Whitsunday Reef Recovery and Public Art Project
Public Information Package

Public Comment
Reef Ecologic now seeks any public comment under Regulation 88PD of the Great Barrier Reef Marine Park Regulations 1983 (Cth). Public submissions will be considered by the Great Barrier Reef Marine Park Authority (GBRMPA) in making a decision on this permit application.

Submissions
All comments and submissions to:
Great Barrier Reef Marine Park Authority,
Environmental Assessment and Protection Unit,
PO Box 1379,
Townsville QLD 4810
Email: assessments@gbrmpa.gov.au
Website: www.gbrmpa.gov.au/about-us/consultation

February 2019
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Tourism Whitsundays and the greater Whitsunday tourism industry are very pleased with the implementation and progress of the Whitsunday Reef Recovery and Public Art Package lead by Reef Ecologic.

Tourism Whitsundays is the lead agency responsible for destination marketing and visitor attraction, whose role it is to represent, grow, promote, and advocate on behalf of, the Whitsunday tourism industry. Tourism Whitsundays vision is to showcase the Whitsundays as the globally recognized Great Barrier Reef destination. We do this by promoting the destination globally to increase visitation, dispersal, expenditure and length of stay; driving the economic benefit and sustainability of the tourism industry through marketing and industry development. Tourism Whitsundays represents over 300 members throughout The Whitsunday region which encompasses Airlie Beach, Bowen, Collinsville, Proserpine and the Whitsunday islands.

Currently the tourism industry in the Whitsunday region is the largest employer, accounting for approximately 40% of jobs and is the second-largest contributor to the region’s economy. The Whitsunday region is located in the heart of the Great Barrier Reef, 86% of all tourism visitation to the Great Barrier Reef occurs within waters adjacent to Cairns and the Whitsundays. Snorkelling, diving and exploring the reefs around the Whitsunday Islands is a major driving force for our tourism in our region.

Economically, the destruction of the Whitsunday reefs would ultimately mean destruction of our tourism industry, which would have a significant impact on the Whitsundays’ broader economy due to flow-on effects. One in four people in the Whitsunday region are dependent on tourism and that figure rises to one in three if we include related businesses and supply chains.

Unfortunately, the past number of years have seen the Whitsundays inshore reefs under pressure, we believe this pressure is primarily due to issues to do with suspended sediments, rising water temperatures and a number of cyclones, in particular Cyclone Debbie. Prior to Cyclone Debbie, the Whitsundays had become Australia’s number one destination for accessing the Great Barrier Reef Marine Park, with over one million Environmental Management Charge (EMC) visits, surpassing all other Great Barrier Reef accessibility ports. Notably this is within an area comprising just 1% of the park’s geographical size.

Our local tourism operators are extremely passionate about the reef and actively support any measures to ensure its preservation. We believe Coral Gardening and the Underwater Sculptures to be some of these measures. The establishment of underwater art and coral nurseries at popular bays in the Whitsundays will compliment existing tourism products and provide an additional reason for travellers to visit. We believe it will also facilitate education about reef conservation in a positive manner, amongst tourism operators, marine industry, crews and visitors to the Whitsundays and the Great Barrier Reef.

The preservation and education of our reefs are paramount to the longevity of our tourism industry, we believe we are addressing these challenges through the Whitsunday Reef Recovery and Public Art Package work being led by Reef Ecologic.

Kind regards,

Natassia Wheeler
CEO
Message from Whitsunday Traditional owners

We are representatives of the Gia, Ngaro and Juru traditional owners and it is our pleasure to submit a letter of support for the Whitsunday Reef Recovery and Public Art project.

The Gia, Ngaro and Juru people are the Traditional Owners of the land and sea on which the Whitsunday Reef Recovery and Public Art project will be located. We are the seafarers ‘canoe people’ who have inhabited the area since 9000BP. Traditionally, since the beginning, the Ngaro were dependent on the ocean. We relied on the reefs, mangroves and sea for our food, shelter and culture. Our ancestors hunted large marine animals from large, three sheet bark, diamond shaped canoes with oblique ends called ‘Winta’. We moved around freely between at least 8 of the major islands Hook, Whitsunday, Lindeman, South Molle, Hamilton, Hayman, Daydream and others.

We are proud of our rock art cultural sites on Hook Island which are some of the oldest archaeological sites in Eastern Australia. We would also like to acknowledge the Yuwibara, Koinmerburra, Barada Barna and Wiri peoples who all have traditionally inhabited the Central Queensland region.

Traditional owners have been informed and consulted about the scope of the project during 2018 including meetings of the Whitsundays Local Marine Advisory Committee, Bowen Local Marine Advisory Committee and Proserpine Indigenous Reference Group. We support the educational benefits of the underwater sculptures and particularly turtles, Manta rays, fish and coral that will increase awareness and appreciation of these species and reef issues and solutions.

We are delighted that three of the four artists are working closely with traditional owners to incorporate indigenous knowledge and artwork into their underwater sculpture designs. Well known Torres Strait indigenous artist Brian Robinson has collaborated with on Niki Bidju Pryor on both Bywa and Migration of the Mantas. Niki Bidju Pryor has also worked collaboratively with Arts Collective on Anthozoa and the proposed ‘Ngaro Dreaming of Anthozoa- Digital Interpretation’. Adriaan Vanderlugt has worked collaboratively with Arthur Gaby to illustrate the Manta Ray.

Our aspirations for the underwater sculptures will lead to increased cultural interpretation, environmental education and improved health of the Whitsunday coral reefs and the broader Great Barrier Reef. In the future we anticipate that these underwater sculptures and associated reef restoration projects will lead to increased involvement of traditional owner scientists, artists, tourism operators and guides, reef rangers in the governance of the Great Barrier Reef.

