



Strategic analysis of emerging opportunities for development of underwater tourism in the Great Barrier Reef and Queensland



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1. Executive summary

In the past 50 years there has been a significant growth in the pursuit of water-based experiences for sport, leisure, recreation, and tourism. Internationally, there is an emerging trend toward “value adding” by offering interactive and educational tourism and recreational experiences. These include learning opportunities (educational signage, snorkel trails, learning trails, citizen science, edu-tourism) and immersive experiences such as underwater art.

We reviewed international and Australian projects associated with underwater snorkel trails and underwater art. Our review found no comprehensive national, state or local policies or guidelines to assist proponents who wish to plan, install or manage a facility such as a snorkel trail or underwater art project. There are however guidelines for artificial reefs, facilities, sea dumping and sea installations which are useful for some environmental processes.

We developed a conceptual model of key processes and issues for underwater art and snorkel trails that has six stages: Scoping, Consultation, Resources, Assessment, Construction and installation and Ongoing Management. In our review of seven potential underwater art projects proposed between 2012-2017 in Queensland, two art installations have completed these six stages. In our review we determined that the majority of proposed underwater art projects in Queensland are at the early Scoping Stage or have stalled due to resource or assessment issues.

The world’s leader in the field of underwater art sculptures is Jason deCaires Taylor who has completed projects in the Caribbean, Mexico, Spain, Bali and he has been contacted and consulted on several potential projects in Queensland. We provide a description and lessons learned in engaging Jason deCaires Taylor to design the Museum of Underwater Art (MoUA) offshore from Townsville.

On a smaller scale we provide a description and lessons learned in designing and consulting on a reef interpretative sign for a snorkel trail at Geoffrey Bay, Magnetic Island.

We provide a strategic concept for the Great Barrier Reef Underwater Learning Trail which links signage, snorkel trails, education, research, management and the MoUA into a regional attraction and facility. The Great Barrier Reef Underwater Learning Trail incorporates world-class science, education and management of GBRMPA, AIMS, JCU and world class diving such as the *Yongala* shipwreck, Great Barrier Reef, Magnetic Island snorkel trails with the proposed MoUA.

By actively contributing to the planning and scoping processes for the Museum of Underwater Art (MoUA) project and planning, consultation and approval for a reef interpretative sign in Townsville, we have ‘ground truthed’ principles and guidelines that can lay the foundations for a coordinated and efficient approach to future development of underwater art and snorkel trails throughout the wider Great Barrier Reef and Queensland regions.

2. International experiences relating to learning trails and underwater art

Context

Globally, marine recreation activities have an estimated participation of 121 million people with a direct economic value of US\$47 billion and support more than 1 million jobs (Cisnereros-Montemayor and Sumalia, 2010). SCUBA diving and snorkeling are particularly important marine-based tourism activities and are amongst the major commercial uses of Marine Protected Areas (MPAs) around the world.

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 snorkel trails and underwater art are 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 snorkel trails

Snorkeling allows people to visit underwater cultural and natural structures, permitting direct human interaction with the environment, and acting as an excellent tool for environmental education. In some cases underwater snorkeling trails are a tool for attracting and concentrating snorkelers. There has been limited previous literature review of snorkel or learning trails. The design and implementation of snorkel trails and reliable data on these activities is scarce, and most scientific research can only be found in “grey literature” (e.g. project reports) or are not available to the wider public.

It is believed that the first snorkel trail in the world was constructed in South Africa in 1964 and the first snorkel trail in Australia was proposed in 1985 and installed at Gordon’s Bay in 1990 (Table 1). Internationally we have found examples of snorkel trails in many countries including America, France, Britain, South Africa, Portugal, New Caledonia, Tahiti and Scotland (Table 1). There are snorkel trails in every state in Australia and most of them are in Marine Protected Areas (Table 1).

Snorkel or underwater trails have benefits and impacts. Providing education and economic benefits to the local tourism industry are the primary motivations for the design and promotion of marine-based tourism experiences and associated infrastructure. Ensuring both increased visitation and enhanced visitor experiences is important to support the socio-economic development of the local community in the target destination. Another international study demonstrated a ‘high’ interest by visitors in receiving further education about reef ecology and in-water training, and respondents were willing to invest in such services (Hannak 2008). By encouraging engagement in marine monitoring exercises, visitors can contribute to citizen science programs and lead to positive behaviours after their trip due to their experience (Hansen 2016, Webler and Jakubowski 2016). Promoting stewardship activities could indirectly lead to increased involvement in local dive courses and further education in the marine environment and ecosystems. These further activities and spending have the potential to provide substantial economic benefits to the local community.

Direct diver or snorkeler impacts include trampling, fin contact, standing on corals and re-suspension of sediment (Chabanet et al., 2005). The level of physical damage corresponds with visitor numbers. Recent studies report capacities between 4000 and 15,000 dives per site per year (Hannak et al. 2011). However, Plathong et al. (2000) noted that the establishment of a snorkel trail at Orpheus Island resulted in some physical damage to coral (Figure 1) despite limited use.

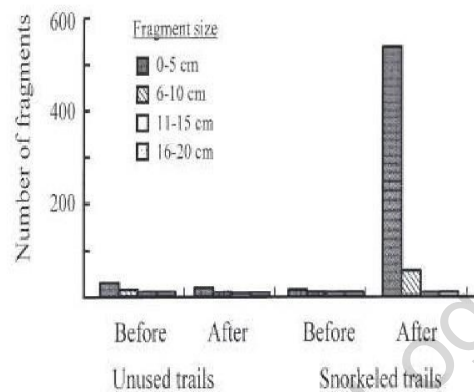


Figure 1 Size distribution of broken coral fragments at snorkel trails and unused trails before and after snorkelling began. Source: Plathong et al. 2000

In Trunk Bay, US Virgin Island’s the National Park Service suggests these snorkel trails can act as ‘sacrifice sites’ to protect surrounding areas. Concentrating snorkelers to a particular area can mitigate impacts by ensuring any damage to the benthic environment is concentrated to a smaller area than might be the case if snorkelers explore haphazardly over a broader area. Caution must be taken in promoting snorkel trails as sacrificial sites to ensure the mentality that any damage is acceptable. Properly educated and guided visitors do not necessarily have to result in increased damage. Providing education and improving understanding of snorkeler’s impacts can further mitigate any prospective damage as snorkelers approach the activity in a more cautious and considerate manner.

Table 1. Examples of snorkel trails in Australia and worldwide.

Name	Location	Proponent	Feature
Geoffrey and Nelly Bay	Magnetic Island, QLD	TOBMI	Giant clam, coral, wreck
Orpheus Island Snorkel Trail	Orpheus Island	Orpheus Island Resort	Built 2000, coral
Lighthouse, Shark pool, Channel one	Lady Elliot Island, QLD	LEI Eco Resort	Beginner, Intermediate, Advanced
Gordon’s Bay Underwater Nature Trail	Gordon’s Bay, NSW	Various dive shops and clubs	Built 1990, 600m long, Handicap access
Tinderbox Marine Reserve	Tinderbox, TAS	Parks and Wildlife Service	1993
Port Noarlunga Reef Dive Trail	Noarlunga, SA	South Australia Research and Development Institute	1994, 12 underwater markers
Jurien Bay, Parker Point	Rottneet Island, WA	Men’s Shed and Department of Sport and Recreation and the Department of Parks and Wildlife	2013, Beginner trails, 70 reef balls.
Coogee Maritime Trail	Cockburn, WA	City of Cockburn	On land and underwater. Reef and artworks. 33 reef modules.
Octopuses' Garden	Mornington Peninsula,	Parks Victoria	Beginner

trail	Vic		
Olbia archaeological underwater trail	Hyeres, France		Archaeology, 22 euros.
Florida Keys Shipwreck Trail	Florida Keys, America	National Oceanic and Atmospheric Administration	9 shipwrecks
Phil Foster Park Snorkel Trail	Riveria Beach, Florida	Palm Beach County	2013, rock and concrete modules, 3 hammerhead statues
North West Highlands Snorkel Trail	Scotland	Scottish Wildlife Trust	9 stops, 2017
Storms River Underwater Trail	Tsitsikamma, South Africa	National Parks	1964
Duck Island, underwater tunnel	New Caledonia	New Caledonia Tourism	UNESCO World Heritage Site
Marinha Beach, Algarve	Portugal		Interpretive signs along the route
Kimmeridge Bay snorkel trail	Kimmeridge Bay, United Kingdom	Dorset Wildlife Trust	5 buoys, Trail guide 3 pounds (online)
Reef Quest	Maupiti, Moorea, Tahiti	InterContinental Moorea Resort & Spa	2008, free
Mareto's Underwater Trail	Opunohu Bay, Moorea, Tahiti	Sea Turtle Observatory	2009, 5 stations



Figure 2 Example of double-sided slates for snorkel trail in Portugal. Rangel et al. 2015.

Snorkeling is a popular activity with people at a variety of swimming capabilities. Many locations have implemented multiple snorkel trails with options for people with various water skills and capabilities. Promoting trails that suit different swimming abilities provides opportunities for a broader target market. Providing guidance on the different opportunities available and the experience needed to participate provides risk mitigation to prevent accidents caused due to engagement by people with poor swimming and snorkeling capabilities. Lady Elliot Island Resort highlights three snorkel trail options for visitors specifically for people to self-evaluate their abilities.

