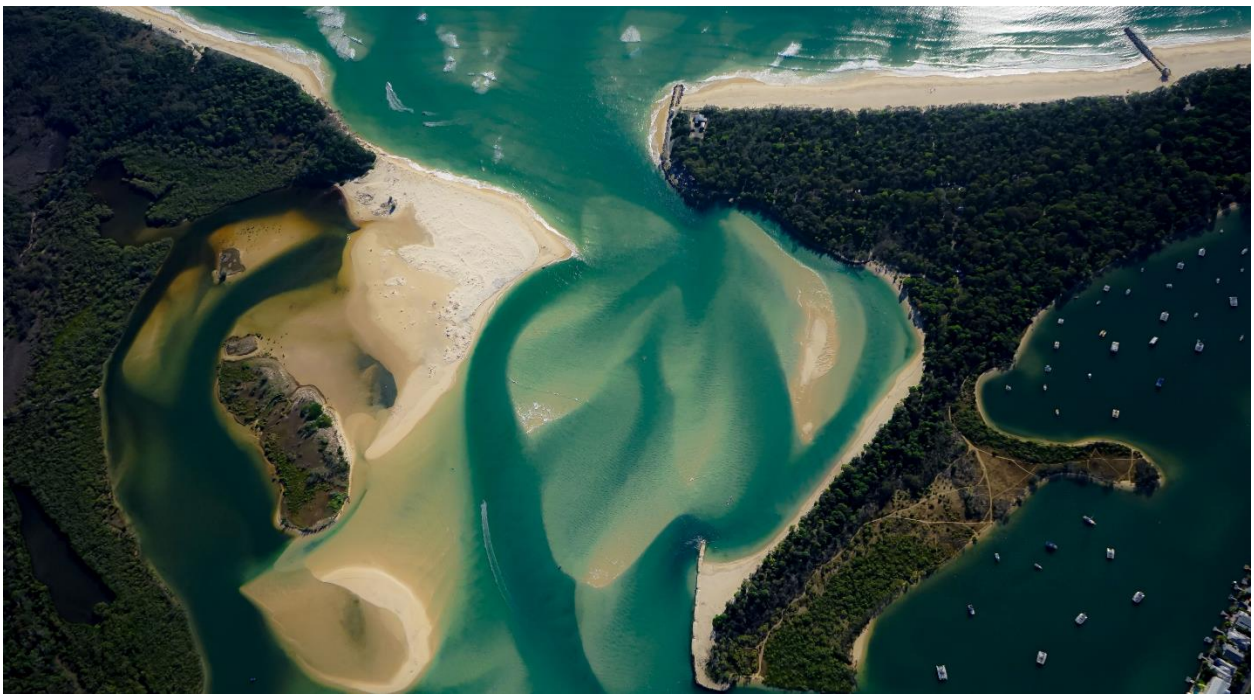

Figure 1. Mouth of the Noosa River estuary (© Marcos Barboza)

This project was made possible by The Nature Conservancy, Noosa Shire Council, The Thomas Foundation and Australian Marine Conservation Society. The project is located on Kabi Kabi Sea Country.

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Version/Date	Issued as	Author	Approved
V1	For TNC and NSC review	TNC	19.08.2020
V2	CD review	CD	26/08/2020
V3	For submission	TNC	31/08/2020

Purpose and scope

The purpose of this report is to provide readers with insight as to the performance of the Noosa Oyster Ecosystem Restoration Project (the "Project"). The governance arrangements for the Project are defined in the *Alliance and Funding Agreement* between The Nature Conservancy and Noosa Shire Council, which was executed on the 25th July 2019. This report (Annual Report 1) pertains to the period 25th of July 2019 and 21st of August 2020.

Background

Over the last four years, Noosa Shire Council (NSC), The Nature Conservancy (TNC) and a range of stakeholders have worked together to build a deeper understanding of the environmental significance and long-term sustainable management options for the Noosa River. This has included:

Noosa River Expert Workshop, Powerhouse Museum, 2014

A two-day workshop, hosted by TNC on behalf of The Thomas Foundation and Noosa Parks Association, comprising 12 academic and NGO estuary scientists. The workshop identified 14 conservation activities that could lead to a healthier Noosa River, with oyster reef restoration listed as a priority action in addition to prawn restocking and Kin Kin sediment management. These activities (including further scoping studies) were later jointly funded by NSC, Noosa Parks Association, The Thomas Foundation and the Noosa Biosphere Reserve Foundation.

TNC Oyster Restoration Scoping Study, 2015

TNC and Ecological Service Professionals Pty on behalf of NSC and others undertook a short, five month ecological assessment to quantify oyster densities across 11 intertidal and subtidal sites within the estuary. The study confirmed high densities of oyster recruitment particularly around Weyba Creek, the main channel around Tewantin, and in the narrow channel between Goat Island and Noosa North Shore. The project recommended installing a number of pilot reefs for further assessment.

University of Queensland Historical Ecology of the Noosa Estuary fisheries, 2015

Ruth Thurston from the University of Queensland undertook a historical ecology study on behalf of TNC and NSC in the Noosa River estuary to develop an understanding of historical fisheries productivity, including oysters. The study confirmed oyster reefs used to exist in the estuary and were commercial harvested in the early 1900s. Fish populations were also significantly larger in the past than they are today.

University of Sunshine Coast, Bring Back the Fish, 2018-2020

A three-year study which installed a series of experimental 'oyster habitat restoration units' consisting of coir bags filled with oyster shell at 14 sites across the estuary. The project studied the structural integrity of the units, oyster recruitment, fish and invertebrate community assemblages and human interactions with the trail reefs. This project collected important ecological information that will support the final design and implementation of reef restoration in this Project.

NSC-TNC Partnership Agreement 2019

NSC and TNC, in addition to other organizations with an interest in the River's sustainability (including Noosa Parks Association, The Thomas Foundation and Noosa Biosphere Reserve Foundation), through a series of dialogue and presentations to Noosa Shire Council, have recognized the strategic priorities of both organizations and of others would be more effectively served through a formal partnership, rather than on an individual project basis. This led to the development of *this* Project, and associated partnership agreement between NSC and TNC, and is the main delivery mechanism of the TNC-NSC Partnership.

Draft Noosa River Plan, 2020

The completion of the Noosa River Plan by NSC will identify current and future threats and management interventions to abate identified threats within the Noosa River estuary. The Plan will identify the strategic alignment of oyster reef

restoration to the long-term health and resilience of the Noosa River estuary. The Noosa River Plan will support the delivery of the Noosa Environment Strategy.

TNC Project Management Plan 2020
The TNC Project Management Plan including Communications Plan and Monitoring, Evaluation and Reporting (MER) Plan were presented to Noosa Shire Council at its Ordinary Meeting, 16th July 2020.

Project overview

Past research projects demonstrated that the Noosa River estuary has sufficient oyster recruitment and survival, and invertebrate colonization, at a number of locations to make the estuary a viable place to pursue an oyster ecosystem restoration project at scale.

The primary goal of the Project is to restore functionally extinct oyster-dominated ecosystems (beds and reefs) and other associated oyster species, in the Noosa River estuary. These ecosystems benefit nature and people.