Alena West, Agnes Boyd, Toni Pryor, Roscoe Pryor, Boori Pryor Lynette Pryor, Cilla Pryor, Adrena Pryor, Elsie Kyle, Marie Coleman, Carol Prior

Whitsunday Traditional Owners
Background

In March 2017 Cyclone Debbie significantly damaged tourism and residential infrastructure, and some of the natural values of the Whitsundays (Chen 2017, Reynolds, 2017, Tourism and Events Queensland, 2017). The clean-up and recovery have restored some infrastructure and tourism activity but many natural values such as large coral reef bommies may take decades to recover. Tourism operators and government are trying to make a positive difference for coral reefs damaged by Cyclone Debbie.

This project represents an opportunity to link existing tourism products and attractions with new experiences through the development of the Whitsundays reef and island learning trail, involving marine public art installations combined with reef rehabilitation projects. Underwater public art, sculptures and reef restoration projects have been successfully installed in Australia and throughout the world and have led to multiple environmental, social and economic benefits.

This is one of several key projects under the $7 million Tourism Recovery Fund, part of the jointly funded State and Federal Government $10 million tourism recovery package to support the rebuilding and recovery of the tourism industry in the Whitsundays. The Whitsunday reef recovery and public art project commenced in May 2018 and is due for completion by December 2019. The project is delivered on behalf of the Department of Innovation, Tourism Industry Development and the Commonwealth Games and led by Reef Ecologic Pty Ltd in partnership with Tourism Whitsundays, Whitsunday Regional Council with advice from Whitsunday and Bowen Local Marine Advisory Committees and stakeholders. We are working closely with the Great Barrier Reef Marine Park Authority (GBRMPA) and Queensland Parks and Wildlife Service (QPWS).

The Whitsunday reef recovery and public art project approach is based on extensive and ongoing community and stakeholder consultation and collaboration. We have co-designed and adapted the project with the tourism industry, council and government. The scoping stage of the project included underwater visual reef health surveys to determine which reefs have been damaged and which area are healthy. We advertised a global expression of interest for public underwater art and sculpture ideas and conducted a pilot research study supported by CSIRO to trial different art materials at different locations on Langford Reef and received over 400 survey responses. We worked with James Cook University and local citizen scientists installing coral nurseries containing 425 corals to support reef restoration at two degraded bays. All research was permitted by the GBRMPA and installations were supervised by QPWS.

This Public Information Package provides relevant information for the permit assessment phase associated with the proposed installation of six sculptures of marine species in the Great Barrier Reef Marine Park (Figure 1). These sculptures were selected by an independent local committee and are being designed and built by Whitsunday and Australian artists in consultation with Traditional Owners. We propose that these sculptures will be installed at Horseshoe Bay, Langford Reef, Blue Pearl Bay and Manta Ray Bay to coincide with celebrations of World Oceans Day, 8 June 2019. An initial 6 year permit has been requested. Towards the end of this permit, the sculptures will be surveyed and a decision will be made whether the sculptures are to remain within the Marine Park and whether further permission is required, or are removed. It is anticipated that the underwater sculptures and existing reef restoration research infrastructure will be a positive asset and attraction for locals and tourists, will increase awareness of reef species, education, research and management and provide opportunities for visitors and the local community to actively engage in supporting the health of the Great Barrier Reef.

![Figure 1: Whitsunday Reef Recovery and Underwater Art Project approach](image-url)
About the Whitsunday Reef Recovery and Public Art Project (the Why)

The Whitsunday Reef Recovery and Public Art Project has been developed to support the socio-economic and ecological values of high value tourism destinations throughout the Whitsundays Region (Figure 2). A primary motivation for proposing underwater sculptures in the Whitsundays was the desire to improve and support reef health and in-water tourism activities as part of the Cyclone Debbie recovery activities. A number of projects have focused on rebuilding boardwalks, installing new trails and improving terrestrial access to many of the Whitsunday Islands. However little action had been made to repair or improve underwater attractions in the region. May 2018 and is due for completion by December 2019. The project is led by Reef Ecologic Pty Ltd in partnership with Tourism Whitsundays, Whitsunday Regional Council and the advice from Whitsunday and Bowen Local Marine Advisory Committees and stakeholders. We are working closely with the Great Barrier Reef Marine Park Authority (GBRMPA) and Queensland Parks and Wildlife Service (QPWS).

Following Cyclone Debbie, a number of dive and snorkel tourism operators changed destinations, altered programs or ceased activities altogether in response to degraded coral reefs. As part of the Whitsunday Reef Recovery and Public Art Project, Reef Ecologic proposed the installation of new attractions in degraded locations that would both provide aesthetic enjoyment and appeal but support reef health and resilience. Art installations and sculptures provide new attractions that can entertain and excite visitors to a region. The sculptures will provide habitat complexity for marine life and as benthic organisms attach to the sculptures, they will, over time, become more integrated with the natural environment. Marine organisms may aggregate to the greater complexity and relief provided by the sculptures. From a social perspective, educational materials (flyers and presentations by tourism operators) will assist in raising awareness of threats to the Reef, particularly climate change, encouraging behavioral change. Throughout the world there are a large number of public artworks on foreshore islands and in cities but very few underwater.

The health and condition of many of the Whitsunday reefs has deteriorated substantially as a result of recent disturbances. We conducted Reef Health Impact Surveys (RHIS) at nine sites throughout the Bowen-Whitsunday region during May-June 2018 to determine benthic environments (Figure 3). The benthic environments were dominated by rock and coral. Live coral cover varied from 3 to 50% (Figure 3).

The Reef Health Impact Survey (RHIS) survey results of benthic environments were used to share baseline knowledge and inform discussions on the potential location of underwater art installations and reef restoration projects.

During our initial consultations with stakeholders many queries arose focusing on the opportunity, risks, purpose, safety and potential locations of underwater art and reef restoration. In response, Reef Ecologic worked with stakeholders and government to undertake a small-scale research project to deploy art at multiple locations at Langford Reef. This ‘proof of concept’ research and the large number of survey responses (n=446) indicated a
preference for underwater art (as opposed to intertidal or on land) and the importance of art linked to marine education which allowed us to co-design this proposed project. The research was also a great opportunity to test installation and removal methods of underwater art sculptures.