Effective management tools to mitigate the effects of snorkelers include site selection, appropriate signage and briefings to educate visitors about best practice and their potential damaging activities. 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 (Figure 2). Most snorkelers recognized the value of briefings in proper behaviour and a well-trained snorkel guides. A trail was a clear reason for them to choose a snorkeling site, and they were willing to pay for a guide or a guidebook. Best management practice for snorkel trails involves a multi-pronged effort involving improved information, creating a snorkeling trail and incorporating the local population. Establishing no-use and multi-use areas, protecting “hot spot” areas and developing sustainable use would reduce threats, improve carrying capacity and provide economic benefits (Hanek et al. 2011).

Underwater art

Underwater sculpture parks or underwater art museums are artistic installations, usually involving sculptured works placed on the seafloor or riverbeds to provide fascinating visual, emotional and physical experiences for visitors. They usually require visitors to engage with the artworks through SCUBA diving or snorkeling, but intertidal installations provide opportunities for pedestrians or other non-swimming visitor to interact with the art works.

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. Many of the earlier installations were installed as tributes, recognising famous figures or honouring people lost in marine accidents. Others were installed to deter illegal fishing practices, or resulted from failed movie projects (Figure 3). 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.

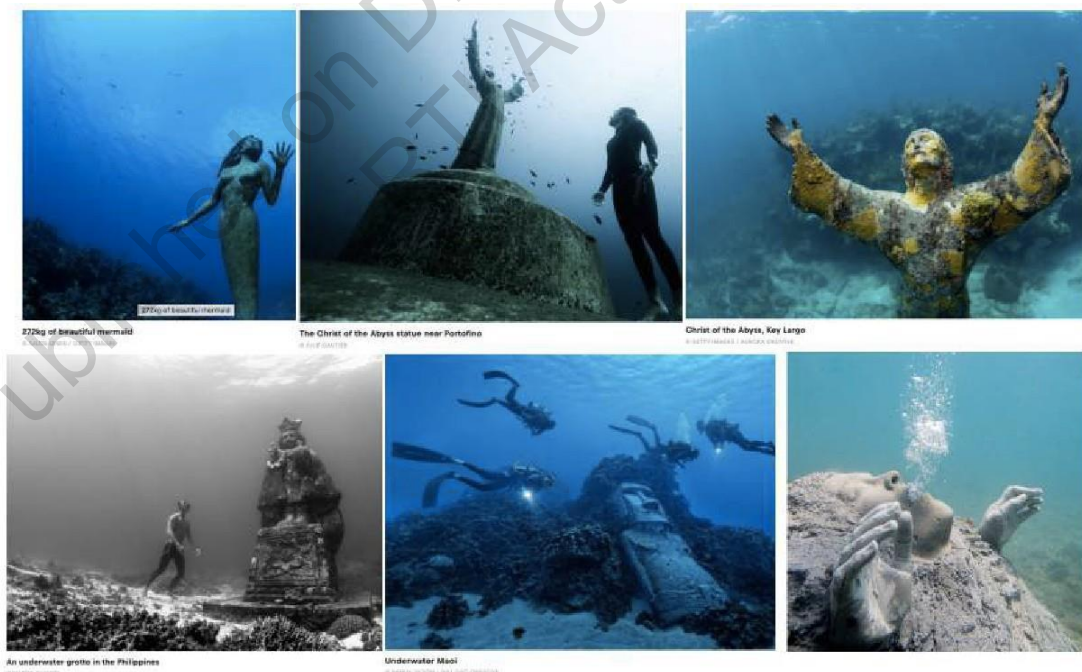


Figure 3. Early examples of underwater sculptures. Clockwise from top left: Mermaid sculpture installed by private resort in the Bahamas; Statue of Christ near Portofino; Christ of the Abyss at Key at Key Largo; Underwater grotto installed to reduce illegal fishing in the Philippines; a fake maori installed during a failed movie project is now a dive attraction off Easter Island; Community-installed sculpture in Thailand.



Figure 4. Underwater art on a new scale: underwater art museums by Jason deCaires-Taylor (top: Canary Islands; bottom: Mexico)

Recently, an important new underwater art movement has emerged with a strong focus on environmental issues and social engagement. Emerging from the Land Artists movement, these underwater art practitioners place environmental and social issues at the forefront of their art practice. This movement has spawned several major underwater art installations, taking the form of underwater museums or sculpture parks (Figure 4). These are often designed and implemented with active participation and support from local communities and agencies responsible for conservation of underwater environments.

A strong driver for the expanding interest in underwater art is the dramatic increase in public concern for the future of marine ecosystems, especially coral reefs. Around the world, coral reefs are facing unprecedented pressures, driving alarming deterioration and worrying impacts on local communities, businesses and broader society. Underwater art projects have emerged as an important contribution to the

social discourse on the importance of our oceans, their fragility, and the urgent need to address the causes of their deteriorating health.

Among the most famous and effective examples of this art form are works by Jason deCaires Taylor, who has installed major works in several northern hemisphere locations, including the Bahamas & Grenada (Caribbean), Cancun (Mexico), Canary Islands and London (Thames River). DeCaires Taylor's works represent the leading edge of the new movement of underwater art that is characterised by grand scale, bold concepts and close connection to the ecology of, and issues facing, marine environments (Figure 5).

Underwater museums have an essential role to play in fostering care and understanding of marine ecologies. Because of the brevity of most people's exposure to our ocean environments, the concerns of the oceans fall from the forethought of people's minds. Therefore, exposure of a wider audience to marine ecologies combined with the educative function of galleries, encourages prolonged thought on the condition of the environment and the role that humans can play in ensuring its continued health, or indeed its destruction.

Jason de Caires Taylor, leading international underwater artist



Figure 5. The works of Jason deCaires Taylor are leading a new movement of underwater art that is driven by environmental and social issues, and features works on an unprecedented scale.

Opportunities associated with underwater art installations

Underwater experiences are increasingly popular with more and more tourists looking for meaningful and informative opportunities to engage with destinations. This presents an enticing range of opportunities for regional development and social engagement on important issues such as nature conservation and climate change. However, like any development activity, snorkel trails and underwater art installations can also present risks if not carefully designed and implemented. This section reviews some of the key potential benefits (opportunities) and risks associated with these types of projects.

Underwater art installations are increasingly being proposed and developed to achieve specific aims relating to visitor attraction, economic development, tourism management,

habitat provision, education and engagement. These potential benefits mean that underwater art can be a valuable complement to marine ecosystem management and conservation, as well as contributing to the tourism economy of a region.

Visitor attraction and satisfaction

Underwater art has a huge appeal and “wow” effect on locals, visitors and tourists. It is hard to explain the attraction of art as it means different things to different people. Two measures the success of art are the attraction of large number of visitors to sites (Figure 6) and the high satisfaction of visitors (Figure 10).

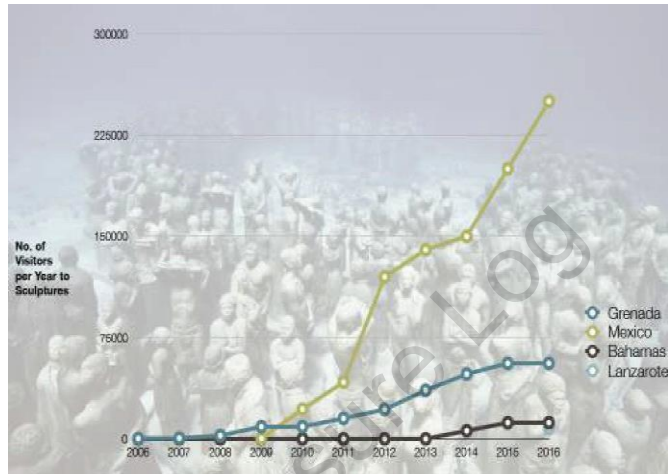


Figure 6. Visitor numbers to major underwater art installations by Jason deCaires Taylor. Note that Mexico is the largest of the collections, and has received very high exposure in international media.

Economic development

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.

Underwater art can also contribute to economic activity through extensive media coverage (often thought of as “free” advertising) that builds awareness and raises the public profile of a destination. Again, using the works of Jason deCaires Taylor (as his works are the only underwater art installations for which data are available on the various benefits), it is estimated that the projects in Grenada, Bahamas, Mexico and Canary Islands have collectively reached over 1 billion users on social media since 2006 (Figure 7).

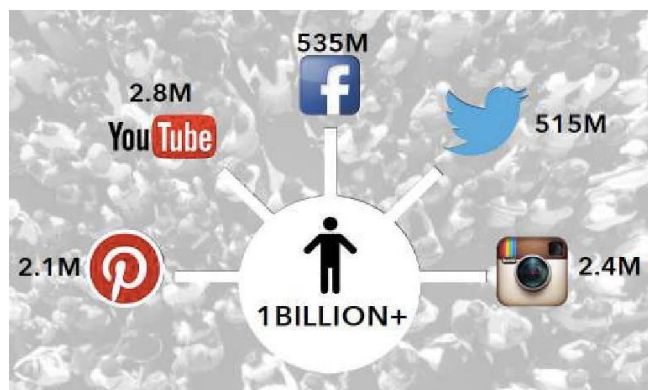


Figure 7. The global reach of underwater art projects by Jason de Caires Taylor across social media since 2006.