Historically, oyster ecosystems were prolific throughout the Noosa River estuary. They were created predominantly by rock oysters (such as *Saccostrea glomerata*), which, in association with other oyster species, formed three-dimensional 'natural infrastructures' in the river, either forming 'beds' of low relief or 'reefs' of high relief. Oyster ecosystems provide valuable fish habitat and substantial ecological services to coastal ecosystems (Peterson et al 2003; Beck et al 2011; Grabowski et al 2012). Oysters are ecosystem engineer species capable of improve ecosystem function and providing habitat for other organisms (Grabowski et al 2012).

Oyster ecosystems thus added extensive 'natural infrastructure' to the estuary and provided the estuary with a range of environmental functions. These included providing complex habitats for marine species (the diverse habitats typically consist of fish, invertebrates, corals, ascidians, lace corals, encrusting sponges and algae); filtering water and removing suspended sediment and pollution; processing nutrients; providing bank stabilization and protection; and, providing complex vertical and horizontal living spaces, and feeding grounds, for a multitude of intertidal and marine creatures, which are today important for marine and coastal lifestyle and tourism activities such as fishing, diving and bird watching.

The recognition of the significant contribution of oyster ecosystems led to their recognition as an important wetland habitat type in the Convention on Wetlands of International Importance (The Ramsar Convention – habitat type 'Ga') (Kasoar et al. 2015).

Key related references include:

Kasoar T, zu Ermgassen PS, Carranza A, Hancock B, & Spalding M. 2015. New opportunities for conservation of a threatened biogenic habitat: a worldwide assessment of knowledge on bivalve-reef representation in marine and coastal Ramsar Sites. Marine and Freshwater Research. http://dx.doi.org/10.1071/MF14306

Peterson CH, Grabowski JH, & Powers SP. 2003. Estimated enhancement of fish production resulting from restoring oyster reef habitat: quantitative valuation. Marine Ecology Progress Series 264, 249–264. doi:10.3354/MEPS264249

Grabowski JH, Brumbaugh RD, Conrad RF, Keeler AG, Opaluch JJ, Peterson CH, Piehler MF, Powers SP, & Smyth AR. 2012. Economic valuation of ecosystem services provided by oyster reefs. Bioscience 62, 900–909. doi:10.1525/BIO.2012.62.10.10

Beck MW, Brumbaugh RD, Airoldi L, Carranza A, Coen LD, Crawford C, Defeo O, Edgar GJ, Hancock B, Kay MC, Lenihan HS, Luckenbach MW, Toropova CL, Zhang G, & Guo X. 2011. Oyster reefs at risk and recommendations for conservation, restoration, and management. Bioscience 61, 107–116. doi:10.1525/BIO.2011.61.2.5

Project governance

The Project is framed by a formal partnership agreement between TNC and NSC. This partnership is specified in the *Alliance and Funding Agreement*, which came into effect on 25th July 2019. The agreement is effective for three years and two months and the project is scheduled to be completed by 30th September 2022. The terms of the partnership will be reviewed prior to July 2022.

The Project is overseen by an executive level forum comprising two key Contact Officers, those being the Director of Oceans (TNC) and Director of Environment & Sustainable Development (NSC). The governance of the activities for the project are the responsibility of the Executives of TNC and NSC, or their nominated delegate/s and day-to-day operations the responsibility of TNC and its appointed Project Manager for that purpose.

The Project Manager is supported by the Noosa Technical Advisory Group (TAG), formed for the Project. The TAG's purpose is to:

- Support detailed project planning for the *Noosa Oyster Reef Restoration Project* that will see reefs re-established in the Noosa River estuary by June 2022.
- Provide ongoing expert advice on the implementation of the Project Plan, and support in overcoming legislative, scientific and practical barriers that occur during the term of the project.
- Ensure that the Project meets all technical, statutory and policy requirements in a timely manner to the satisfaction of relevant decision-making authorities.
- Ensure actions within the Project Plan are effectively delivered and communicated to all stakeholders.

The composition of the Noosa TAG is:

- The Nature Conservancy – Oceans Operations Manager + Oceans Restoration Scientist
- Noosa Shire Council – Environmental Services Manager
- Department of Environment & Science - Water quality and aquatic ecosystems expertise
- Department of Agriculture & Fisheries - Fisheries, permits and biosecurity expertise
- Maritime Safety Queensland - Regional Manager and Noosa local officer (on occasion)
- Kabi Kabi Traditional Owner – For technical expertise
- Independent aquatic ecologist/biologist – With in depth ecological knowledge of the Noosa River estuary

The Noosa TAG held its inaugural meeting on the 15th May 2020. The second TAG meeting was held on the 20th August 2020. TAG meetings are held on a semi-regular basis, as required to drive the project forward. Specific matters are often addressed out of session. Minutes from TAG meetings are produced and made available on request.

Project resourcing

The total operating budget for the project is $2.4M, inclusive of $1.2M from The Nature Conservancy (TNC), which includes $200,000 from the Australian Marine Conservation Society (AMCS), and $1.2M from NSC. There is an expectation that TNC will raise further funding, from a variety of other sources, to support further delivery of the restoration component of the project.

Conservation deliverables

The Project principally delivers the following:

1. Restoration of Noosa's oyster ecosystems at practical and agreed locations;
2. Engagement of the Noosa community and local businesses in meaningful volunteering and marine education opportunities;
3. Exploration of the potential to restore seagrass habitats in Lake Cooroibah (and potentially elsewhere) to reduce sediment resuspension and increase invertebrate and fish biomass in the estuary (to be delivered as part of Objective two and five); and,
4. Provision of technical advice to Noosa Shire Council (NSC) in identifying opportunities for sustainable commercial and recreational fisheries in the Noosa River.

Work sequence

The Project comprises three work stages, to reduce ecological and financial risks through the application of an adaptive management framework whereby learnings from previous phases are included in future stages to consider prior learning and minimize risk:

1. *Optimal design and siting* (2020) which includes pre-planning to determine the optimal design, locations and most cost effective method of reef restoration;

2. *First site implementation* (2020-2021) which seeks to restore oyster beds at two pilot sites; and,

3. *Full restoration* (2021-2022) where additional oyster beds are restored at additional sites.

Summary of Achievements to Date

Considerable progress has been made in the first year of the partnership. Despite delays with the appointment of a dedicated project manager and numerous challenges imposed by COVID-19 restrictions (as well as impacts on individuals, families and businesses), the project has still managed to achieve the following key results in its first year of operation.

- Appointment of a Project Manager for the project, Craig Bohm, who commenced work on the 29th of January 2020, and is based in Noosa.
- Developed the Project Management Plan (also called 'Implementation Plan').
- Developed the Noosa Risk Assessment, Communications Plan and Monitoring, Evaluation and Reporting (MER) Plan.
- Secured endorsement of the Project Management Plan, and associated plans, from the newly elected Noosa Council.
- Completed preliminary field assessments (baseline surveys) of potential restoration sites in the Noosa River estuary.
- Completed extensive data reviews and developed the Noosa Habitat Suitability Model and Noosa Restoration Suitability Model;
- Completed site visits and preliminary assessment for the Noosa 'Shuck Don't Chuck' oyster shell recycling project.
- Established Shuck Don't Chuck program with new project partners Mooloolaba River Fisheries (MRF) and Resource Recover Australia (RRA).
- Provided input to, as well as three expert reviews of the draft *Noosa River Plan.*
- Facilitated two media statements and secured positive media profiling in the local press (see: *Media* section).

