Gladstone
Healthy Harbour
Partnership

Healthy Harbour, Healthy Future

STEWARDSHIP
in the Gladstone Region

2021

Contents

THIS DOCUMENT is a collection of local Stewardship activities, demonstrating what has been achieved, over the past years, to contribute to the continuing good health of the Gladstone Harbour. The Harbour's health is assessed annually by an Independent Science Panel through the Gladstone Healthy Harbour Partnership's (GHHP) Report Card.

THE RICHNESS OF GLADSTONE HARBOUR AND ITS

Healthy Partnership

Besides being Queensland's largest multi-commodity port, Gladstone Harbour is rich in marine resources, from fish and coral to seagrass and tidal wetlands part of which creates a stunning natural beauty. The Gladstone Healthy Harbour Partnership (GHHP) was formed in 2013 to value and ensure the survival and restoration of the ecosystem. This Partnership between government, industry, research organisations and community groups independently monitors and reports on the continuing health of Gladstone Harbour. GHHP released its first annual Report Card in 2014.

The Report Card continues to monitor and report on the environmental, social, cultural and economic health of the harbour, through an annual set of scores and grades, across these four spheres. The data underpinning the scores in the Report Card is assessed by an Independent Science Panel before it is released. Through the GHHP's Report Card, community and industry alike can access the results of all this scientific expertise. GHHP is grateful for the input and support from its Partners in producing a robust Report Card that is trusted by the community.

GHHP has compiled this Stewardship Report in the hopes that you enjoy learning more about the works of our Partners and local community groups.

Professor Iain Gordon

GHHP Independent Chair

As a Partnership, GHHP incorporates government, industry, research groups and the community with the shared goals of:

1. Independently monitoring and reporting on the continuing health of the harbour - environmentally, socially, economically and culturally;
2. Identifying opportunities, based on rigorous science and strong stakeholder engagement, to assist in future decisions and improve where necessary;
3. Releasing an annual report card.

Building Capacity for Erosion & Sediment Control & Urban Stormwater Management

WHEN POOR QUALITY WATER FLOWS FROM THE LAND TO THE GREAT BARRIER REEF IT NEGATIVELY IMPACTS THE ENTIRE ECOSYSTEM.

The issues of erosion and sediment have a widespread effect. Erosion is the process of rock, soil and sediment being carried downstream by the power of a river. Increased erosion strips our land of valuable topsoil and fills our rivers and oceans with unwanted elements, decreasing water quality.

Sediment clouds the water and blocks sunlight from reaching the photosynthetic algae that gives coral its vibrant colours. The algae depends on the sun to survive. Sediment can also kill or damage seagrasses which need the sun to survive, and are important food for mammals and fish.

PROGRAM FOR GLADSTONE

To oversee, fund and manage this issue over the last four years, the Queensland Government's Department of Environment and Science (DES) Office of the Great Barrier Reef has established the Erosion and Sediment Control and Urban Stormwater Capacity Building Program. This program will assist with building capacity of council staff located within the Great Barrier Reef catchment, including those in Gladstone, to assess and manage erosion and sediment control in their urban environment, in order to reduce sediment loads entering waterways and the adjacent Great Barrier Reef and associated local waterways.

At present, the program is being led on the ground by Healthy Land and Water – Water by Design (HLW), who are recognised as leaders in erosion and sediment control and urban stormwater management. Some of the recent highlights of the Erosion and Sediment Control and Urban Stormwater Capacity Building Program for the Gladstone region include:

- A Gladstone Urban Stormwater Capacity Building workshop in June 2020, attended by 54 Gladstone Regional Council Officers to support the adoption of water sensitive development and stormwater management practices.
- A Gladstone Erosion and Sediment Control regulatory and compliance capacity building workshop in December 2020, to enable Gladstone Regional Council staff to undertake Erosion and Sediment Control enforcement actions on house construction and larger civil sites, land development and linear infrastructure.
- The 2020 Agnes Waters Co-Design Project, developing a proposal for an exemplar waterway activation project co-designed with the community.

The Gladstone Regional Council has adopted the Office of the Great Barrier Reef's policy that will assist in Erosion and Sediment Control and Urban Stormwater Capacity Building.

Urban Water Stewardship Framework

DEVELOPMENT & APPLICATION IN THE GLADSTONE REGION

The Office of the Great Barrier Reef led the development of the Urban Water Stewardship Framework (UWSF) - a system for benchmarking and reporting on the level of management practice being applied to aspects of urban water management linked to erosion control during construction, stormwater management and wastewater management.

The UWSF is a tool for classifying and assessing a council's urban water management activities against best practice and legislative standards. It covers urban water management activities primarily relevant to local governments.

This framework was developed over a three-year period with significant input from councils and industry, with a key objective of providing report card partnerships with a new management practice (stewardship) assessment metric for reporting against.

After approval for use by the Independent Science Panel, the Urban Water Stewardship Framework has been applied for the first time in the GHHP region.

THE ASSESSMENT PROCESS COLLECTIVELY ENGAGED SEVERAL SECTIONS WITHIN GLADSTONE REGIONAL COUNCIL, PROVIDING A FANTASTIC OPPORTUNITY FOR COLLABORATION AND KNOWLEDGE SHARING.