On 29 June 2017 Reef Ecologic launched a public call to artists and received 73 applications. An independent selection panel considered all the applications and recommended six sculptures to be commissioned. Artists contracts were signed during September 2018 and works are planned to be completed between Feb-May 2019.

In November 2018, Reef Ecologic received a research permit from GBRMPA and QPWS to install coral nurseries at Blue Pearl and Manta Ray Bay. These facilities are submerged aluminum trays and floats of a similar size to the proposed underwater sculptures and are anchored on bare sand/coral rubble. We propose that four of the six proposed underwater art sculptures will be co-located and complementary with the reef restoration research at Manta Ray and Blue Pearl Bay.

What is the relationship between underwater sculptures and reef recovery?

A driver for the expanding interest in underwater art is the increase in public concern for the future of marine ecosystems, especially coral reefs. Around the world, coral reefs are declining with flow on impacts to local communities, businesses and broader society. Art projects have emerged as an important contribution to the social discourse and education on the importance of our oceans including iconic marine species, their fragility, and the urgent need to address the causes of their deteriorating health.

Additionally, the many of the proposed sites for the installation of underwater art (Langford Reef, Blue Pearl Bay, Manta Ray Bay) have shown substantial decreases in visitation due to degradation of natural underwater habitats. Consequently, tourism operators have altered their schedules to avoid or reduce frequency of visitation to these sites. This has led to an over-abundance of visitors at alternative sites where coral cover and associated biodiversity remains relatively high. The introduction of underwater art will attract tourism operators and other visitors back to locations currently less frequented, increasing the dispersal of visitation in the region. This will re-introduce diversity of tourism sites and provide alternative in-water visitor experiences, both activities which are likely to enhance system resilience and recovery further supporting socio-economic and ecological values of the Great Barrier Reef Marine Park.
What are underwater sculptures?

Underwater sculptures are artworks that are placed underwater on the seafloor or riverbeds to provide fascinating visual, emotional and physical experiences for visitors. Underwater sculptures provide opportunities for visitors to engage with the artworks through SCUBA diving or snorkeling, while intertidal or coastal installations provide opportunities for pedestrians or other non-swimming visitor to interact with the artworks.

Underwater art has a long history, with a range of artworks installed in underwater environments at popular dive locations around the world over the last few decades. Until recently, underwater art installations were usually individual sculptures, often installed by private businesses or local governments as isolated attractions and without overt connections to environmental issues or education (Figure 4).

Recently, an art movement has emerged with a strong focus on environmental issues and social engagement. Artists are placing environmental and social issues at the forefront of their art practice. This movement has spawned several major art installations, taking the form of mostly coastal (Figure 5) or underwater museums.
Figure 5. The sculptures of Jason deCaires Taylor are leading a new movement of underwater art that is driven by environmental and social issues.
These are often designed and implemented with active participation and support from local communities and agencies responsible for conservation of underwater environments.

What underwater sculptures are proposed for the Whitsundays?

Six proposed sculptures were selected from a global Expression of Interest for the Whitsunday Reef Recovery and Public Art Project. The common theme selected for the underwater sculptures was marine species. Details of the proposed Sculptures and the Artists are in Table 2 and 3. Artists commenced work in September 2018 and works are expected to be completed between Feb-May 2019.

Table 1. The Sculptures

<table>
<thead>
<tr>
<th>Bwya - Brian Robinson</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is a dreamtime story about the reef, creation and marine life. Concrete and stainless steel: 1.8m x 3.2m</td>
</tr>
</tbody>
</table>
Anthozoa - Arts Based Collective
Anthozoa is a 20,000 times sculpture of a single coral polyp Concrete: 4m x 5m x 4m

Maori Wrasse - Adriaan Vanderlugt
A Maori wrasse with distinctive facial tattoos will create habitat for attached marine life Aluminum: 2.4m x 3.9m x 1m
**Manta Ray - Adriaan Vanderlugt**
A single Manta Ray with indigenous markings, Aluminum: 1m x 3.6m x 2.5m

**Migration of the Mantas - Brian Robinson**
Seven large Manta Rays will appear to be schooling, Concrete and stainless steel: 4m x 6m
Turtle Dream - Col Henry
An interactive hawksbill turtle creating habitat and enjoyment. Stainless steel: 6m x 5m x 3m
Brian Robinson
Brian Robinson is of the Kala Lagaw Ya and Wuthathi language groups of the Torres Strait and Cape York Peninsula. Born on Waiben (Thursday Island) and now Cairns-based, Robinson is known for his printmaking and public sculptures in which he uses a variety of techniques to produce bold, innovative and distinctive works. An evolving repertoire of imagery is grounded in his childhood in the tropics, Indigenous heritage and dynamic imagination. The intense colour and lively three-dimensional sculptural forms, which has built his reputation are influenced by the fecundity of growth that characterizes Queensland.

Adriaan Vanderlugt
Adriaan has been creating sculptures since 1969, almost always with a wildlife theme and exploring the mediums of stone, bone, marble, wood and metal. He has travelled to many venues for both solo and group exhibitions. In 2001, he created on site Limestone sculptures in public, as one of three artists in the Whitsunday Sculpture Symposium at Airlie Beach and was the invited artist for the Coast to Coal Sculpture Symposium, working with local mediums and endangered species in Mackay, Nebo, Moranbah, and Clermont while mentoring local assistants at each location. He was awarded the Centenary Medal for distinguished service to the arts.

Col Henry
Col Henry, born 1947 in Gosford, NSW, lists his main qualification as a ‘Long and Diverse Life Experience’. The artist has many art and education related degrees, diplomas and certificates including welding, industrial foundry, panel beating, spray painting, trade and industrial management. He has a vast and diverse experience in industry and construction. Full Time TAFE Teacher for 23 years, retiring to full time Sculptor in 1995.