- Facilitated a major scientific literature review and publication of results regarding the history of oyster reefs in South East Queensland.
- Completed two *Enviroforum* seminars (Dr Chris Gillies, Dr Hugh Possingham) for Noosa Parks Association members and guests. Dr Chris Gillies also presented to the community at the Noosa Shire Council.
- Contracted Ecological Service Professionals (ESP) to map all seagrass beds in the Noosa River estuary as well as to develop detailed habitat maps for potential oyster ecosystem restoration sites.
- Held two 'meetings of the Noosa Technical Advisory Group (TAG).
- Identified key (initial) community partners.
- Held consultation meetings with more than 67 key stakeholders and strengthened relationships with each of these wherever possible.
- Provided communications content to Tourism Noosa.
- Commenced scoping of the Noosa oyster gardening project, which will be a major community engagement vehicle.

Total progress against agreed deliverables

Table 1 presents the total progress of the project against the deliverables as outlined in the Alliance and Funding Agreement Schedule 1.

Table 1: Total progress of the project against the deliverables

Deliverables	Measurable outcomes	Timeframe	Progress	Total progress to date and notes
(A1.1) A Technical Advisory Group (TAG) is established to provide project oversight. This will include a clear terms of reference (ToR) and consist of representatives from key stakeholders (NSC, TNC, Kabi Kabi and at least two other independent parties).	1 Technical Advisory Group with TOR established	30 April 2020	Achieved	Terms of Reference (ToR) for the TAG finalised **200821 Noosa TAG ToR revised** Inaugural meeting held 13 May 2020. **200601 TNC Noosa TAG Meeting 1 - Minutes Final** Second meeting held 20 August 2020. **200830 TNC Noosa TAG Meeting 2 - Minutes Final** Key representation from the Kabi Kabi Nation have been invited to participate in the TAG meetings and have expressed a keen interest. To date, they have been unavailable to participate directly in the meetings but will be engaged by appropriate means.
(A1.2) Appointment of dedicated project manager who is a marine biologist with extensive project management experience, for the term of the Agreement.	1 Project Manager appointed	31 January 2020	Achieved	Craig Bohm appointed by TNC as Marine Coordinator for South East Queensland, based in Noosa. Position commenced 29 January 2020.
(A1.3) A Project Implementation Plan detailing at a minimum: A detailed risk assessment associated with the project. A communications and media plan, outlining	1 Project Implementation Plan completed and endorsed by Noosa Council	31 December 2019	Achieved Achieved	The project implementation plan was endorsed by Noosa Shire Council as the 'Project Management Plan' at its *Ordinary Meeting* held 16 July 2020.

media protocols, opportunities and the role of TNC and NSC. A monitoring, evaluation and reporting plan which identified ecological and social monitoring programs, how they will be reported on and how this will fed back into the project.	1 Detailed Risk Assessment included 1 Communications and Media Plan completed 1 Monitoring, Evaluation and Reporting Plan completed		Achieved Achieved	200802 Noosa Project Management Plan_V11 Endorsed
(A1.4) Participation and delivery of public education and engagement forums and media statements	3 community engagement forums facilitated 3 media statements released	30 June 2022	On track On track	Project manager and team have met with more than 67 stakeholder groups to talk with them about the project and to secure their in principle support. See: "Stakeholder Engagement" section of this report. 2 Noosa *Enviroforum* seminars held in November 2019 with TNC Chief Scientist, Pr. Hugh Possingham and Dr Chris Gillies. 1 media statement: 200301 - The surprising history of Queensland's oyster reefs revealed The statement details Aboriginal use (inc. Kabi Kabi) and historical harvest of oysters in SE Queensland was published in February 2020. 2 project-related publications: 2020 Thurston et al - Charting Two Centuries of Transformation in a Coastal Social-ecological System - A Mixed Methods Approach - SE Queensland 2020 Gillies et al - Conservation Status of Oyster Reef Ecosystem of Southern and Eastern

				Australia - Global Ecology and Conservation 1 TNC-orchestrated interview between the project manager and *Noosa Today* 1 positive media story in *Noosa Today:* **200708 Noosa Today - Oysters for the river not the menu** Additional: In response to COVID-19, and in compliance with TNC and government COVID-19 restrictions, community engagement actions beyond the above have been principally via extensive stakeholder meetings and phone calls between the Project Manager and key stakeholders. These are reported under the 'Stakeholder Engagement' section. The project team is currently refining the Communications Plan to adapt to the ongoing COVID-19 situation and to provide more creative avenues of informing the community about the project. The project has been invited to several community forums, but these have been delayed due to COVID-19 restrictions, as groups seek to adapt alternative engagement models. Community participation is being designed as part of the project monitoring, oyster gardening and *Shuck Don't Chuck* programs.
(A1.5) Annual project reports and final report each of which address, at a minimum:	3 six monthly status updates submitted to Noosa Council	First Report: 31 January 2020	Achieved	The first six monthly report was submitted to the Noosa TAG for review and then to TNC and Noosa Council.

Activities undertaken during the subject financial year, status and progress against deliverables, budget progress, income and expenditure, report against monitoring and evaluation program and measurable outcomes and outline of proposed upcoming works/activities for future period.	3 annual reports submitted to Noosa Council	For each annual report - yearly	On track	200601 TNC Noosa TAG Meeting 1 - Minutes Final This report is the first annual report to be submitted.
(A2.1) Oyster reef restoration suitability model incorporating physical parameters of oysters and public and industry usage, access etc. to identify priority sites for restoration.	1 Habitat suitability model developed which incorporates industry, Kabi Kabi and public interests	30 June 2020	Achieved	1 restoration suitability model developed as well as associated habitat suitability model and socio-economic suitability models. 200820 Noosa Restoration Suitability Model Report 1 associated presentation developed 200820 Noosa Restoration Suitability Model Presentation 1 restoration suitability model, which includes socio-economic information from river stakeholders, has also been developed and presented to the Noosa TAG.
(A2.2) Obtain necessary State Government permits/authorities including particular resource allocation authority, for oyster reef restoration	1 set of 'all' relevant state permits for oyster reef restoration in the Noosa River secured 1 set of 'all' relevant local government permits for oyster reef restoration in	31 December 2020	On track	The project team is preparing a highly developed set of documents to support the permitting process. This approach should help assure the relatively efficient progression of the permit applications through the governance systems of both Noosa Council and the Queensland government. Permit applications will be supported by detailed ecological mapping and engineering

	the Noosa River secured			certifications for the restoration design, restoration substrate configuration on-site, and signage and biosecurity management plan for live oyster and shell recycling, transport, handling and deployment.
(A2.3) Community, industry and stakeholder consultation sufficient to gain majority support for reef restoration locations.	1 set of engagement records provided to Noosa Council of public and stakeholder consultations, including one-on-one meetings, open forums, media, etc. 1 written permit secured from Noosa Council formally allowing the project to construct reefs.	31 December 2020	On track	The project has met with more than 67 key stakeholders to date. Most meetings have occurred since February 2020 when the project manager was appointed. See "Stakeholder Engagement" section of this report for details. A COVID-19 compliant public consultation process for the project is currently being designed, in consultation with Noosa Council staff, to seek formal endorsement for the preferred restoration sites. All stakeholders met with so far have expressed verbal support for the preferred restoration sites.
(A3.1) Community, industry and stakeholder consultation to identify most appropriate community volunteering opportunities (e.g. shell recycling, oyster gardens, oyster watch, video monitoring).	1 consultation completed 1 + volunteering opportunities identified	31 December 2020	On track	Discussions with restaurants re: *Shuck Don't Chuck* shell recycling project commenced in November 2019. Groups with an interest in supporting restoration monitoring, oyster gardening and shell recycling projects have been identified. Monitoring, shell recycling and oyster gardening systems are currently being refined. Volunteering will be constrained by COVID-19 restrictions on movement and contact, but the project will adaptively manage against these to ensure meaningful engagement occurs.