The economic value of this “earned media” was calculated for a temporary (2 month) exhibition of intertidal art installations in the Thames River, London to have exceeded \$1.5

M. As previous examples from the northern hemisphere demonstrate, the potential for economic revenue and positive public relations exposure clearly position major underwater art installations as projects of regional and national significance.

Tourism management

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 (Figure 8). All too often, this leads to degradation of the natural assets that underpin the tourism opportunities. In Mexico, underwater art has been successfully used to improve management of tourism pressure by providing an alternative experience for visiting divers. By diverting attention to underwater sculptures, natural reefs have now been given a greater chance to repair and to regenerate (see text box).



Figure 8. Some reefs are at risk of being "loved to death" through unsustainable tourism. Underwater art can help by relieving visitation pressure to nearby reefs.

Habitat provision

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. The sculptured forms attract corals, sponges, hydroids, increasing overall reef biomass and aggregating fish species, which in turn can support an entire marine ecosystem. Underwater artists applying best practices will design artworks using safe pH neutral materials, textured surfaces and protected spaces to create homes, breeding areas and shelters for a range of species (Figure 10). Some art works have been installed with the primary aim of attracting marine life to enhance tourism or fishing experiences, making them forms of artificial reefs. However, projects such as underwater museums can also be primarily art installations, with secondary benefits to marine life. Where there is an overt focus on art and the visitor experience (including education and engagement), and the works are designed to be removable, underwater art museums are best considered as tourist attractions or educational facilities, rather than reefs.

Education and engagement

Although more difficult to measure, perhaps the most valuable contribution that underwater art can make is to 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.

Risks associated with underwater art installations

While 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. Key areas of concern are environmental impacts, visitor safety and destination reputation.

Environmental benefits and impacts

Underwater art installations have the potential to cause a range of environmental benefits (Figure 9) and impacts if not carefully designed, installed and managed. Inappropriate materials used in construction can leach from the works, with the potential to contaminate surrounding environments and cause harm to surrounding species and habitats. Installation processes can involve heavy machinery (barges, anchors, piles) and extended underwater construction activity, all of which can cause physical damage to fragile habitats. If not well designed and maintained, art works have the potential to fall or move during storms, potentially causing serious damage to adjacent reef areas.

Visitor safety

As tourist attractions and educational facilities, visitor safety is a key consideration for underwater art installations. The design of individual pieces, location, arrangement, and their method of installation are all important considerations to ensure minimal risk to

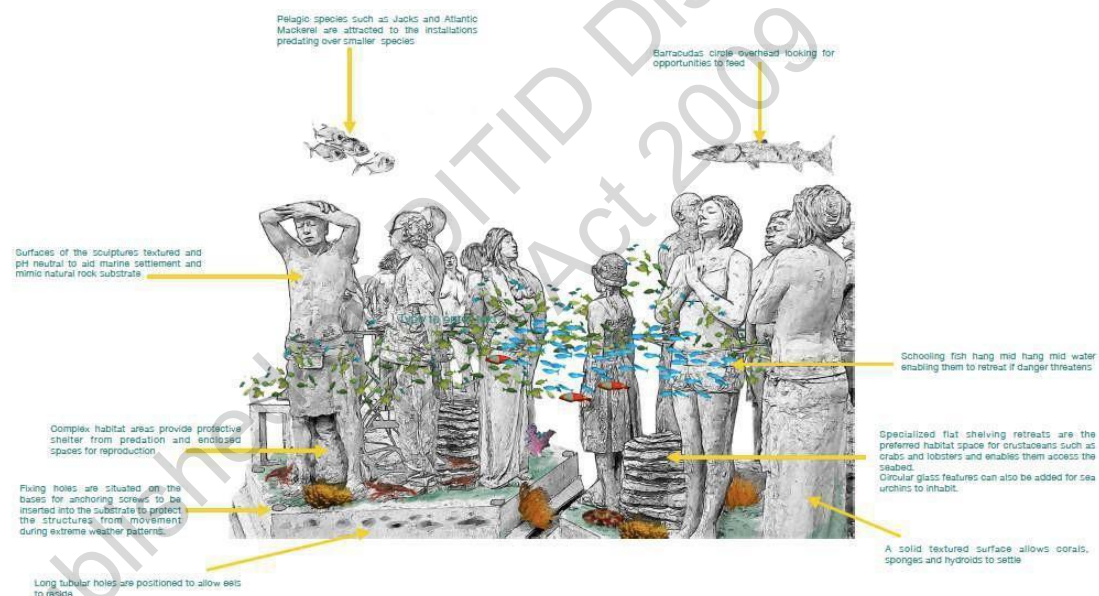


Figure 9. Examples of the design considerations used in Jason de Caires Taylor's work to maximise the habitat and biodiversity value of his underwater artworks

visitors. The potential safety issues associated with marine life (sharks, stingers) and weather (currents, visibility) must be considered and managed. The types of access are also important: pedestrian, boat-based viewing, snorkeling or SCUBA diving. A thorough risk assessment should be conducted for any design, considering issues such as risk of falling, entanglement, entrapment and injury from structural failure. Risks associated with vessel traffic and navigation should also be evaluated and minimised.

Destination reputation

One of the major benefits that underwater art installations can potentially bring to a region is enhanced profile and reputation as a tourism destination. However, this also presents risks if visitor experiences are not positive. With the rapid and extensive reach of social media, poor visitor experiences can quickly translate to negative impacts on tourism appeal, and therefore on visitor numbers. Taking great care to ensure positive tourism experiences should be a high priority for the design, promotion and management of any underwater art facility that aims to bring economic benefit to a region. Key considerations for ensuring an art installation delivers long-term tourism benefits, rather than risks, include: artistic merit, scale, uniqueness, salience and accessibility. Important complements to these are considerations of the cost and quality of access services provided by tourism companies. Competition between attractions can also harm tourism, as can inconsistent quality among similar tourism offerings. Where it is likely that a region will be promoting multiple underwater art experiences, strong coordination and quality control are important to ensure net benefits to all sites.

When art installations fail

The plan was to sink approximately 30 tonnes of concrete sculptures, fixed to the deck of a rusted 150-foot barge, in the Atlantic Ocean a half-mile east of the Deerfield Beach International Fishing Pier as an artificial reef that would attract marine life. Instead of dropping straight down into the Atlantic Ocean the rusty barge rolled over on its port side after the scuttle holes were opened and ended up coming to rest on top of Rapa Nui Reef. (Clary, 2015)

Crochet artist Agata Oleksiak illegally installed crochet wrappings around bomb-shaped sculptures at Cancun’s Underwater Museum, located in the Caribbean Sea. Museum director Jaime Gonzalez expressed dissatisfaction that Olek never attempted to gain permission for her installation, and told Fox News, “Believe it or not, there is a lot of marine life growing, encrusted on the sculpture, and we gather that this has killed it,” he said. The museum is part of an environmentally protected area, and Gonzalez stated that prosecutors are preparing to lodge charges against the artist. (Munro 2014)

Summary of risks and opportunities based on international examples

The published literature and social media provide a window into the risks and opportunities that have been identified through international examples of underwater art and underwater snorkel trails. We have compiled a SWOT analysis to summarise the risks and opportunities (Table 2). We have provided summaries from over 1500 Trip Adviser reviews of underwater sculptures at Grenada and Mexico and the majority are “Excellent” and only 1% is “Terrible” (Figure 10).

Table 2 Strength, Weakness, Opportunity, Threat (SWOT) for underwater art internationally (modified from Jason deCaires Taylor media overview and analysis of Trip Advisor comments).

STRENGTH	WEAKNESS
- Increased local tourism	- Poor visibility
- High tourism satisfaction	- Too deep for snorkelling
- Public art	- Too many people
- Over 1000 million people reached	
- Revenue from entrance	

fees - Revenue from merchandise	
OPPORTUNITY - Investment in the community - Protect natural reefs - Habitat for species to attach and aggregate	THREAT - Environment damage from poor design or installation



Figure 10. Trip Advisor reviews of Underwater sculptures at Grenada (left) and Mexico (right).

3. Assessment of opportunities and threats for snorkel trails and underwater art installations in Queensland

Context

There are several snorkel trails (Table 1) and underwater art projects (Appendix 1) in Queensland. This section is primarily focused on the opportunities and threats of underwater art projects.

Underwater art in Queensland

There are two underwater art projects in Queensland that have been installed. The first was a temporary installation at Moore Reef, Cairns in 2013 of several paintings and an inflatable turtle (Figure 11, Appendix 1). The second is an underwater sculpture of a popular 'Riot game' at Curtin Artificial Reef in 2016 (Figure 11, Appendix 1).