Arts Based Collective
Caitlin Reilly, Jessa Lloyd and Kate Ford are the ‘Arts Based Collective’. Caitlin is an Australian born multi-disciplinary artist living in Byron Bay, Australia. She has participated in many solo and group exhibitions in both China and Australia. Jessa is an artist and curator based in the Whitsundays who is passionate about the arts, environment and culture, and the role all three have in shaping community. Kate Ford is an artist who draws inspiration from the natural environment particularly as it pertains to fragility and sustainability.
Where are Underwater Sculptures to be installed?

The preferred installation locations of the public art sculptures in the Whitsunday region has been selected by scientists in consultation with the tourism industry, stakeholders and engineers. A total of six underwater sculptures are proposed to be installed at four sites: Blue Pearl Bay (2 sculptures), Manta Ray Bay (2 sculptures), Langford Reef (1 sculpture) and Horseshoe Bay (1 sculpture) in the Bowen-Whitsunday region (Figures 6, 7, 8, 9 Table 3).
These sites were selected based on a number of criteria. Prior to Cyclone Debbie, these sites hosted high visitation rates which have dramatically decreased since the incident. During site assessments, most sites demonstrated reasonable fish populations which will complement any additional attractions. Substantial infrastructure already exists by way of moorings and reef protection markers to support the return of visitors and protect on-going ecological values. Ecological values will further be enhanced at Blue Pearl and Manta Ray Bay, by complementary reef restoration activities. All sites have substantial areas of sand and rubble, surrounded by areas with low coral cover, suitable for the deployment and anchorage of underwater installations.
Figure 9. Google Earth images of proposed and previously permitted sculptures at Langford Reef (Turtle Dream) (top) and Horseshoe Bay, Bowen (Bywa) (below)
What underwater sculptures have been installed in the Whitsundays?

Four underwater sculptures of fish, nudibranch and a crab (Figure 10,11) were temporarily installed at Langford Reef in 2018 to research what visitor perceptions were of the artwork, and art installations in general in the Great Barrier Reef World Heritage Area.

![Figure 10: Underwater sculptures temporarily installed at Langford Reef in 2018](image)

Table 3: Proposed specific locations for installation of sculptures

<table>
<thead>
<tr>
<th>Sculpture</th>
<th>Island/Reef</th>
<th>Marine Park Zone</th>
<th>Objectives of the zone</th>
<th>GPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthozoa</td>
<td>Blue Pearl Bay</td>
<td>Marine National Park Zone (MNPZ)</td>
<td>a) To provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; and (b) subject to the objective mentioned in paragraph (a), to provide opportunities for certain activities, including the presentation of the values of the Marine Park, to be undertaken in relatively undisturbed areas.</td>
<td>S20.043413°, E148.881915°</td>
</tr>
<tr>
<td>Maori Wrasse</td>
<td>Blue Pearl Bay</td>
<td>MNPZ</td>
<td></td>
<td>S20.043477°, E148.881647°</td>
</tr>
<tr>
<td>Manta Ray</td>
<td>Manta Ray Bay</td>
<td>MNPZ</td>
<td></td>
<td>S20.060988°, E148.95601°</td>
</tr>
<tr>
<td>Migration of the Mantas</td>
<td>Manta Ray Bay</td>
<td>MNPZ</td>
<td></td>
<td>S20.060839°, E148.955901°</td>
</tr>
<tr>
<td>Turtle Dream</td>
<td>Langford Reef</td>
<td>MNPZ</td>
<td></td>
<td>S20.083417°, E148.881294°</td>
</tr>
<tr>
<td>Bwya</td>
<td>Horseshoe Bay</td>
<td>General Use Zone</td>
<td>To provide for the conservation of areas of the Marine Park, while providing opportunities for reasonable use.</td>
<td>S19.979342°, E148.262041°</td>
</tr>
</tbody>
</table>
A short-term research experiment conducted by Reef Ecologic between August and November, 2018 at Langford Reef in 2018 explored social attitudes to art in the Marine Park. Preliminary results from these surveys highlight a variety of responses and opinions.

Over the course of the research period we received 446 submissions from the two survey methods. 26 long surveys and 420 short surveys were completed. 60% or 265 responses were female and 40% or 176 respondents were male. 37% of all respondents are of Australian nationality with the remaining 63% overseas visitors. 23% of all respondents reside in the Whitsundays region.

Seventy percent (70%) or 292 people strongly agreed with the statement that ‘Installing art in damaged Great Barrier Reef (GBR) sites is a good idea for assisting reef restoration and tourism’ (Figure 12a).

“Excellent opportunity to enhance our natural environment and remove pressure from recovering reefs”.

54% of respondents felt the art installations should be interactive Figure 12b) however some comments suggested conjecture around interaction (being able to simply swim around the sculptures) and actively engaging (touching and sitting or grabbing sculptures).
One respondent commented

“I think it would be a great idea and I’m a massive fan of being able to get up close to the sculptures for photos and promotions (as long as it was safe to do so). I am not a fan of people being able to touch the sculptures as you would hope in the future organisms would grow on them but it would be very difficult to police.”

“education is essential as artificial reef can offer ecosystem services through time but only if not disturbed.”

Most respondents strongly agreed that art installations should be underwater (52%, 217) (Figure 12c) in preference to on land (10% or 44 respondents) or intertidal (16% or 68 respondents).

Respondents overwhelmingly agreed that Art installations in the GBR are only a good idea if they also raise awareness about the Reef with 71% or 292 people strongly agreeing with this statement (Figure 12d).

“Art works that can create awareness and work with the Reef in creating new coral sights would be recognised worldwide”.

“The Great Barrier Reef is dying, we need to raise awareness but also need to keep attracting tourists to keep the community going”.