(A3.2) Establish at least one community volunteering program identified from the above process which takes into account current and future resources, management and interest.	1 + volunteering program defined and implemented *Record of volunteer hours dedicated to community volunteering programs, such as: shell recycling, oyster gardens, oyster watch, video monitoring.*	31 December 2020	On track	The project has identified *Oyster Gardening* as the first volunteering program. TNC is currently scoping this project and discussing its possible configurations with local groups. The general public will also have access to the program, which will commence in 2021, as the project is subject to permits being secured. There will also be some scope for volunteer in other aspects of the project, which are also being discussed with local groups.
(A4.1) Restoration at two sites (approx. 40m-50m shore length per site) which test reef design and construction and oyster growth and survival.	1 approval from Noosa Council secured to restore 2+ trial restoration sites in the Noosa River estuary 2+ sites recovered with at least overall 80 m shore length of reef constructed	30 June 2021	On track	Detailed site assessments and substrate design work is in progress. Documents to support applications for relevant permits are being prepared.
(A4.2) Restoration across multiple further sites, as determined by habitat suitability modelling and outcomes of community consultation.	1 approval from Noosa Council secured to restore an additional 2+ sites as agreed to by stakeholders, in the Noosa River estuary 2+ additional sites recovered with at least an overall additional 600m^2 surface area of	30 June 2021	On track	The project plans to secure approvals for all restoration sites and works from the community, NSC and the QLD Government prior to commencement of any works.

	established oyster reef, constructed in the Noosa River estuary.			
(A4.3) Monitoring and evaluation study for both pilot and full restoration sites. Monitoring to include oyster metrics, invertebrates and fish use (detailed in MER plan).	1 related reef monitoring program established 2 six monthly status reports submitted 2 annual monitoring and evaluation report cards produced and published	As required	On track On track On track	The Monitoring, Evaluation and Reporting (MER) Plan is in place and is being refined, as more specific methodologies are being refined, and in line with recommendations made by the independent review of the plan. See: **200802 TNC&NSC Noosa Project Management Plan Final – endorsed by Noosa Council** The MER plan is currently being operationalised and baselines established prior to the first deployment of restoration substrate into the estuary, forecast for 2021. The first six monthly report was completed in May 2020. **200527 TNC&NSC Noosa Oyster Project 6 Monthly Report 1** The first of these will be released annually after the deployment of substrate at the first two trial restoration sites in 2021.
(A5.1) Run workshop with Noosa Council to identify ongoing focus areas for TNC support.	1 workshop facilitated	31 March 2020	Achieved	2019 workshop held between TNC and NSC and discussions resulted in the development of the Alliance and Funding Agreement. TNC and NSC communicate weekly on areas of mutual interest and support.
*(A5.2) Provide technical/peer review on minimum five plans/reports/studies if requested by Noosa Council.	5 + peer review reports submitted to Noosa Council during the three-year term	30 June 2022	On Track	When requested

	of this Agreement, if requested by Noosa Council. *If Noosa Council requests a peer review, TNC will provide a minimum of 3 experts who are qualified in the relevant area of expertise for Noosa Council consideration and Noosa Council's acceptance of 1 expert for the peer review.*			
*(A5.3) Facilitate a minimum of three study tours of relevant sites in line with objectives and scope of the program in Australia/US if requested by Noosa Council (flights and incidentals covered separately by Noosa Council, accommodation and in country travel covered by this Grant).	3 + study tours facilitated during the three-year term of this Agreement, if requested by Noosa Council.	30 June 2022	On hold	Study tour 1 was in planning for 2020 but has been placed on hold due to COVID-19 travel restrictions. The study tour schedule will be revisited by TNC and NSC once COVID-19 travel restrictions have been eased or lifted.
*(A5.4) Review and feasibility of opportunities for sustainable commercial and recreational fishing management options for the Noosa River.	1 Conservation Action Plan developed, as required 1 set of Community Workshops facilitated, as required.	30 June 2022	On track	Detail to be agreed between parties
*(A5.5) Facilitate access to TNC conservation networks and researchers if requested by Noosa Council.	1+ new formal networking connections facilitated to assist Noosa Council with ongoing and future marine conservation activities*	30 June 2022	On track	When requested

	** As and if requested by Noosa Council*			
(A5.6) Promote Noosa Council's Noosa River Plan and shellfish restoration project in at least one national and one international conference.	1+ presentations given at national conference/s over 3 years 1+ presentations given at international conference/s over 3 years	30 June 2022	When able	All relevant conferences are currently suspended or cancelled due to COVID-19. The Noosa River Plan will be promoted once finalised.
(A5.7) Promote Noosa Council's Noosa River Plan and shellfish restoration project to corporate, philanthropic and state/federal government audiences to establish further support for conservation activities that support the Noosa River Plan	1+ New corporate/ government/ philanthropic alliances formed 1+ New in-kind support/financial funding contributions secured	30 June 2022	On track	TNC forged a new relationship with the Department of Environment and Science (DES), who has expressed support for the Noosa oyster project. TNC sits on the Department of Environment and Science (DES) Oyster Reef Restoration and Adaptation Working Group, which aims to advise a new policy framework for oyster restoration. TNC formed a new relationship with the Department of Agriculture and Fisheries for the purpose of progressing the Noosa project. TNC is formally discussing funding proposals with the Australian Government and Queensland Government to support oyster restoration work in Noosa and South East Queensland more broadly.
(A5.8) Assess feasibility of seagrass restoration in Lake Cooroibah as a method of reducing sediment resuspension and increasing invertebrate biodiversity	1 Habitat mapping report, habitat suitability model, PhD study or similar output completed and	30 June 2022	On track	TNC has contracted Ecological Service Professionals Pty Ltd to develop a map of seagrass beds in the Noosa River estuary including in Lake Cooroibah. TNC is discussing seagrass restoration research options

	presented to Noosa Council			with Central Queensland University.

Unforeseen issues arising and project adaptation

The delayed appointment of the project manager, along with a legacy of confusion in the community about the nature of the project, its purpose, relationship with the previous project (led by the Noosa Biosphere Reserve Foundation and University of the Sunshine Coast) and role in broader river issues, has meant considerable effort has had to be placed on community consultation meetings with numerous key stakeholders, rather than on progressing the refinements to the restoration design, engineering technical support, ecological assessments and shell recycling.

The project manager has invested heavily in stakeholder meetings (see 'Stakeholder' section) and building stakeholder relationships. While this work is far from complete, considerable progress has been made. Focus on these meetings will continue but work on the operational aspects of the project will also receive attention.

The project, project team and Noosa stakeholders have all been affected by COVID-19. Noosa has lost businesses, families have had to leave the region, and long-trusted systems of engagement and participation have been dissolved. We have all had to adapt to new ways of operating, of working together, of achieving progress. This has taken time, and much effort, as we all learn about 'Zoom', 'Microsoft Teams' and the art of working from home.