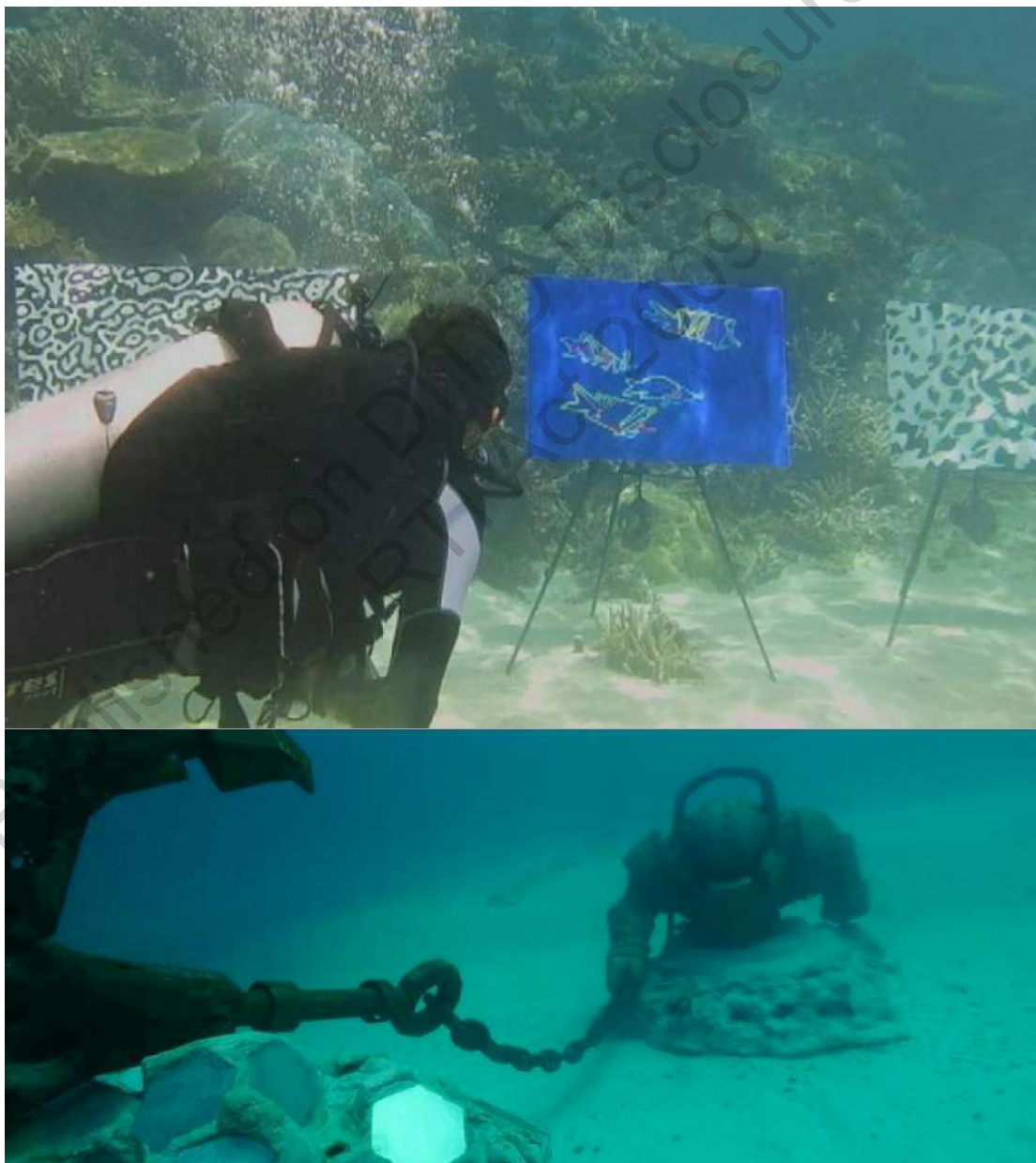


Figure 11. Underwater paintings temporarily installed at Moore Reef, Cairns, and underwater sculpture installed at Curtin Artificial Reef, Queensland.

There is growing interest in underwater art projects in Queensland as demonstrated in Appendix 1. Based on available information, we have prepared a summary of approved and proposed underwater art and related projects in Queensland, including information on location, date, proponent, concept and stage of development (Appendix 1). This information has been compiled from desktop research, meetings and consultation with GBRMPA, JCU, AIMS, QPWS, PMG, TCC, Perc Tucker Gallery, Adrenalin Dive, Citizens of the GBR, Townsville LMAC, Gold Coast Waterways, local artists, local tourism businesses, scientists, finance and local indigenous groups. The review and consultation has been statewide, with additional focus on Townsville where a major underwater art project is most advanced. Based on these consultations, we have prepared a SWOT (Strength, Weakness, Opportunity, Threat) analysis for underwater art as a regional development initiative in the Queensland region (Table 3). A key conclusion from the SWOT analysis is that there are numerous concepts and nascent project ideas, but limited substantive progress. There are a large range of opportunities for underwater art in Queensland including public art, education, tourism, science, sustainable behaviour, jobs and global media (Table 3). There are a lower number of threats and these are summarised as legislative requirements and funding (Table 3).

Table 3 Strength, Weakness, Opportunity, Threat (SWOT) for underwater art in Queensland

<p>STRENGTH</p> <ul style="list-style-type: none"> - Numerous ideas and plans - Art has been permitted in GBRMP - Art has been permitted in Qld waters - World class artist available - Queensland’s natural attributes 	<p>WEAKNESS</p> <ul style="list-style-type: none"> - No major underwater art installation - Ownership and maintenance? - Longevity?
<p>OPPORTUNITY</p> <ul style="list-style-type: none"> - Public art - Education (edu-tourism) - Increase tourism numbers - Increase visitor satisfaction - Increase pride and satisfaction of locals - Increase knowledge about reef - Increase knowledge about science - Increase knowledge about indigenous - More sustainable behaviour - Public- Private Partnership - Jobs (Direct and Indirect) - Global media - Underwater art/learning trail along Qld coast 	<p>THREAT</p> <ul style="list-style-type: none"> - Legislative complexity and time - Fundraising several million\$ - Competition for other sites - Natural threats (to structures e.g. weather, and tourists e.g. Irukandji jellyfish)

Conceptual model for planning and managing underwater art

We developed a conceptual model of the stages for underwater art projects (Figure 12) and used this model to evaluate the process and status of approved and ongoing underwater art ideas and projects in Queensland (Table 4). The table indicates that only two projects (Cairns 2013, Moreton Bay 2016) have been completed and most projects have only reached the Scoping stage.



Figure 12. Conceptual model for planning and management of underwater art projects.

Table 4. Summary of status of underwater art projects throughout Queensland (shaded projects have been installed), KEY ?- unknown, ✓ yes – no).

Location	Scoping	Consultation	Resources	Assessment	Construct & Install	Management
Cairns 2013	?	?	✓	✓	✓	?
Whitsundays 2013	✓	-	-	-	-	-
Bowen 2016	✓	-	-	-	-	-
Bundaberg 2016	✓	-	-	-	-	-
Moreton Bay 2016	✓	✓	✓	✓	✓	?
Townsville 2017	✓	✓	✓	Nov 2017	Jan 2018 - Dec 2019	-
Gold Coast 2017	✓	-	-	-	-	-

In order to further explore the issues that can help or hinder the development of underwater art projects in Queensland we have undertaken a PESTEL analysis (Table 5) which summaries Political, Economic, Social, Technological, Environmental and Legal issues. A positive assessment has been recorded where there is published information to demonstrate support. A negative assessment has been recorded where there is published information of an issue. In most cases the Political and Technological factors are unknown, the Social and Environmental factors are positive and the Economic and Legal factors are negative. The main issues that seem to be limiting project development are economic (project not adequately funded), and legal (difficulties obtaining permits and approvals). Through a review of the issues associated with proposed projects at seven Queensland locations, we have provided indicative assessments of the risks and opportunities associated with each. In all cases the overall risk was assessed as low. In contrast, the opportunity for successful project implementation varied widely between sites due to varying conditions associated with each site and project concept. Cairns and Bowen appear to face the greatest challenges, while the Gold Coast and Townsville have the highest potential for successful implementation of an underwater art installation project (Table 5).

Table 5. PESTEL analysis on underwater art projects and ideas throughout Queensland (Key +- positive, - Negative, 0- neutral, ? – unknown, VL- Very Low, L – Low, M – Medium, H - High).

Location	Political	Economic	Social	Technological	Environmenta	Legal	Risk	Opportunity
Cairns 2013	?	?	+	?	0	+	L	VL
Whitsundays 2013	+	-	+	?	+	-	L	M
Bowen 2016	?	-	+	?	?	-	L	L
Bundaberg 2016	?	-	+	?	+	-	L	M
Moreton Bay 2016	?	+	+	?	?	+	L	L
Townsville 2017	+	+	+	?	+	-	L	H
Gold Coast 2017	+	-	+	?	+	-	L	H

Potential economic benefits of underwater art – Townsville case study

Economic benefits are an important consideration in the design and justification of any project. For underwater art installations, there are relatively simple but robust approaches to modeling potential economic benefits under different scenarios. We have drawn on preliminary analysis from the Townsville Museum of Underwater Art project to provide indications of the scale of the economic contribution that can be expected from a project of this scale and significance. The preliminary modeling for MoUA Townsville (undertaken by Townsville Enterprise (TEL) and Sealink Queensland) indicates that a project funded with a \$2-3 million investment would attract 50,000 tourists per annum and yield approximately \$40 million per annum and create 300 jobs. A conservative estimate of 25,000 tourists yields \$20 million and a more optimistic estimate of 75,000 tourists yields \$60 million (Table 6). An Economic Impact Study for MoUA was produced by Empower Economics (2017).

Table 6. Extract of economic modeling of tourism at underwater art, Townsville.