How big are the sculptures?

It is often difficult to ascertain how big the planned sculptures will be compared to other structures. One way to reference the size of the sculptures is to think of the size of an average house. In Queensland the average footprint of a house is around 227m² (CommSec 2017, Figure 13). All the sculptures combined will result in a total footprint of around 90m². The smallest footprint of all the installations is Bywa, measured at 3.24m² which is smaller than an average bathroom. The largest installation, Turtle Dream proposed for Manta Ray Bay is likely to cover some 30m², or the area of a medium living room.

![Comparison of the footprint of an average Queensland house in comparison to planned art installations and sculptures for the Whitsundays.](image)
What are the environmental risks and benefits?

Underwater art projects have the potential to deliver significant benefits to a region, they can also present risks if not properly designed, installed and managed. Environmental tourism is widely recognised as a ‘double-edged sword’ in that it can bring valuable revenue to businesses and local communities, but it can also lead to increased pressures on fragile or valuable habitats. Key areas of concern are environmental impacts, visitor safety and destination reputation.

Underwater art installations can also provide new habitat for marine plants and animals, increasing local biodiversity and providing convenient concentrations of marine life for observation by visitors. This is particularly beneficial in the Whitsundays area, where large amounts of structural habitat was removed during TC Debbie. The sculptured forms attract corals, sponges, hydroids, increasing overall reef biomass and aggregating fish species, which in turn can support an entire marine ecosystem.

What are the social risks and benefits?

Underwater art is relatively recent and a very popular way for people to explore, learn and be inspired by the marine environment, science, education, art, management, issues and solutions. Underwater art has a huge appeal and “wow” effect on locals, visitors and tourists. It is hard to explain the attraction of underwater art as it means different things to different people. Two measures of the success of art are the attraction of large number of visitors to sites and the high satisfaction of visitors. Underwater art is subjective and some designs and artists are disliked by some people and a segment of the community prefer a natural experience without man-made attractions or other people.

There is the potential that Tourists may go out of their way to have photos taken beside underwater artistic pieces. Underwater sculptures encourage engagement and social media promotion. Underwater sculptures like tourism pontoons, snorkel trails and shipwrecks may provide opportunities to reduce volumes at some iconic locations in the Whitsundays (such as Whitehaven Beach) by distributing visitation to other areas.

Underwater art can educate and engage visitors in the problems and potential solutions facing our underwater ecosystems. Increasingly, underwater works of art seek to encourage environmental awareness, instigate social change and lead visitors to appreciate the breathtaking natural beauty of the underwater world. Through complementary interpretation centres, trained guides and thoughtful design of both artworks and experiences, underwater art can convey important messages about the threats to ocean systems, our deep-rooted dependency on healthy ecosystems, and the opportunities to act to improve their outlook. These experiences can expand and fortify the foundations of public support for marine management, and empower citizens to contribute to collective actions that are necessary to rebuild the resilience of vital habitats such as coral reefs.

What are the economic risks and benefits?

In Australia, tourism generates approximately $11.2 billion of direct expenditure per annum for Queensland and $6.4 billion per annum for the Great Barrier Reef (Perry, 2017). More than 22 million tourists visit Queensland of which more than 2 million people visit the reef each year, many spending one or more days snorkeling or diving.
Underwater art installations, especially those characterized by large scale and high-quality art works, have the potential to be significant economic developments. Previous examples, such as the underwater museums in Grenada, Bahamas and Mexico, have generated a range of unique opportunities to generate revenue that can be reinvested in the community, the management of the attraction and the conservation of the ecosystem. Two of the largest value streams associated with underwater art come from the increased tourism activity and increased media coverage.

Tourism activity generates direct economic benefits through entrance fees, merchandise sales and increased demand for marine tourism providers. Attracting approximately 250,000 visitors per year, the $5 entrance fee was enough to generate $1,000,000 to support ongoing management and maintenance of the MUSA in Mexico. Additionally, by increasing the appeal of a tourism destination and attracting increased tourism (Figure 6), underwater art installations can lead to significant flow-on benefits to businesses providing tourism services, including hotels, restaurants, public transport and retail outlets.

The introduction of underwater art will support increased visitation and tourism activity in the region enhancing the appeal of degraded sites and providing, new, unique experiences for visitors to the Whitsundays. These activities will support tourism and economic recovery and stability in the region.

How will the environmental, social and economic risks be managed and monitored?

The project team have documented a risk assessment for the installation of underwater sculptures and determined that risk events associated with legislation, environmental impact, social impact and economic resources are low and acceptable (Table 4).

### Table 4. Whitsunday Reef Recovery and Public Art project risk assessment

<table>
<thead>
<tr>
<th>Risk Event</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Risk Rating</th>
<th>Risk Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inability to complete project because of legislation</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>- Scoping, communication and partnerships</td>
</tr>
<tr>
<td>Inability to complete because of environmental impact</td>
<td>Very Low</td>
<td>Low</td>
<td>Low</td>
<td>- Site selection &lt;br&gt; - Scoping &lt;br&gt; - Partnerships &lt;br&gt; Installation by marine construction and salvage expert &lt;br&gt; - Selection of construction seasons &lt;br&gt; Certified engineer</td>
</tr>
<tr>
<td>Impact of sculptures on environmental, social or heritage values of the GBRMP and GBRWHA</td>
<td>Very Low</td>
<td>Low</td>
<td>Low</td>
<td>- Planning &lt;br&gt; - Extensive community consultation</td>
</tr>
<tr>
<td>Inability to complete because of social impact</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>- Government priority &lt;br&gt; - Community support &lt;br&gt; - Monitoring and surveys</td>
</tr>
<tr>
<td>Inability to compete due to economic resources</td>
<td>Very Low</td>
<td>Low</td>
<td>Low</td>
<td>- Grants &lt;br&gt; - In-kind support</td>
</tr>
</tbody>
</table>

NB: Additional detailed risk assessment available in appendices.
The underwater art and reef recovery projects will be monitored by scientists and citizen scientists. We propose to monitor a suite of ecological (fish, coral and benthic diversity on and around the sculptures), socio-cultural (satisfaction, stewardship, visitation) and economic indicators (increase in tourism, visitation and the economic value of these) as suggested by Hein et al.2017 (Figure 14). The structures themselves will be monitored for wear and tear to ensure they remain safe, stable and intact. We will monitor the sculptures following significant weather events such as cyclones to ensure that they have not been damaged or moved.