The Noosa oyster project has been particularly challenged in terms of community engagement. Personal contact has been constrained, prevented or limited. Group meetings and event planning have been stifled, and many locals made less available due to COVID-19 adaptation overload, reprioritisation of efforts, the fear of contamination and the pressure of home office and/or home schooling. However, the project has adapted to these changes and remains on track.

The mechanisms for community consultation have changed to primarily to 'one on one', or small group meetings. This is a highly effective consultation method, but is very time consuming. Progressing the restaurant component of 'Shuck don't Chuck' oyster recycling was delayed due to the COVID-19. This component will soon be reinvigorated. A shell recycling system with wholesalers has progressed and is in place. Community forums and presentations will now be primarily held 'online', rather than in face-to-face gatherings.

Community consultations and engagement

Community meetings

The project manager, working closely with council staff, has met with more than 67 key stakeholders and community representatives (see Table 2 below). Most of these meetings have occurred since February 2020. The list does not include individual households met (for reasons of privacy), some political meetings held at a state level and with research institutions, or internal meetings with TNC or Noosa Council staff.

The project manager met with some organisations on multiple occasions. While more meetings are needed, and a formal community consultation process regarding the selection of the restoration sites warranted, the overwhelming feedback received so far is positive and supportive. Once the project has been clearly explained, and contextualized, many groups have offered help and provide resources or public communication channels to share key messages and stories about the project.

Table 2: List of stakeholders met with to date

#	Organisation	Position	Organisation Type
1	Biotechnology Aquaculture Pty Ltd	Manager	Commercial
2	Boral - Moy Pocket	Accounts Manager	Commercial
3	Cafe Le Monde	Executive Chef	Commercial
4	Central Queensland University	Interim Director: Coastal Marine Ecosystems Research Centre	Science Community
5	Cleanaway	Site Manager	Commercial
6	Department Agriculture and Fisheries	Fisheries Officer	TAG
7	Department Agriculture and Fisheries	Principal Scientist (Aquatics) WSD Management and Bait Awareness Program, Biosecurity Queensland	TAG
8	Department Agriculture and Fisheries	Fisheries Officer	TAG
9	Department of Agriculture and Fisheries	Principal Policy Officer, Fisheries Queensland	State Agency
10	Department of Agriculture and Fisheries	Deputy Director-General, Fisheries and Forestry	State Agency
11	Department of Agriculture and Fisheries	Fisheries Officer	State Agency
12	Department of Agriculture and Fisheries	Principal Scientist (Aquatics) WSD Management and Bait Awareness Program, Biosecurity Queensland	State Agency
13	Department of Environment and Science	Principal Environment Officer, Aquatic Ecosystem Health& Environmental Monitoring and Assessment Science	TAG
14	Department of Environment and Science	Principal Environment Officer	State Agency
15	Department of Environment and Science	Acting Manager - Utilities and Government Organisations Assessment, Waste, Development & Southeast Compliance, Environmental Services and Regulation	State Agency
16	DigsFish Services Pty Ltd	Director, Digsfish Services	Science Community
17	Ecological Service Professionals Pty Ltd	Principal Ecologist (Director)	TAG
18	Fisheries NSW	Manager Marine Estate Oyster Reef Rehab	State Agency

19	Department of Agriculture and Fisheries	Fisheries Biologist, Impact Assessment and Management	State Agency
20	Fresh Advisory	Consultant	Commercial
21	Groundworks Plus	Senior Environmental Engineer	Contractor
22	Healthy Land and Water	Strategic Partnerships Manager	Non Govt Organisation
23	Healthy Land and Water	Scientific advisor	Non Govt Organisation
24	International Coastal Management	Principal Coastal Engineer	Contractor
25	James Cook University	Assistant Director - TropWATER Principal Research Scientist	Science Community
26	Kabi Kabi Nation	Technical advisor	Indigenous
27	Maritime Safety Queensland	Area Manager | Marine Operations – North Brisbane/Sunshine Coast	TAG
28	Massoud fisher family	Owner operator	Commercial
29	Mooloolaba River Fisheries	Retail Manager	Commercial
30	Noosa and District Landcare	Committee Member	Non Govt Organisation
31	Noosa Biosphere Reserve Foundation	President	Non Govt Organisation
32	Noosa Community Biosphere Association	Chair	Noosa Community
33	Noosa Environmental Education Hub	Director	Non Govt Organisation
34	Noosa Environmental Education Hub	Educator	Non Govt Organisation
35	Noosa Ferry and Cruise Company	Manager	Commercial
36	Noosa Ferry and Cruise Company	Manager	Commercial
37	Noosa Fish Providers Pty Ltd	Manager	Commercial
38	Noosa Heads Surf Life Saving Club	Restaurant Manager	Commercial
39	Noosa Integrated Catchment Association	President	Non Govt Organisation

40	Noosa Integrated Catchment Association	Project Officer	Noosa Community
41	Noosa Jetty Builders	Owner	Commercial
42	Noosa Parks Association	President	Non Govt Organisation
43	Noosa Yacht and Rowing Club	Club Manager	Commercial
44	Noosaville Fish Markets	Manager and chief	Commercial
45	O-Boats	Manager	Commercial
46	Noosa Waters estate	Director	Noosa Community
47	Ozfish - National	National Director	Non Govt Organisation
48	Ozfish - Central Moreton Bay Chapter	Manager	Non Govt Organisation
49	Ozfish - Noosa Chapter	President	Non Govt Organisation
50	PDF Food Distributors Pty Ltd	Sales Rep - Sunshine Coast	Commercial
51	Noosa North Shore Association Inc.	President	Non Govt Organisation
52	QLD Oyster Growers Association	Executive Officer	Commercial
53	Queensland Boating Patrol - Noosa	Manager	State Agency
54	Queensland Parks and Wildlife Service	Acting Principal Ranger, SE Queensland	State Agency
55	Queensland Parliament	Independent Member for Noosa	Politician
56	Resource Recovery Australia	National Manager	Commercial
57	Resource Recovery Australia	Noosa Facility Manager	Commercial
58	Shuck It Pty Ltd	Manager	Commercial
59	Soulfish Seafoods	Owner	Commercial
60	Noosa Today	Journalist	Commercial
61	Tewantin Bushcare	Coordinator	Noosa Community
62	The Thomas Foundation	Advisor	Non Govt Organisation
63	The University of Queensland	Lecturer	Science Community

64	Thomas Corner Eatery	Chef and Owner	Commercial
65	Tourism Noosa	Head of Tourism Sustainability + Design Program	Commercial
66	Tourism Noosa	Chief Executive Officer	Commercial
67	University of the Sunshine Coast	Lecturer in Animal Ecology School of Science and Engineering	Science Community

Shuck Don't Chuck – shell recycling project

Shuck Don't Chuck has commenced with engagement of Mooloolaba River Fisheries and Resource Recovery Australia to facilitate the wholesale (or bulk supply) of oyster shell for the project.

Shuck Don't Chuck at a local level has been scoped with local seafood retailers but was put on hold due to COVID-19 restrictions and challenges. The project now plans to re-engage local businesses in *Shuck Don't Chuck* in the lead up to the summer tourist season.