Visitor Numbers		5000	10,000	25,000	50,000	75,000
Accommodation	40%	\$ 1,600,000	\$3,200,000	\$8,000,000	\$16,000,000	\$ 24,000,000
Transport/Fuel/Coach/Ferry	22%	\$880,000	\$1,760,000	\$4,400,000	\$8,800,000	\$13,200,000
Restaurant/Catering	20%	\$800,000	\$1,600,000	\$4,000,000	\$8,000,000	\$12,000,000
Other	18%	\$720,000	\$1,440,000	\$3,600,000	\$7,200,000	\$10,800,000
Total*		\$4,000,000	\$8,000,000	\$20,000,000	\$40,000,000	\$60,000,000

*This preliminary model of regional visitation is based on \$800 spent per tourist over a 3 -night stay. The model provides estimates for scenarios of additional tourists per annum to Townsville ranging from 5,000 to 75,000.

4. Demonstration projects: learning from local experiences with establishing a snorkel trail and underwater art museum

Context

The Destination Tourism Strategy highlighted that the North Queensland region is uniquely placed to be a Centre for Excellence for education, nature based and cultural tourism. One of the ‘Hero Experiences’ for Townsville is ‘Great Barrier Reef Centre of Excellence’ (Tourism Events Queensland 2017). This hero experience is based on the strength of world-class science and management at James Cook University, Great Barrier Reef Marine Park Authority, Reef HQ, Australian Institute of Marine Science and attraction such as the *Yongala* shipwreck and related reef, science, tourism and education products and attractions. There are great opportunities to improve existing products and attractions and to link these with new products and attractions. This section describes learnings from a demonstration project designing a snorkel trail sign at Magnetic Island and learning from the Museum of Underwater Art (MoUA) project.

Existing signage on Magnetic Island

There are two self-guided snorkel trails on Magnetic Island a popular day-trip for locals and tourists 25 minutes by ferry from Townsville. White surface and subsurface floats mark out the trails. Nelly Bay is the easiest for beginners, starting 100 metres off the beach. Information cards guide the snorkeler through gardens of lettuce, cauliflower, boulder and staghorn corals with colourful reef fish and a few giant clams. The Geoffrey Bay snorkel trail offers the added thrill of viewing the remains of a shipwreck, the *SS Moltke* and part of a World War II fighter plane.



Figure 13 Signage for snorkel trails and Nelly Bay and Geoffrey Bay, Magnetic Island.

The snorkel trails have signs (Figure 13) and swim cards for guidance (Figure 14). There is a location sign and swim card collection box at the road near the Nelly Bay snorkel trail. The sign at Geoffrey Bay Snorkel trail is on the main road and approximately 200 metres from the main snorkel entry area and therefore difficult for snorkelers to find and read. Trip Advisor rates only one (Geoffrey Bay) of the two snorkel trails on Magnetic Island. Most ratings are “Excellent” and the lowest rating is “Average”.



Figure 14. Snorkel trail swim card, Magnetic Island.

Pilot project: Expanding the snorkel trail opportunities on Magnetic Island

The large distance between the existing sign and the dive site and the simple information on the sign at Geoffrey Bay had significant potential for improvement. We believe that the biggest issue and opportunity for improving the snorkel trails at Magnetic Island is to have a sign that people can see at Geoffrey Bay and for them to learn about the reef, species, best environmental practices and to be able to interact with the sign and share the experience.

We undertook extensive consultation on the sign design and information with scientists, students, tourism operators, TEL, GBRMPA, QPWS, TCC, GBR Foundation and DTESB. Essential information included a map, best practices, marine species and what you can do to help the reef. We aimed to design a sign that is unique and attractive to tourists and we considered audio, electronic and interactive signage. We found one example of an interactive SCUBA sign (Figure 15) that is a good model for interaction with visitors and tourists.



Figure 15. Example of interactive underwater sign at Gladstone ferry terminal.

Our draft sign has maps of the snorkel trail, information on how people can help the reef, knowledge about the reef and species, best practices, social media and the sign is Interactive with two holes where people can put their faces and take a photo (Figure 16).

We sought quotes for sign production of 2400 x 1200mm (a QPWS Standard size) and the cost was between \$3000 and \$5000. Several locations at Geoffrey Bay (the site of the most popular snorkel trail) have been discussed with the leaseholder, Fantasea. Subject to agreement between the leaseholder and DTESB, the preferred location for installation will be at the barge ramp so that visitors and snorkelers can see, read and interact with the sign before they enter the water and when they exit the water they can review the species they have observed.

FRONT

How you can help the Great Barrier Reef

The Great Barrier Reef is an extremely important region for people, animals and plants. It has strong connections for Indigenous people, supports a multi-billion dollar tourism industry, provides sustainable fishing activities and is home to hundreds of species of fish and corals. The Great Barrier Reef is under threat by climate change, poor water quality, overfishing and coastal development. We can all help look after the Reef for current and future generations



BACK



Figure 16. Interactive underwater sign (double sided) proposed for snorkel trail at Geoffrey Bay, Magnetic Island.

Regional underwater learning trail

In order to improve the learning opportunities associated with the individual snorkel trails at Nelly Bay and Geoffrey Bay to a regional, integrated learning trail it is recommended that there is collaboration between existing reef and education organisations such as Reef HQ, GBRMPA, QPWS, AIMS, JCU, Sealink Queensland, Reef Check, GBR Foundation, Reef Guardian Schools, Townsville Local Marine Advisory Committee, Traditional Owners, Adrenalin Dive, Reef Ecologic, Aqua Scene, dive and fishing clubs and others who care about the reef and participate in education, science and management. The proposed MoUA project is a good example of a project where collaborations and linkages between stakeholders and the existing snorkel trail are being discussed. We have prepared a concept map of some of the potential linkages between existing educational facilities, research station, snorkel trails, dive sites, shipwreck, proposed signage and proposed underwater museum (Figure 17).



Figure 17. Conceptual map for a regional Great Barrier Reef underwater learning trail.

Queensland underwater and island learning trail

In order to encourage discussions about linkages between regional and potential Queensland underwater and island learning trails we have collated a list of key organisations.

Aquaria

- ReefHQ - Townsville
- Cairns Aquarium
- SEALIFE Sunshine Coast- Moolalabah
- Seaworld- Gold Coast

Research Stations

- Lizard Island
- Low Isles
- Orpheus Island (OIRS)
- Heron Island
- One Tree Island
- Moreton Bay Research Station

Significant locations for diving

- Port Douglas
- Cairns
- Townsville- Yongala
- Lady Elliot Island Eco-resort

Significant locations for specific education

- Bundaberg (Mon Repos Turtle)
- Fitzroy Island (turtle hospital)
- Hervey Bay (whale research)
- Whitsundays (islands)
- North Keppel Island Environment Education Centre

Mission Beach (Friends of Ninney Rise)
Cooktown Museum
Museum of Tropical Queensland
Deadly Science
Aboriginals and Torres Strait Islanders in Marine Science (ATSIMS)

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Regional pilot project: Museum of Underwater Art in Townsville

A major underwater art installation project has been under development in Townsville since March 2016. This project is large in scope and bold in vision, with a target budget of \$2-5 million and installations spanning four sites. The project is well advanced, with substantial funding committed from the private sector securing the services of the world's leading underwater artist, Jason deCaires Taylor for the project. The project has several unique advantages, including support from leading organisations. These include world-leading coral reef experts (Reef Ecologic, James Cook University, Australian Institute of Marine Science), one of Australia's largest marine tourism and transport companies (Sealink Travel Group), the world's premiere coral reef management agency (GBRMPA), the only Aboriginal and Torres Strait Islander community within the Great Barrier Reef Marine Park (Palm Island) and one of the most established regional art facilities in Australia (Perc Tucker Gallery - Townsville City Council). The project is widely considered to be regionally important, gaining substantial media coverage and public engagement (see Box).

Media coverage and information sites about the Museum of Underwater Art project
Project Prospectus and Website:
www.moua.com.au
Facebook:
<https://www.facebook.com/MuseumOfUnderwaterArt>
Media coverage:
[Underwater art museum to be a 'game changer' for reef tourism](#)
[Video: Preview of underwater art potential for Townsville](#)
[Underwater sculptor scouts Townsville reef](#)
[We need \\$2 million](#)
[Museum of underwater art could put Townsville on tourism map](#)
[A conversation with Townsville to steer the city in the right direction](#)
[The Mona effect](#)
[Burdekin calls to join underwater art discussions](#)

The project has been given priority status by Townsville Enterprise and the Townsville City Council, while also gaining enthusiastic endorsement from adjacent councils of Burdekin and Hinchinbrook. These ingredients have enabled the Museum of Underwater Art project to progress to an advanced planning phase, positioning it as a potential pilot project to inform and guide a Queensland strategy for underwater tourism developments. In this section we review the processes, outcomes and progress of the MoUA project as a foundation for subsequent sections, which propose guidelines for future projects and a framework for developing a Queensland strategy.

The timeline below summarises the key steps in the process, major outcomes and progress to date in developing the MoUA project.

Development timeline: Museum of Underwater Art

March 2016 Dr Adam Smith and Assoc Prof Paul Marshall from Reef Ecologic present concept for a temporary installation of underwater art in the Great Barrier Reef to Director Gallery Services, Townsville City Council.

April 2016 Concept consultation and project pathway is developed with stakeholders and regulatory agencies in Townsville, including GBRMPA, tourism industry, Townsville City Council and local community.