Effective management tools to mitigate the potential risks of underwater art include risk assessment, site selection, appropriate signage and briefings to educate visitors about best practice and their potential damaging activities. We recognise that there are potential risks associated with installation and ongoing operation of structures such as underwater art. We have carefully selected the sites for the location of underwater sculptures to prevent any damage to aquatic habitats such as coral or seagrasses. We will further reduce risk during installation by using expert marine contractors, select suitable calm weather and inviting supervision from management agencies such as GBRMPA and QPWS. One study of snorkeling behaviour exhibited a five-fold decrease in potentially damaging behaviours by providing pre-visit education and asking visitors to make pledge to act in ways that support reef health (Webler & Jakubowski 2016). Informational material, such as signs and underwater slates are a useful management tool to increase knowledge and best practice behaviour.
How are underwater sculptures be installed and decommissioned?

Underwater sculptures are installed by commercial vessels and expert teams to ensure safety, environmental, social-cultural and economic values. The size and weight of the sculptures are relevant to the selection of vessel, crane and installation method. Prior to installation the proposed locations will be temporarily marked with underwater buoys and inspected and approved by Queensland Parks and Wildlife Service. The sculptures will be installed during calm weather by professional salvage operators with barges and cranes (Figure 15). We have utilised the expertise of David Edge Marine Contracting and Whitsunday Moorings for the installation and decommissioning of the sculptures at Langford Reef in 2018. We proposed to utilise local experienced contractors for the installation and engineering certification of the six sculptures in 2019. The sculptures and footings (comprising concrete stands) or anchors will be placed on sand or bare substrate in approximately 4-8 metres of water. An Environmental Management Plan will be prepared by Reef Ecologic and the contractor to guide installation and decommissioning processes, management post storms or rough weather to ensure the activity is low risk.

What are the timeframes?

Reef Ecologic lodged an application for a Joint GBRMPA and Queensland Parks and Wildlife Service (QPWS) Permit with the Great Barrier Marine Park Authority (GBRMPA) in October 2018. Assessment of the application includes a public information period of 20 business days giving the public an opportunity to understand and comment on what Reef Ecologic are proposing.

Following this period and the provision of any further information GBRMPA requires, Reef Ecologic will lodge a separate application for a permit under the Environment Protection (Sea Dumping) Act for placement of the sculptures at the locations. Subject to a successful outcome to Reef Ecologics’ permit applications, we would be in a position to install sculptures in mid-2019. This would depend permissions and approvals and on the availability
of completed artworks and commercial vessels with cranes.

Who has been engaged and consulted?

Between May - Dec 2018 the Reef Ecologic project team and two key partners Tourism Whitsundays and Whitsundays Regional Council have consulted widely with government, industry, tourists, scientists, artists, Traditional Owners, media, community and technical experts to seek advice about the project. The consultation to date has involved meetings, festivals, field trips, presentations, media articles, communiques and videos. We have developed a consultation logbook of over 500 consultation actions involving over 1400 stakeholder people\organisations.

Site selection, locations, artistic designs have been some of the primary topics of discussion during consultation. Stakeholders agreed that sculptures were preferable underwater and should be installed at previously popular locations where people used to go, but have changed destinations due to the degraded state of those reefs.

A list of the organisations consulted to date includes:

- Great Barrier Reef Marine Park Authority
- Queensland Parks and Wildlife Service
- Department of Innovation, Tourism and Industry Development
- Whitsunday Regional Council
- Maritime Safety Queensland
- Queensland Fisheries
- Citizens of the GBR
- Order of Underwater Coral Hero’s
- Reef Check Australia
- James Cook University
- Australian Institute of Marine Science
- CSIRO
- Tourism Whitsundays
- Whitsunday Charter Boat Industry Association
- Whitsundays Local Marine Advisory Committee
- Healthy Rivers to Reef Partnership- Mackay-Whitsundays
- Arts Queensland
- Mackay Artspace
- Bowen Collinsville Enterprise
- Whitsunday Reef Festival
- Hamilton Island Enterprises
- Edges Boatyard
- Summertime Whitsundays
- Ocean Rafting
- Whitsunday Getaways
- Red Cat Adventures
- Explore Whitsundays
- G W Goddard & Associates
- Proserpine Indigenous Reference Group
- Ngaro Traditional owners
- Proserpine State High School
Will the sculptures impact access by other marine park users?

During installation and removal there may be some disruption to access at specific sites. We anticipate this disruption to be between 2-6 hours for each installation. Once installed, the public sculptures will not impact access to other marine park users and will be available for all people. During extensive consultation there have been no concerns about negative impact of the sculptures on access of marine park users. We predict that the sculptures will be of particular interest to tourists and students and will increase visitation to the proposed locations.

Where do I go for more information?

General information on underwater sculptures can be obtained by viewing the 2015 TEDx talk ‘An underwater art museum teeming with life’ by Jason deCaires Taylor which has been viewed by over 1.5M people. [https://www.ted.com/talks/jason_decaires_taylor_an_underwater_art_museum_teeming_with_life?language=en](https://www.ted.com/talks/jason_decaires_taylor_an_underwater_art_museum_teeming_with_life?language=en)


More specific project information on this project, the Whitsunday Reef Recovery and Public Art is available on the website [www.reefecologic.org/project/wrap/](http://www.reefecologic.org/project/wrap/). The website includes results of Reef Health Impact Surveys, media releases, interviews, videos, communiques and brochures from 2018-19.