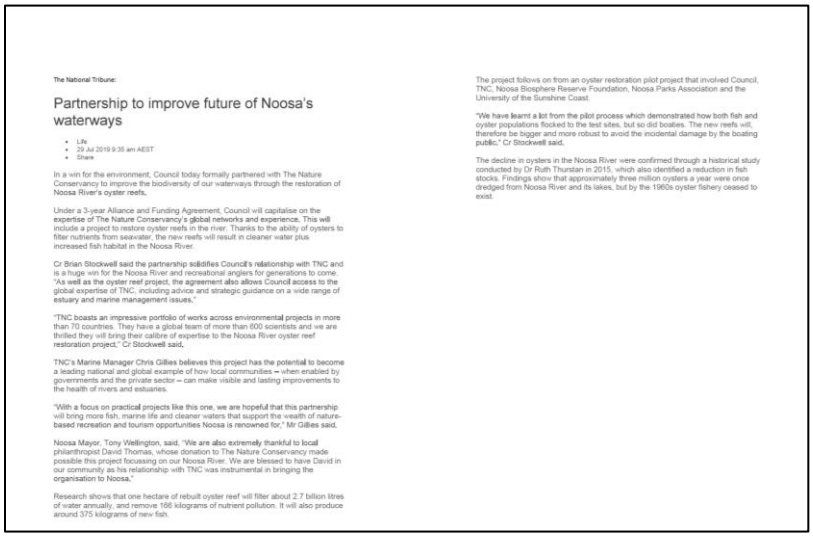
Noosa oyster gardening

The project has selected oyster gardening as the primary wide-community engagement vehicle for the project. While there will be some opportunities to be involved in oyster bed monitoring, as well as other education actions, the project team expects oyster gardening to have wide local appeal, to groups, schools and individuals.

TNC has established Mussel gardening in Western Australia, with wide community appeal. The Mussel gardening handbook will now be adapted for oyster gardening in Noosa. Oyster gardening is currently being scoped, with implementation planned for 2021, once the relevant permits are secured and management systems established.

Media

A. Project in the News



The National Tribune:

Partnership to improve future of Noosa's waterways

- Life
- 29 Jul 2019 9:36 am AEST
- Share

In a win for the environment, Council today formally partnered with The Nature Conservancy to improve the biodiversity of our waterways through the restoration of Noosa River's oyster reefs.

Under a 3-year Alliance and Funding Agreement, Council will capitalise on the expertise of The Nature Conservancy's global networks and experience. This will include a project to restore oyster reefs in the river. Thanks to the ability of oysters to filter nutrients from seawater, the new reefs will result in cleaner water plus increased fish habitat in the Noosa River.

Cr Brian Stockwell said the partnership solidifies Council's relationship with TNC and is a huge win for the Noosa River and recreational anglers for generations to come. "As well as the oyster reef project, the agreement also allows Council access to the global expertise of TNC, including advice and strategic guidance on a wide range of estuary and marine management issues."

"TNC boasts an impressive portfolio of works across environmental projects in more than 70 countries. They have a global team of more than 600 scientists and we are thrilled they will bring their calibre of expertise to the Noosa River oyster reef restoration project," Cr Stockwell said.

TNC's Marine Manager Chris Gillies believes this project has the potential to become a leading national and global example of how local communities – when enabled by governments and the private sector – can make visible and lasting improvements to the health of rivers and estuaries.

"With a focus on practical projects like this one, we are hopeful that this partnership will bring more fish, marine life and cleaner waters that support the wealth of nature-based recreation and tourism opportunities Noosa is renowned for," Mr Gillies said.

Noosa Mayor, Tony Wellington, said, "We are also extremely thankful to local philanthropist David Thomas, whose donation to The Nature Conservancy made possible this project focussing on our Noosa River. We are blessed to have David in our community as his relationship with TNC was instrumental in bringing the organisation to Noosa."

Research shows that one hectare of rebuilt oyster reef will filter about 2.7 billion litres of water annually, and remove 166 kilograms of nutrient pollution. It will also produce around 375 kilograms of new fish.

The project follows on from an oyster restoration pilot project that involved Council, TNC, Noosa Biosphere Reserve Foundation, Noosa Parks Association and the University of the Sunshine Coast.

"We have learnt a lot from the pilot process which demonstrated how both fish and oyster populations flocked to the test sites, but so did boaties. The new reefs will, therefore be bigger and more robust to avoid the incidental damage by the boating public," Cr Stockwell said.

The decline in oysters in the Noosa River were confirmed through a historical study conducted by Dr Ruth Thurstan in 2015, which also identified a reduction in fish stocks. Findings show that approximately three million oysters a year were once dredged from Noosa River and its lakes, but by the 1960s oyster fishery ceased to exist.

Reference: 190729 The National Tribune - Partnership to improve future of Noosa's waterways - collated

Noosa news

NEWS

Shell-shocker: Nature group says Noosa oyster reefs the real deal

PETER GARDINER
16th Feb 2020 6:00 AM
Subscriber only

A MAJOR conservation group partnering with the Noosa Council on its Bring Back the Fish project said the use of recycled oyster shells to create new living shellfish reefs is a proven restoration technique.

The Nature Conservancy's spokesman Dr Chris Gillies has taken issue with claims by mayoral candidate Clare Stewart that the recent oyster regeneration trials were a failure and that the use of dead shells in coir bags would not create new oyster growth.

Ms Stewart was critical that a large number of the reefs were removed from the river and dumped at the council tip.

"We are disappointed that Ms Stewart did not contact The Nature Conservancy to validate her statements on the Bring Back the Fish project before making public comment," Dr Gillies said.

"We invite her to attend a briefing on the project and learn about the science supporting the project.

"The use of recycled oyster shells to create new living shellfish reefs is a proven restoration technique used throughout the world including our projects in Victoria, South Australia and Western Australia.

"Free swimming, living baby oysters are attracted to these recycled shells upon which they settle and commence the creation of new, living reefs," he said.

Dr Gillies said the conservancy had restored more than 200 oyster reefs in the last 15 years and is currently working to restore reefs in Hong Kong, Europe, the United States, New Zealand and Australia.

Dr Gillies said the bags filled with oyster shell were deployed in the estuary by USC to determine where baby oysters are most likely to settle and survive and were designed to be removed after three years of deployment.

The Nature Conservancy, University of Sunshine Coast, Noosa Council, University of Queensland and other scientists have been working for more than five years to assess the feasibility of restoring oyster reefs in the Noosa estuary as one way to improve local marine life and fishing.

"The results of this five year scientific analysis indicate that oyster reef restoration is feasible," Dr Gillies said.

"The connection between oyster reefs and an increase in marine life including fish has been scientifically proven the world over including in southeastern Queensland.

"Noosa estuary once had prolific oyster reefs but these were lost in the early 1900s and have not naturally recovered," he said.

"The Nature Conservancy has committed $1.2 million of its own resources to support the recovery of oyster reefs in Noosa, based on the outcomes of the five year scientific study," he said.

Dr Gillies said prior to restoring oyster reefs at Noosa later this year, the conservancy will undertake "a thorough community consultation process, including workshops with estuary users and estuary-based industries to determine the best location for oyster reefs".

"This process will be supported by the latest scientific evidence and traditional knowledge," he said.

"The Nature Conservancy has already created living, sustainable shellfish reefs around four times the size of the Gabba in Victoria, South Australia and Western Australia.