February 2017 Reef Ecologic develop an expanded concept for development of an Australian Museum of Underwater Art on the Great Barrier Reef (MoUA); Sealink (via General Manager Paul Victory) partners with Reef Ecologic to establish project leadership team; project steering committee is formed comprising representatives from Reef Ecologic, Sealink, Townsville Enterprise, James Cook University, Townsville City Council, Palm Island Council and Magnetic Island community.

April 2017 A public launch of the MoUA was made with TEL, Sealink and Reef Ecologic to media on the 21 April 2017. An initial fundraising of \$50,000 facilitated scoping and design phase of the project.

July 2017 Leading international underwater artist Jason deCaires Taylor is commissioned to conduct scoping, feasibility and design for the project, visiting Townsville for meetings and site visits 9-18 July 2017. Townsville Enterprise announced the MoUA project to the Townsville business community at the Townsville Bulletin Business Breakfast, with keynote address on the MoUA by Minister Assisting the Premier on North Queensland Coralee O'Rourke.

August 2017 Private sector funding of \$700,000 announced, plus significant in-kind support (including artist working gallery and project engagement space for 3 years) for the project.

October 2017 Project governance and operational structure formalised through establishment of not-for-profit organisation: MoUA Inc.

Sharing the story of Townsville's experience in developing the Museum of Underwater Art project

Recognising the value of the MoUA project as an opportunity to learn and inform future efforts to develop underwater tourism, education, conservation and art opportunities, the MoUA project committee, have produced a video (mini- documentary) to share their experiences. The video, produced in partnership with BlueKino productions (another partner and supporter of the MoUA project), was launched at the Townsville Bulletin Business Breakfast. It tells the story of MoUA as a pilot project, including considerations involved in minimising risks and enhancing opportunities. Several other videos have also been produced to share key stages in the project development process to date. Links to these videos are provided below.

Official video of the MoUA project and the scoping process:

<https://www.youtube.com/watch?v=stTSgItlnkiw>

Additional videos:

Introduction to the scoping visit

<https://www.youtube.com/watch?v=wVs1u8p47Y0>

Scoping visit to John Brewer Reef

<https://vimeo.com/225729563>

Media announcement of private sector investment

https://www.facebook.com/pg/ReefEcologic/videos/?ref=page_internal

In July 2017, the MoUA committee and Jason deCaires Taylor scoped 4 locations and 7 potential sites for underwater art (Figure 18). The themes for the MoUA included reef, science, Indigenous and environment (Figure 19, deCaires Taylor 2017). For each of the 7 locations, the artist prepared a site evaluation that considered environmental, social and cultural factors and provided a summary of advantages and disadvantages (Figure 20, deCaires Taylor 2017). A total of 36 intertidal and sub-tidal art concepts were presented by deCaires Taylor (2017) and 3 examples are provided in Figure 21.



Figure 18. Map of four proposed locations and seven site options for underwater art.



Figure 19. Themes for MoUA (from deCaires Taylor 2017)

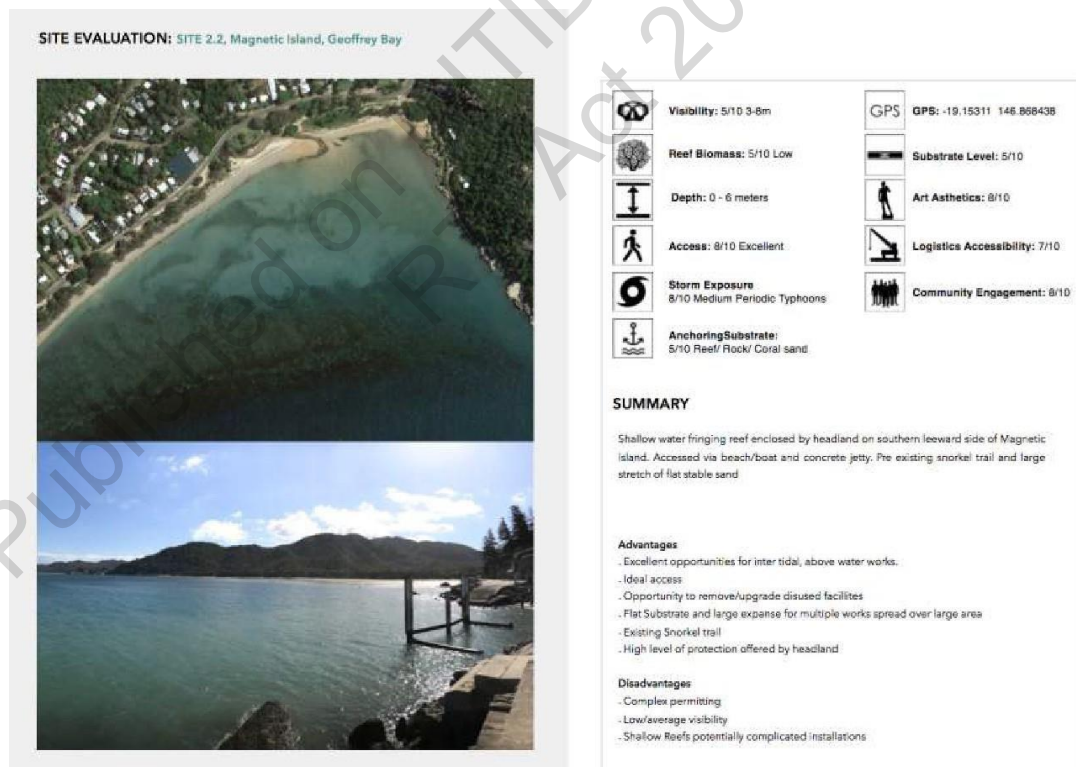


Figure 20. Format of site evaluation for MoUA (from deCaires Taylor 2017).



Figure 21. Selected underwater art concepts for MoUA (from deCaires Taylor 2017). NOT TO BE COPIED.

5. Opportunities for underwater art projects based on experiences from the MoUA pilot project

The following opportunities have been identified for development of underwater art installation projects:

- Artistic merit and scale of works is essential. To ensure exceptional visitor experiences and maximise tourism appeal, the works need to have genuine artistic merit, and be large enough to provide impressive experiences for visitors and spectacular media coverage opportunities.
- Accessibility is a key consideration. Underwater art installations need to be accessible to the largest range of visitors, while also providing opportunities for unique experiential engagement. This combination of qualities can be achieved through a multi-site approach in which some sites feature works that are visible both above and below water (and therefore visible by pedestrians or from a boat) while others feature subtidal works oriented more to underwater experiences by snorkelers and SCUBA divers.
- Local support is essential. Private investment and ongoing support from local businesses and community members is essential for the sustainability of an underwater art project. Local individuals and businesses should be involved in all stages of the project to ensure strong buy-in, local pride, and long-term support for the project.
- Partnerships make the project possible. A successful project will depend on a wide range of skills, interests and motivations. Partnerships between organisations and sectors will enable the necessary individuals and institutions to work together, share the workload and pool investments, while also maximising the reach of the project into the local community.
- A leadership team is key to maintaining momentum. A small leadership team comprising individuals with strong commitment to the project and mutual interests (if differing motivations) in the project's success is essential to harnessing the resources of the larger project team and maintaining progress on the project throughout the entire process.
- Environmental context is important to ensure salience. Underwater art will have the greatest impact on visitor experiences and attitudes if they are part of the wider environmental narrative that highlights connections between art, science, culture and the Great Barrier Reef.

- Works must meet regulatory requirements. Underwater art works are subject to strict environmental assessment and approvals processes. Understanding these and integrating them into the design process will help ensure the art works meet all relevant environmental and safety requirements and more readily progress through approvals processes.
- Sites must have unique qualities. Underwater art installations are likely to become increasingly popular, raising the prospect of competition among underwater art sites. Underwater art installations that can claim a point of difference through unique characteristics are likely to be most able to sustain their attractiveness as a tourist destination. While artistic merit and scale (mentioned above) can be effective ways to differentiate a site, unique features such as Townsville’s links to the world’s leading coral reef science and management organisations provide a stronger point of difference.
- There must be consideration of local, regional, state, national and international linkages and uniqueness of the project.

Risk Assessment

Table 7 outlines a preliminary risk assessment of issues identified with the MoUA (these issues would be common across other underwater installations) Two of the issues: Environmental and Social impacts were assessed as low risk due to risk controls such as site selection and public support. The committee identified and discussed three Medium risks associated with Legislation, Financial and Human resources. These medium risks can be reduced to low with further action on risk controls associated with scoping, communication, several revenue sources and the artist is contracted.

Table 7. Issues, consequence and likelihood, risk and controls for MoUA.

Issue	Consequence x Likelihood	Risk	Risk control
Inability to complete project because of legislation	Mo x U	Med	Scoping, communication
Inability to complete project because of environmental impact	Mi x U	Low	Site selection
Inability to complete project because of social impact	I x U	Low	Public support
Inability to complete project because of financial costs	Mo x U	Med	Several revenue sources
Inability to complete project because of human resources	Mo x U	Med	Artist is contracted

Investment

Delivering a project that meets the conditions recommended above requires significant investment. For the Townsville project, a core strategy was to secure the services of the world’s leading underwater sculpture artist, and to commission him to produce works of global significance. Work of this quality and scale are major endeavours in terms of artistic design, volumes of materials, construction infrastructure, logistics and installation. An installation of significant size and quality can be expected to cost in the order of \$2-5 M or

more. Securing funding of this scale involves strong co-investment from both private and public sectors, and a priority objective for the Townsville MoUA has been to secure substantial financial and in-kind support from local businesses (totaling over \$700K) as leverage for government funding. Additionally, the MoUA steering committee has implemented a staged approach to the project to spread financial requirements (and approvals, etc.) over multiple years. Early and substantial commitment of government funding to this project would minimise risks associated with delayed implementation and loss of private sector support.