More information and a display of the four sculptures that were installed at Langford Reef in 2018 will be available at the Big Mango Visitor Information Centre, Lot 236 Bruce Highway, Bowen, Qld 4805
Further frequently asked questions

**Will there be an extra cost to see the underwater sculptures?**
No. The sculptures are public art and are freely accessible for all Marine Park visitors at no cost.

**Can I go SCUBA diving and snorkeling at the sculpture sites?**
Yes. SCUBA diving and snorkeling are encouraged and a great way to view the underwater sculptures at the proposed sites. Some sculptures will be more suitable to snorkeling while others will be more enjoyable on SCUBA.

**Can I go fishing or spearfishing near the sculptures?**
No. The sculptures are located within the Great Barrier Reef Marine Park and in these specific locations of Manta Ray Bay, Blue Pearl Bay, and Langford Reef there is no fishing or spearfishing allowed due to zoning and planning arrangements. Under Queensland fisheries legislation additional spearfishing closures have been declared from the foreshores and waters seaward 50m from low water mark from the boat ramp in Greys Bay around Cape Edgecumbe to the eastern headland of Horseshoe Bay.

**Can I touch the underwater sculptures?**
Yes, you can touch the sculptures. However, we would prefer you to look and don’t touch as there will be some marine life growing on the sculptures. Over time the sculptures will accumulate marine life as corals and other life forms attach to them making the sculptures more difficult to touch and interact directly with. This, however, will make the sculptures more interesting and ecologically more integrated into the local environment.

**Is it safe for visitors to interact with underwater sculptures?**
Visitor safety is a key consideration and the design of individual pieces to avoid entanglement and entrapment. The location, arrangement, and the method of installation are all important considerations to ensure minimal risk to visitors. The potential safety issues associated with marine life (sharks, stingers) and weather (currents, visibility), vessel traffic and snorkeling\SCUBA activities must be considered and managed.

**Will cyclones or extreme weather damage the underwater sculptures?**
The sculptures have been placed in sheltered waters, secured with anchors and have been certified by an engineer to withstand a category 3 cyclone.

**Who owns the sculptures and who is responsible for them long-term?**
The sculptures are owned by Whitsundays Regional Council and they will be responsible for their care and maintenance.

**What happens if sculptures are damaged?**
If the sculptures are damaged, they will be assessed and a decision made by Whitsundays Regional Council in consultation with the artist and GBRMPA to accept, repair or remove the sculpture.

**Who will be responsible for ongoing maintenance of the sculptures?**
Whitsundays Regional Council in consultation with the artist will be responsible for ongoing maintenance of the sculptures.
What can citizens scientists do to help with research and education?

Citizen scientists can assist by monitoring the habitats and species in the vicinity of the sculptures. We encourage GBRMPA Eye on the Reef monitoring protocols. You can learn more about Eye on the Reef at http://www.gbrmpa.gov.au/our-work/our-programs-and-projects/eye-on-the-reef. We also encourage sharing of photographs on social media and discussions about the environmental, social and educational benefits of underwater sculptures to raise awareness of issues and solutions.

References


Tourism and Events Queensland (2017). Whitsundays Regional Snapshot- to June 2017. https://cdn1-teq.queensland.com/~/media/6e6ef26b04c483f3ad366faa6a4d8150.ashx?vs=1&d=20171019T145127

## Risk Assessment; Whitsundays Public Art Installations as Part of Whitsundays Public Art and Reef Restoration Project

**Activity:** Installation of public art (sculptures) at multiple locations within the Great Barrier Reef Marine Park  
**Location:** Langford Island Reef (Reef ID: 26-029), Manta Bay Reef (Reef ID: 26-028b), Blue Pearl Bay (Reef ID: 220-014) (Marine National Park zone) and Horseshoe Bay (General Use Zone)  
**Risk Method:** Risk Assessment-Permission System

### Activity or Element | Hazard | Factors | Initial Risk | Mitigation/Adaptive Management Response | Post Management Risk
--- | --- | --- | --- | --- | ---

### Biodiversity valves/physical factors  
**Damage to surrounding environment during installation or removal of sculptures (including benthics)**  
- Installation vessel may bump into and damage reef  
- Mortality of individual colonies from physical damage.  
- Sculptures could be placed/disposed damaging reef  
- Location of proposed installation  
- Presence of sensitive benthos  
- Method of installation  
- Size of equipment  
- Experience of installation team and organisation  
- Moderate x Possible = Medium (3.0)  
- Installation methods have been selected to ensure minimal impact is caused. To ensure no damage is caused to corals, installation is proposed on bare coral rubble and sand only.  
- Sites will be scoped, surveyed and approved in consultation with management agencies.  
- Stakes will be inserted to outline each area and to ensure that the installation is within the proposed area.  
- Minor x Unlikely = Low (2.0)

**Introduction of harmful substances**  
- Installations could introduce harmful chemicals as part of the development of the sculptures  
- Introduction of contaminants from construction process  
- Lethal and sub-lethal effects on the local species  
- Material used for construction of installations  
- Moderate x Possible = Medium (3.0)  
- Sculptures have been designed using materials that are not expected to pollute or leach into the water column. This includes cement and stainless steel.  
- Artists have extensive experience in the development of public art and extensive consultation has confirmed acceptable materials for sensitive marine environments  
- Minor x Unlikely = Low (2.0)