"Our reef projects have created thousands of sustainable jobs around the world," Dr Gillies said.

Reference: 200216 Noosa News - Nature group says Noosa's oysters the real deal

Oysters for the river not the menu

DPI NSW officer inspects shellfish substrate in Port Stephens. Photos kylie Ruzsell.
By Margaret Maccoll

The oysters destined to grow and form reef beds in the Noosa River are not intended for the dinner plates of Noosa restaurants or homes.

The Nature Conservancy Noosa shellfish restoration project manager Craig Bohm said the project aims to restore the oyster beds that once spread across the Noosa riverbed and created a rich ecosystem and shelter for a variety of fish species.

It is not intended to be an aquaculture project for oyster harvesting.

"This restoration substrate is laid at the restoration sites, in a tried and trusted way that creates 'aggregate lock' whereby materials hold each other on site by the way they interlock with each other. The configuration of the substrate is determined specifically for each individual location and in close reference to the bathymetry and hydrographic (current flow and velocity) information for the site."

Mr Bohm said TNC plans to progress slowly with the project, taking the time to consult with stakeholders to gain their views, explain their plans and share knowledge as they go along.

"We have to fit in with the ebb and flow of the Noosa river," he said.

"We have to fit in with where people are using the river and surgically place these oyster beds without getting in the way of Noosa users."

Once the oyster substrate is sited it should only be a few weeks before oysters begin to grow and flourish.

Mr Bohm said they would encourage people not to eat the oysters which would filter and absorb toxins but to regard the structures as an environment as they would a rainforest or the everglades.

Craig Bohm arrived in Noosa in February to take on the project manager role after six years working on community development projects in Fiji.

And while he walked in just as COVID-19 was shutting down the region there has been plenty of behind the scenes work to keep him busy.

There have been a range of government permits to secure and studies to perform before the project can go ahead.

Mr Bohm said the shellfish restoration project would be very different from the University of the Sunchine Coast oyster reef trial which had yielded valuable insights into shellfish recruitment in the river.

TNC will draw on its knowledge and experience acquired from 30 years of creating oyster reefs in South Australia, Victoria and Western Australia

"These techniques have been reviewed by scientists, and are now accredited for use by the Society for Ecological Restoration," he said.

He meets regularly with the recently formed Technical Advisory Group (TAG), a group of specialists in shellfish restoration, local and state government processes and project management, who are guiding the project as it unfolds.

TNC is doing its own studies of the river, completing a technical shellfish restoration suitability model for the Noosa estuary, including undertaking detailed site analyses to guide the configuration and placement of restoration substrate.

"It's very scientific," Mr Bohm said. "We have to look at where oysters grow. In the Noosa River there are lots of oysters but few suitable places to form shellfish ecosystems.

"Rock oysters want to live in the Noosa estuary, but they lack the right type and shape of settlement substrate on which to re-establish themselves and form proper shellfish beds (rather than just a few oyster grouped together on a pilon, rock wall or jetty). Our Noosa project will lay the right substrate oysters and other species need to form complex shellfish beds.

Reference: 200701 Noosa Today - Oysters for river not menu - collated

B. Project in Science

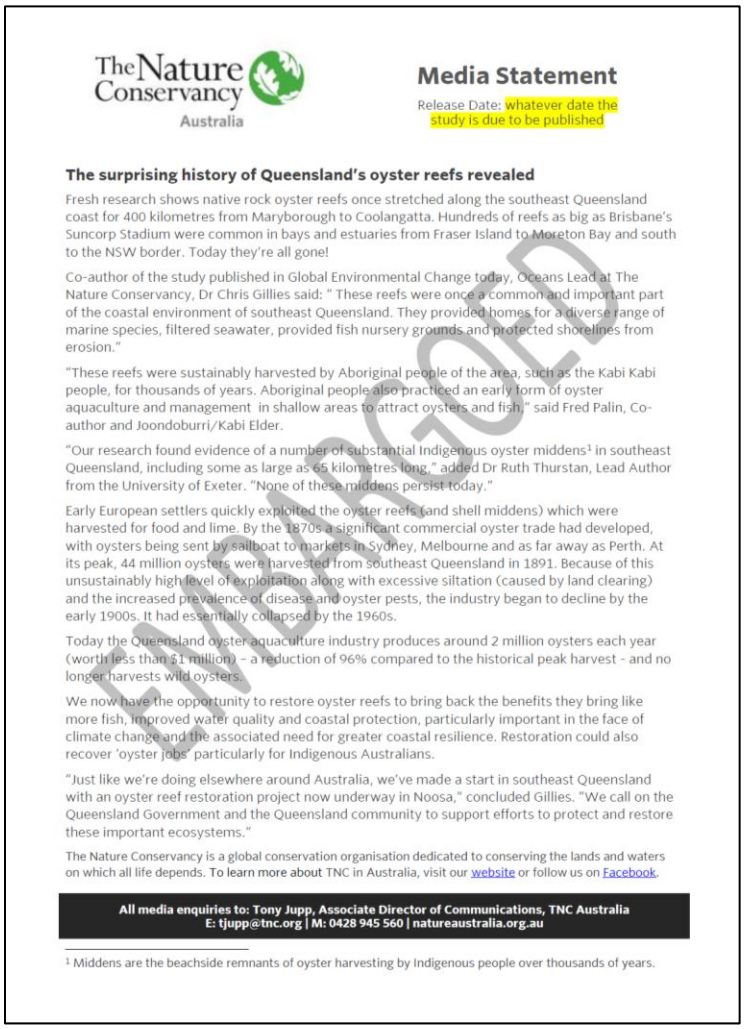
Dr Chris Gillies authored a seminar scientific paper about the conservation status of oyster ecosystems in Australian waters. This paper provides an important background for the Noosa oyster project. The work has led to rock oyster ecosystems being listed by the International Union for the Conservation of Nature (IUCN) listing rock oyster ecosystems as critically endangered.

Reference: 2020 Gillies et al - Conservation Status of Oyster Reef Ecosystem of Southern and Eastern Australia - Global Ecology and Conservation

Dr Chris Gillies co-authored a new scientific study: Charting two centuries of transformation in a coastal social-ecological system: a mixed methods approach.

The paper was published in *Global Environmental Change* with Dr Ruth Thurston as Lead author. The study identifies Aboriginal use, including Kabi Kabi, and early European harvesting of oysters from southeastern Queensland including Noosa. TNC released a media statement in March 2020 on the study, which mentions the Noosa oyster project as an example of restoration.

References:
Media Statement: 200301 TNC Media Statement - The surprising history of Queensland's oyster reefs revealed
Research publication: 2020 Thurston et al - Charting Two Centuries of Transformation in a Coastal Social-ecological System - A Mixed Methods Approach - SE Queensland



The Nature Conservancy Australia

Media Statement

Release Date: whatever date the study is due to be published

The surprising history of Queensland's oyster reefs revealed

Fresh research shows native rock oyster reefs once stretched along the southeast Queensland coast for 400 kilometres from Maryborough to Coolangatta. Hundreds of reefs as big as Brisbane's Suncorp Stadium were common in bays and estuaries from Fraser Island to Moreton Bay and south to the NSW border. Today they're all gone!

Co-author of the study published in Global Environmental Change today, Oceans Lead at The Nature Conservancy, Dr Chris Gillies said: " These reefs were once a common and important part of the coastal environment of southeast Queensland. They provided homes for a diverse range of marine species, filtered seawater, provided fish nursery grounds and protected shorelines from erosion."