Permissions

There are a range of Commonwealth, state and local government legislation, policy and guidelines that may apply to underwater art (see BOX).

The *Sea Installations Act* regulates the placement, use and maintenance of seabed installations in Australian waters.

A sea installation refers to any man made structure that is in contact with the seabed and used for an environment-related activity (e.g. tourism, recreation). The Sea Dumping Act is relevant for artificial reefs such as sunken vessels (and dredge materials).

Projects rarely require approval under both the Sea Installations and the Sea Dumping Acts.

<i>Environmental legislation, policy, guidelines and costs</i>	
<i>Great Barrier Reef Marine Park Act 1975</i>	
<i>Facility</i>	\$2360
<i>Advertising</i>	\$8610
<i>Public Environment Report</i>	\$43,110
<i>Environmental Impact Statement</i>	\$116,440
<i>Sea Dumping Act 1981</i>	
<i>Fee</i>	\$10,000
<i>Sea Installations Act 1987 (amended 2014)</i>	
<i>Fee</i>	\$0
<i>Environmental Protection and Biodiversity Conservation Act 1999</i>	
<i>Fee</i>	\$0 to ?
<i>Marine Parks Act 2004 (State only)</i>	
<i>Local Government Act 2009</i>	
<i>Public Art Policy</i>	

A significant challenge is determining the relevant legislation and application fee and obtaining the necessary environmental approvals for the installations. The multiple sites involved in the MoUA project provide many positive attributes to the project, but they also increase the number of jurisdictions and regulations that must be navigated to obtain all the necessary permits and approvals. While an installation on The Strand will only require approvals from Townsville City Council, other sites will require permits from the Great Barrier Reef Marine Park Authority. The MoUA Steering committee has invested significant effort from the earliest stages of project development to understand the permit and approvals requirements, and to work with relevant authorities throughout the entire process. The project team has worked closely with the GBRMPA to maximise alignment between the project and the science and management agenda for the Great Barrier Reef. Government support for the project in the form of expedited assessment and approvals processes by government agencies would substantively assist the project to deliver the full range of benefits to the region. Typically the environmental and assessment process takes between 3 to 18 months.

Competition and coordination

There has been strong interest from several other jurisdictions in Queensland for underwater art projects and some of these proponents have contacted Jason deCaires Taylor. There are substantial risks from having multiple sites promoting underwater art installations as key tourism offerings, with the potential for harmful

competition within the region, and an overall dilution of destination appeal through market saturation and loss of uniqueness. These risks are further increased if sites vary in quality and therefore visitor experiences. Sites delivering sub-standard experiences are likely to damage the reputation of the entire region as a destination for underwater art experiences. There is also the potential for underwater art to build the reputation of Queensland (and indeed Australia) as a prime destination for tourists seeking a unique and memorable experience will be maximised through careful control and coordination of the quality, character, number and distribution of underwater art installations. A Queensland strategy for coordinated development of underwater tourism projects, focusing on underwater art installations, would provide a mechanism to minimise these risks, build investor confidence, and maximise benefits to the state.

The following section builds on these experiences and opportunities to outline a proposed strategy for Queensland.

6. Proposed strategy and guidelines for development of coastal and underwater tourism opportunities in Queensland

With the growth in interest in developing underwater tourism opportunities such as underwater art installations, there is an urgent need to develop a clear vision and strategy for Queensland. This will help Queensland to establish and maintain a reputation as a globally significant destination for visitors seeking memorable experiences in this new tourism segment, and to sustain the associated social and economic benefits. In the early stages of development of these opportunities, a compelling strategy will also help build investor confidence and public support necessary for project realisation.

Queensland strategy for underwater art and tourism developments

Based on our experiences with the MoUA pilot project, extensive consultations with international project sites (Grenada and Mexico), the world's leading underwater artist Jason deCaires Taylor and our counterparts in other regional centres in Queensland interested in developing underwater art projects, and a review of relevant literature, we provide the following as key elements for a Queensland strategy.

- I. ***Establish Queensland Underwater Art Guidelines.***
The long-term success of underwater art installations as a regionally significant contribution to the tourism economy will depend strongly on the quality and sustainability of the works as a tourism attraction. Guidelines for the design, installation, maintenance, monitoring and promotion of underwater art projects in Queensland will help ensure benefits are maximised and risks minimised. Preliminary suggestions for guidelines are provided below in Table 8.
- II. ***Develop a policy or clearing-house to facilitate permissions for approved projects.***
Major underwater art installation projects are likely to require consideration and approvals under a range of regulations. A dedicated policy or guidance specific to underwater art installations will clarify and expedite approvals processes while ensuring projects meet environmental and safety requirements.
- III. ***Establish an Advisory committee.***
Establish a Queensland Underwater Advisory Committee (similar in structure and function to the MoUA committee or Premiers Protocol committee) and led by DTESB to develop policy and guidelines on underwater art installations and related underwater tourism projects, such as snorkeling trails, artificial reefs, fish attractive devices, and reef restoration.
- IV. ***Limit the number of major sites.***
The number of sites featuring underwater art installations as a major tourism attraction in Queensland should be kept small to maintain quality and reputation of the region as a destination for memorable underwater art experiences. Sites should be selected that have and can maintain unique points of difference in the growing international underwater art tourism market, and where underwater art installations provide important tourism development opportunities that will be enduringly significant to the local economy.
- V. ***Present a coherent Queensland-wide tourism product.***
Queensland should be promoted in both national and international tourism markets as an underwater art experience destination. Tourism marketing should promote major sites in Queensland as part of a coherent experience, along the lines of an “underwater art museum trail”. Major sites in Queensland should be developed to be clearly differentiated (each offering unique visitor experiences), but linked thematically and in presentation to the market. This will maximise synergies through shared marketing and promotion, while minimising risks from competition or market dilution.

VI. Establish a dedicated project development fund.

Establish a fund for approved underwater tourism projects. This fund should be dedicated to projects that conform to the Strategy and Guidelines, and that meet other requirements as developed by the Committee. To be eligible, projects should have a proportion of total costs (50%) financed through private sector commitments.

Guidelines and principles for development of underwater art and tourism projects in Queensland

We have provided a project guidance checklist for development of significant underwater art projects in Queensland (Table 8) based on the proposed strategy (section 6), conceptual model (Figure 12) and a checklist for installation and operation of a facility developed by GBRMPA (GBRMPA 2017) (Table 9).

We believe that this checklist provides more detailed information for Planning, Assessment, Construction, Installation and Ongoing Management phases and provides examples of key documents and steps such as Map, Planning Committee, SWOT analysis, Project plan, Communication Plan, Website, media release, Budget, Fundraising, Company, Risk assessment, Baseline research, Permit application, Public advertising, Contracts, permit, Monitoring, Deed/Bond and Report. We note that some of these stages and documents may not be required depending on the scale, location and risks of the underwater art project.

Table 8 Guidance checklists for development of underwater art projects in Queensland, based on project stages and key documents and steps.

Project stages	Key documents or steps
<p>STRATEGIC ADVICE</p> <p>Planning committee</p> <p>Identify location and site options</p> <ul style="list-style-type: none"> • Does the site have good water visibility (5m plus) • Does the site have natural attractions • Are the sites safe (wave, current, tide) <p>Is the project consistent with Qld strategy¹</p> <p>Has the Qld Underwater Advisory Committee been consulted¹</p> <p>Does the project add value to Qld-wide art and tourism</p>	<p>Map of site(s)</p> <p>Planning committee</p> <p>Qld Strategy¹</p> <p>Qld Committee¹</p>
<p>SCOPING</p> <p>Identify primary purpose: art or artificial reef (if artificial reef go to GBRMPA 2011 or Australian Government 2017)</p> <p>Name and biography of artist.</p> <ul style="list-style-type: none"> • Is the art and artist high calibre <p>What are the potential issues and benefits</p> <p>Alignment to local natural environment, cultural and Indigenous heritage of the respective region</p>	<p>SWOT analysis</p> <p>Project Plan</p>

<p>What are the materials</p> <p>What is the timeline</p>	
<p>CONSULTATION</p> <p>Who are the stakeholders</p> <ul style="list-style-type: none"> • Is there TO, government, science, industry collaboration • What are the community views • Are the community involved in site selection • Are the community involved in art selection • Are there any major concerns or conflicts 	<p>Communication Plan</p> <p>Website</p> <p>Media release</p>
<p>RESOURCES</p> <p>Is there an organisation or individual leading the project</p> <p>Who is on the project team and what are their skills</p> <p>Is there financial and in-kind support (Budget for 1-10 years)</p> <p>Is there a legal framework and Governance structure.</p>	<p>Budget</p> <p>Fundraising\Grant</p> <p>Company or entity</p>
<p>ASSESSMENT</p> <p>What is the regulatory and jurisdictional context and timing</p> <p>Is the project in the GBRMP (go to Table 9). Is an EIS required? Is an EMP required?</p> <p>What are the quantitative risks and benefits (risk assessment)</p> <p>Has a social study \ public consultation been completed.</p>	<p>Risk assessment</p> <p>Baseline research</p> <p>Permit application(s)</p> <p>Public advertising</p>
<p>CONSTRUCTION AND INSTALLATION</p> <p>Has an artist been contracted</p> <p>Is the construction material environmentally friendly</p> <p>Has a marine engineer been contracted</p> <p>Has a permit been approved</p>	<p>Contracts</p> <p>Permit</p> <p>EMP</p>
<p>ONGOING MANAGEMENT</p> <p>Has a research and monitoring project been initiated (permit)</p> <p>Have interpretation materials been prepared.</p> <p>Have tourism and business arrangements been contracted.</p> <p>Ongoing maintenance – responsibility?</p> <p>Decommissioning plan</p>	<p>Monitoring</p> <p>Contracts</p> <p>Deed\Bond</p> <p>Report</p>

¹. These are recommended processes for Queensland Government policy consideration

Table 9. Checklist for installation of a facility in the GBRMP (GBRMPA, 2017).