**Disruption of installations (becoming destructive marine debris)**  
- Equipment is not appropriately installed, adequately maintained resulting in physical damage to the benthic marine environment.  
- Research equipment may become damaged or detached during a cyclone as a result of severe water movement.  
- Abandoned equipment reduces the aesthetic values of the reef and the conduct of others.  
- Amount, size and type of equipment  
- Method of installation, operation or removal of equipment  
- Level and frequency of monitoring and maintenance of equipment  
- Improper deployment  
- Experience of installation team  
- Moderate x Possible = Medium (3.0)  
- Securing methods have been proposed that ensure they are installed appropriately based on the size of the sculptures and the environment at the proposed locations.  
- Ongoing maintenance checks will ensure these are adequate  
- Sculptures are heavy and have been designed to allow water flow through and not create a ‘barrier’ easily flushed by surge or swells  
- Requirement for engineering certification  
- Minor x Unlikely = Low (2.0)

**Visual census and monitoring**  
- Abandoned equipment reduces the aesthetic values of the reef and the conduct of others.  
- Damage to the adjacent environment (disturbance to marine life caused by divers, snorkellers).  
- Type and proposed use of equipment  
- Experience and ability of divers/ snorkellers  
- Educational materials developed as part of the project  
- Negligible x Possible = Low (1.0)  
- Condition requiring attendance of transect tapes, quadrats and video monitoring equipment for visual and video census at all times.  
- No equipment (other than primary installations) to be left unattended  
- Condition requiring project reporting  
- Capacity building initiatives (including videos, pamphlets and flyers) to be provided to local tourism operators to assist with management of human interactions with installations. Local tourism operators to provide guidelines for visitors swimming around the installations.  
- Negligible x Unlikely = Low (2.0)

**Cyclones and storms**  
- Physical destruction of installation  
- Physical damage to surrounding benthics  
- Detachment of installation  
- Amount, size and type of equipment  
- Method of installation, operation or removal of equipment  
- Level and frequency of monitoring and maintenance of equipment  
- Improper deployment  
- Experience of installation team  
- Moderate x Possible = Medium (3.0)  
- Installations conducted outside of cyclone season  
- Methods of attachment suitable to withstand high energy environments  
- Experience of the installation team  
- Requirement for engineering certification  
- Minor x Unlikely = Low (2.0)

**Biological factors**  
**Overgrowth by benthic organism**  
- Type of material installations are made of  
- Predation by other grazers (urchins, herbivorous fish)  
- Prevalence of benthic organisms  
- Installations with suitable substrate for recruitment  
- Positive x Almost certain = Low (1.0)  
- Installations will be [for the most part] designed to recruit benthic organisms  
- Benthic overgrowth may enhance biodiversity values and interest  
- Positive x Almost certain = Low (1.0)

**Habitat by marine life**  
- Fish, invertebrates and other life  
- Complexity and design of installations  
- Installations with suitable substrate for recruitment  
- Complexity of structures  
- Positive x Almost certain = Low (1.0)  
- Installations will be [for the most part] designed to recruit benthic organisms  
- Benthic overgrowth may enhance biodiversity values and interest  
- Installations designed to be complex with spaces and niches for habitat  
- Positive x Almost certain = Low (1.0)
<table>
<thead>
<tr>
<th>Social values</th>
<th>Local anthropogenic impacts</th>
<th>Aesthetics of the site are compromised</th>
<th>Stakeholder access</th>
<th>Traditional Owner values</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Lack of control over anthropogenic impacts at the site.</td>
<td>- Use of site</td>
<td>- Use of site</td>
<td>- Lack of understanding or knowledge of the project</td>
<td>- Historic connections to the Reef and region</td>
</tr>
<tr>
<td>- Unsupervised interaction between visitors and installations/experiment.</td>
<td>- Unsustainable activities</td>
<td>- Degradation of visual amenity</td>
<td>- Stakeholder dissatisfied at installations and limitation to access.</td>
<td>- Historic connections to the Reef and region</td>
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<td>- Experience and acuity of divers/skin divers.</td>
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<td></td>
<td>- Educational materials developed as part of the project</td>
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<td>- Historic connections to the Reef and region</td>
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<td>- Moderate x unlikely = Low (10)</td>
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<td>- Responsible reef practices implemented by local operators.</td>
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<td>- Installation attached to substrate, entanglement threats minimized by installation methods.</td>
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<td>- No entrainment stresses.</td>
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<td>- Capacity building initiatives (including videos, pamphlets and flyers) to be provided to local tourism operators to assist with management of human interactions with installations. Local tourism operators to provide guidance to visitors swimming around the installations.</td>
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<td>Minor x Unlikely = Low (7)</td>
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<td>- Underwater art does not impact on those outside the water and those wanting a natural environment can go elsewhere.</td>
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<td></td>
<td>- Installations designed by professional artists with strict aesthetic guidelines that have been broadly accepted through extensive community consultation.</td>
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<tr>
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<td>Moderate x Possible = Medium (13)</td>
<td></td>
<td>Minor x Unlikely = Low (7)</td>
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<td>- Closures restricted to installation times. Likely to be less than 1 day per site.</td>
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<td>- Extensive consultation has resulted in widespread community support for the project.</td>
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<td>- Communication of proposed closures will be provided to local operators to ensure they are aware and can choose alternative locations on installation days.</td>
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<td>Minor x Unlikely = Low (7)</td>
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<td>- Installations designed by professional artists one of whom is a Traditional Owner (not from the Whitsundays).</td>
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<td>- Two other artists designing installations designed by professional artists in conjunction with local Traditional Owners.</td>
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<td>- Extensive consultation has been undertaken with the Whitsunday Traditional Owners through the Whitsunday Indigenous Reference Group (WIRG) and the Whitsunday Traditional Owner Reference Group (TORG) of the local Reef Catchments HPR.</td>
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<td>- Letter of support has been received and signed by Traditional Owners.</td>
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</tbody>
</table>

*Note: Positive outcome is not actually listed on risk matrix however it is listed as a severity rating on the ‘Risk Assessment - Permission System guideline.*

Note: This risk assessment has been completed by the applicant (reef Ecologic) and a separate risk assessment by GBRMPA will occur during the assessment of the Marine Parks permit application.