"These reefs were sustainably harvested by Aboriginal people of the area, such as the Kabi Kabi people, for thousands of years. Aboriginal people also practiced an early form of oyster aquaculture and management in shallow areas to attract oysters and fish," said Fred Palin, Co-author and Joondoburri/Kabi Elder.

"Our research found evidence of a number of substantial Indigenous oyster middens[1] in southeast Queensland, including some as large as 65 kilometres long," added Dr Ruth Thurstan, Lead Author from the University of Exeter. "None of these middens persist today."

Early European settlers quickly exploited the oyster reefs (and shell middens) which were harvested for food and lime. By the 1870s a significant commercial oyster trade had developed, with oysters being sent by sailboat to markets in Sydney, Melbourne and as far away as Perth. At its peak, 44 million oysters were harvested from southeast Queensland in 1891. Because of this unsustainably high level of exploitation along with excessive siltation (caused by land clearing) and the increased prevalence of disease and oyster pests, the industry began to decline by the early 1900s. It had essentially collapsed by the 1960s.

Today the Queensland oyster aquaculture industry produces around 2 million oysters each year (worth less than $1 million) – a reduction of 96% compared to the historical peak harvest - and no longer harvests wild oysters.

We now have the opportunity to restore oyster reefs to bring back the benefits they bring like more fish, improved water quality and coastal protection, particularly important in the face of climate change and the associated need for greater coastal resilience. Restoration could also recover 'oyster jobs' particularly for Indigenous Australians.

"Just like we're doing elsewhere around Australia, we've made a start in southeast Queensland with an oyster reef restoration project now underway in Noosa," concluded Gillies. "We call on the Queensland Government and the Queensland community to support efforts to protect and restore these important ecosystems."

The Nature Conservancy is a global conservation organisation dedicated to conserving the lands and waters on which all life depends. To learn more about TNC in Australia, visit our website or follow us on Facebook.

All media enquiries to: Tony Jupp, Associate Director of Communications, TNC Australia
E: tjupp@tnc.org | M: 0428 945 560 | natureaustralia.org.au

[1] Middens are the beachside remnants of oyster harvesting by Indigenous people over thousands of years.

Reference: 200301 TNC Media Statement - The surprising history of Queensland's oyster reefs revealed

TNC also produced a scientific paper that provides a step by step summary of how to establish a shell recycling project. The paper uses the *Shuck Don't Chuck* project in Victoria as the case study and advises the Noosa shell recycling project.

Reference: *Shell Recycling Paper -Branigan, S, Fitzsimons J, and Gilles CL (In Press) Modern middens: Shell recycling for restoring an endangered marine ecosystem in Victoria, Australia. Ecological Restoration and Management.*

Presentations

Thursday 25th of July (2019), TNC Program Director, Oceans, Chris Gillies. presented at Noosa Shire Council.

Friday 26th of July (2019), TNC Program Director, Oceans, Chris Gillies presented at the Noosa 'Enviroforum'.

Friday 29th of November 2019, TNC Chief Scientist, Pr. Hugh Possingham, presented at the Noosa 'Enviroforum'.
Thursday 25th of June 2020, TNC Program Director, Oceans, Chris Gillies, + Project Manager, Craig Bohm, presented to Noosa Shire Council.

Project finances

This section details the project finances. Table 3 presents project expenditure across five activity codes:

1. Reef Building
2. Hatchery and seedling
3. Reef integrity and performance assessment
4. Community engagement, volunteering and media
5. Project management

To date, a total of 18 percent of the total project budget has been spent. This is significantly less than the 31 percent anticipated in the first year of a three-year and three-month long project. Considerable savings have been made in the following areas:

- Data analysis and restoration suitability mapping – achieved in-house rather than outsourcing.
- Office space and equipment and sundry costs – project manager is working from home office.
- Technical assessments – project manager and in kind contributions from experts.
- Travel, training and conferences – COVID-19 impact.

The following current contracts are in place:

- Ecological Service Professionals Pty Ltd - Seagrass and habitat mapping contract ($42,592)
- Resources Australia Ltd - Oyster shell transport contract (up to approx. $15,000 over 2.5 years)

The following Requests for Quotation (RFQ) are under development and will shortly be released for tendering:

- Detailed intertidal and shallow subtidal bathymetric assessment of proposed restoration sites
- Engineering advice and certification of restoration designs, configurations and signage

In Year 1, the project team also undertook:

- Extensive detailed planning, with the development of a Project Management Plan, Risk management plan, Monitoring, Evaluation and Reporting (MER) plan, Communications plan and development of the Technical advisory group.
- Detailed field assessments to identify candidate restoration sites and analysed those sites with stakeholders through one-on-one meetings and site visits.
- Identified partners for collaboration in aspects such as water quality monitoring.
- Designed and entered into complex contracts for further detailed habitat and bathymetric assessments and shell recycling.
- Commenced negotiations with Central Queensland University about seagrass restoration in the Noosa River.
- Engaged a technical intern.
- Supported three post graduate students wishing to work in beneficial environmental projects in Noosa.

In Year 2 costs are expected to flow towards community outreach, as Shuck Don't Chuck and oyster gardening projects coming online, contracts for technical assessments, monitoring and evaluation and the procurement and deployment of restoration substrates at the first two sites.

Table 3: Total project expenditure

PROJECT COSTS	Total Budget	Expenditure to date	Remaining budget
Reef Building Bathymetric, hydrological assessments, oyster bed engineering, rock and shell material procurement, construction and engineering assessments.	861,982	100,915	761,067
Hatchery and seeding Procurement of oysters, hatchery/farmer engagement, shell transport, recycled shells collection, permitting, record keeping and reporting.	293,332	29,575	263,757
Reef integrity and performance assessment Pre-substrate deployment site assessments (bottom ecology, surface profiles, oyster densities, vulnerable habitats mapping (e.g. seagrass), river uses analysis (e.g. boating, fishing), data analysis, WHS and safety plans, operational equipment, periodic reports.	580,289	24,325	555,964
Community engagement, volunteering and media Community engagement products, engagement coordination, sub-contractor identification, contracting and management, volunteer briefings, volunteer recruitment, stakeholder meetings, personal protective equipment, media statements, media management and education material production and distribution.	424,397	177,722	246,675
Project Management Production of Project Management Plan, Monitoring Evaluation and Reporting Plan, Communications Plan, project risk assessments, plan and risk refinements and revisions, government permitting, legal, technical science support	240,000	102,017	137,983
Total expenditure	**2,400,000**	**434,554**	**1,965,446**

Next steps

The next steps for the project include:

Oyster ecosystem restoration

1. Finalisation of detailed bathymetric, engineering and habitat surveys
2. Finalisation of restoration substrate design and configurations + engineering certification
3. Pre-permit lodgement meeting with SARA
4. Drafting of permit applications and approvals
5. Submission of permit applications
6. Engagement of restoration contractors
7. MER Plan implementation

Community Engagement

1. Shell recycling and re-engagement of restaurants for *Shuck Don't Chuck* program
2. Formal community consultation on restoration sites Consultation report to TNC and Noosa Council
3. Completion of communication products, publication and distribution
4. Scoping, design and launch of Oyster gardening
5. Identification and formal engagement of project partners in project actions