1. Name and description of the proposed facility.	<input type="checkbox"/> Submitted
2. Justification – Why do you need to use the Marine Park? What alternatives have been considered, and why have they been ruled out?	<input type="checkbox"/> Submitted
3. Purpose of proposed the facility's use – commercial or non-commercial.	<input type="checkbox"/> Submitted
4. Location of the proposed facility, including: a. ESRI files (preferred) or Differential GPS coordinates b. PDF map showing the proposed footprint of the facility, overlaid on a satellite image using the highest resolution imagery possible.	<input type="checkbox"/> Submitted
5. Design drawings, which may be: a. For new facilities – i. Schematic drawings, with engineer, naval architect or marine surveyor certification (as relevant for the type of facility) confirming that the facility can be designed and installed to meet GBRMPA requirements and relevant Australian standards for that type of facility; or ii. Engineer, naval architect or marine surveyor certified design drawings (as relevant for the type of facility) that meet GBRMPA requirements and relevant Australian standards for that type of facility; or b. For existing but unpermitted facilities – i. Final record drawings (as-built) certified by an engineer, naval architect or marine surveyor (as relevant for the type of facility) that accurately reflect the as-built facility and that the facility has been installed in accordance with GBRMPA requirements and relevant Australian standards for that type of facility. c. If applying for a 20 year permit: i. Details about the nominated design life of the facility once installed, including any refurbishment that will be likely during the life of the permit. This should be provided in consultation with an engineer, naval architect or marine surveyor as relevant for the type of facility ii. Decommissioning and removal plan	<input type="checkbox"/> Submitted
6. Consideration of whether the proposal is likely to impact Matters of National Environmental Significance protected under the <i>EPBC Act 1999</i> . See the Australian Government's Significant Impact Guidelines 1.1 - Matters of National Environmental Significance for more information.	<input type="checkbox"/> Submitted
7. If required, a draft Environmental Management Plan, including: a. Description of physical site characteristics including water depths, type of substrate, physical conditions (wave, wind, currents) b. Evaluation of the biodiversity values of the site and location, including habitat types, species present and how these species use the site (feeding, reproduction, rest, transit) c. Evaluation of social values of the location, including site characteristics such as other facilities and uses (both recreational and commercial) within 1km of the proposed location d. Evaluation of the historic heritage values of the site and location e. Evaluation of Traditional Owner heritage values associated with the site and location	<input type="checkbox"/> Submitted <input type="checkbox"/> Not applicable
f. Construction and installation schedule - proposed timeframes of the project, including relevant seasonal considerations g. Description of the methods to be used in transporting materials, installing the facility, controlling debris, and disposing of wastes h. Description of the activities proposed to take place on or around the facility once operational, including any ancillary equipment or vessels that will be stored at the facility i. Inspection and maintenance schedule including description of how (logistically) the facility will be serviced j. The values of the Marine Park potentially affected, the risks posed to the values and how the risks will be avoided, mitigated or offset to achieve no net loss of the Marine Park values k. Details of any proposed monitoring programs (including background monitoring, operational monitoring and long-term monitoring). <i>Note: the Assessment Guidelines provide information on the types of facilities that may require an EMP.</i>	
8. A decommissioning and removal plan.	<input type="checkbox"/> Submitted
9. Salvage quotes.	<input type="checkbox"/> Submitted

Developing a set of principles and guidelines for current and future projects is an important task for assisting decision making on proposed underwater tourism projects in Queensland. We describe existing state and local public art principles and proposed additional principles for public art.

PRINCIPLES FROM ART FOR ALL QUEENSLANDERS STRATEGY 2014-2018 (Queensland Government 2014)

- Local is where culture counts — local networks and connectors, local skills development, local opportunities and local products are key to place-making, pride-building, local economy and cultural tourism engagement. Strengthening local communities means strengthening regions.
- Participatory culture has landed—like sport, arts has the potential to enable many people to have a stake in the making, presenting, supporting and discussion of culture. People’s active participation in arts and culture and their own creative, artistic and cultural expression are central to strong arts communities.
- Quality matters — along with excellence, beauty and inspiration, people want relevance and value. Quality arts and culture has a connection — a dialogue with its communities. Quality arts businesses and projects continuously learn and improve. Arts and culture that receives public investment must return public value (artistic, cultural, social or economic) to its communities of interest and practice.
- Embracing diversity gives us an edge — diverse cultures, ethnicities, heritage, age groups, abilities, forms, locales and scales of arts practice give us a competitive edge culturally and economically. Connecting with and within this plurality will strengthen our cultural offers.

PROPOSED PRINCIPLES FOR QUEENSLAND UNDERWATER TOURISM PROJECTS

- Alignment with local authorities strategic plan, economic development policies and art policies;
- Projects should be designed to build on lessons from previous underwater art projects;
- Project should be a partnership between government, industry, science and the community;
- Traditional owners should be consulted and invited to be involved in project planning, operation and ongoing jobs;
- Baseline scientific information on marine habitats, species, water visibility and human uses is essential;
- The project should generate a net benefit for the environment and communities; There must be environmental, social and economic monitoring programs in place to demonstrate the benefit and costs; and
- Project should provide opportunities for tourists, locals and students to engage in action-based learning.

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8. Appendix 1. A review of underwater and relevant marine art proposals and projects in Queensland (grey shading indicates installed).

Location	Sites	Proponent	Concept	Stage	Risk and Opportunity	Reference
Cairns	Moore Reef		6 paintings and inflatable turtle	Installed (temporary) 2013 Artist BJ Price	Very low risk, very low opportunity	http://www.abc.net.au/news/2013-12-10/underwater-art-exhibition-goes-on-display-on-barrier-reef/5146678
Cairns	Esplanade (land)	Citizens of the Great Barrier Reef	Stingray	Installed 2017 artist Brian Robinson	Very low risk, Medium opportunity	http://www.cairnspost.com.au/news/cairns/great-barrier-reef-sculpture-on-track-to-be-unveiled-in-late-august/news-story/4283c22806c8f7fb75c3004b016cab83
Townsville	Magnetic Island (land) ¹	Queensland Government	Sculpture- <i>Eye to the Sky</i>	2009, Graham Chalcraft	Very low risk, Low opportunity	http://www.magnetics.com.au/article-3599.html
Townsville	4. Strand, Magnetic Island, Palm Island, John Brewer Reef	Museum of Underwater Art, Australia	Reef Education, Science, Stewardship and Indigenous	Scoping and Fundraising, artist Jason deCaires Taylor	Low risk, High opportunity	http://www.moua.com.au
Whitsundays	Daydream Island (land)	Daydream island resort	3 mermaids	Installed and 2 lost in Cyclone Debbie	Low risk, Low opportunity	https://www.whitsundaytimes.com.au/news/iconic-daydream-island-mermaids-washed-sea/3160262/
Whitsundays				Scoping 2012	Medium risk, Medium Opportunity	

Bowen				Scoping, 2016 Application	Low risk, Low opportunity	
Bundaberg	The Basin, Turtle Rock Pool, Burkitt's Reef, Cocharane Artificial, 17Nm east Hervey Bay Reef,	Krista Hauritz	Tree trunk Stewardship, Nest, Marine forest	Scoping, 2016 Feasibility Study. Artist Jason deCaires Taylor	Low risk, Medium opportunity	Not available online
Gold coast			Nude sculptures	Scoping, 2015 artist Frederic Berjot	Medium risk, Medium opportunity	https://www.facebook.com/underwatersculpturepark/ http://www.abc.net.au/local/photos/2015/09/16/4313473.htm
Gold Coast	Gold Coast seaway, Wavebreak Island	Gold Coast Waterways Authority	Sculpture museum (aboriginal township or rum ship)	Scoping, 2017 Vision and feasibility. Local artist preferred.	Low risk, High opportunity	On hold- need \$1 million funding
Moreton Bay	North Stradbroke Island	QPWS	Artificial reef (marine life)	Scoping	Low risk, Medium opportunity	https://www.npsr.qld.gov.au/parks/moretonbay/zoning/trial_artificial_reef_program.html
Moreton Bay	Curtin Artificial reef		Riot Games Nautilus Statue	2016		http://oce.leagueoflegends.com/en/news/community/community-events/nautilus-reef-january-2016-update

¹. This sculpture is on reclaimed land that is technically part of the Great Barrier Reef Marine Park so it involved public consultation and GBRMPA permit