While the primary function of the framework is an assessment and reporting tool, real improvements in management practices and associated water quality outcomes can only occur if areas of opportunity for management practice improvement (as identified during the assessment process) are discussed amongst local urban water managers.

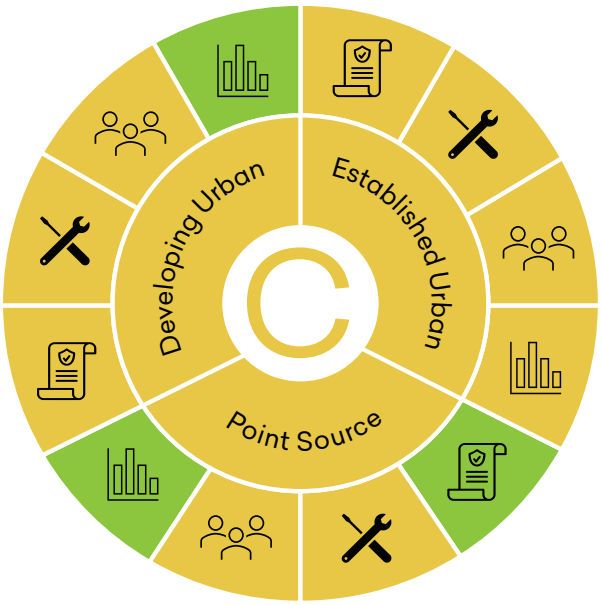
The Urban Water Stewardship Framework assessment and reporting will be done every two years, with a review and update done every five years.

Gladstone Regional Council

Urban Water Stewardship Assessment

Based on the Urban Water Stewardship Framework assessment process, Gladstone Regional Council's overall level of urban water management practice was rated a C.

Figure 1. Individual result highlights:



WHAT WAS ASSESSED?

Urban water management activities were assessed across three primary groups:

1. Activities that may contribute to diffuse pollution associated with **Developing Urban** areas.
2. Activities that may contribute to diffuse pollution associated with **Established Urban** areas.
3. Activities that may contribute to **Point Source** pollution (associated with sewage treatment and sewer network management).

Policy, planning & governance
Infrasturucture management & maintenance
Social approaches
Monitoring & reporting

Table 1. Score and criteria for assessing the Urban Water Stewardship:

Rating	Category	Score	Water Quality Risk Level
A	Above best practice performance	> 17.5	Very Low
B	Current best practice performance	12.5 - 17.4	Low
C	Current minimum standard	5.1 - 12.4	Moderate
D	Superseded or out of date standards	0 - 5.0	High

The overall rating for Urban Water Stewardship was a C, with all three framework components also receiving a C rating (Figure 1). This represents a level of practice that is in line with current minimum standards (i.e. meets regulatory requirements and / or is consistent with current industry standard practice) and equates to a moderate risk to water quality.

The results achieved in 2020-21 are generally consistent with the current level of urban water management practice being achieved for diffusing urban pollution across the central region of the Great Barrier Reef catchment. Point Source pollution management scored particularly well and received B's for the Policy, Planning and Governance and Monitoring and Reporting management activity groups. In addition, almost 90% of treated sewage goes to beneficial reuse, instead of being discharged to local waterways, thereby reducing the risk of impact from nutrient pollution.

Developing Urban was rated C overall, but received a B for the Monitoring, Evaluation, Reporting and Improvement activity group within this component. Established Urban was also rated a C, but this is expected to improve when the current stormwater management plan is reviewed and updated.

Gladstone Regional Council is contributing to the 2050 Water Quality Improvement Plan and (Paddock 2 River) strategies by working to implement improvements and strategies identified in the Urban Water Stewardship Assessment with a reassessment to be done in 2023.

Our Coast. Our Future.

What are the coastal hazards on the Gladstone Region's coastline and how do we plan to manage, and where possible, reduce these impacts on our coast and communities?

HOW WILL COASTAL HAZARDS INCREASE DUE TO CLIMATE CHANGE?

In addressing these issues, Gladstone Regional Council has developed a long-term strategic plan aptly named Our Coast. Our Future. - Coastal Hazard Adaptation Strategy (CHAS). Through this process, GRC asked people to share their knowledge on coastal values, threats and experiences to determine the objectives of the Strategy.

THIS INFORMATION WENT TOWARDS DEVELOPING THE FOLLOWING OBJECTIVES:

- Retain the natural beauty of the coast
- Minimise potential impacts on tourism
- Protect important ecosystems
- Protect freshwater and tidal waterways and wetland habitats that support our special and diverse wildlife such as turtles, dugongs and migratory shorebirds
- Maintain access to the region (including 4WD beach access)
- Protect significant, protected and sensitive areas (environment and biodiversity)
- Limit impact on assets and infrastructure (including new developments) within the hazard zone
- Limit adverse impacts on scenic amenities
- Maintain access to beaches and assets
- Retain sandy beaches

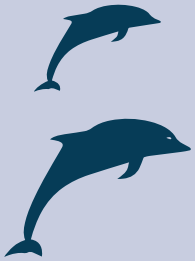
Images supplied by Gladstone Regional Council

Adapting to coastal hazards is a shared responsibility for all in the Gladstone region. GRC's objectives will be implemented progressively and Council will continue to seek opportunities to work together as this adaptation journey continues because it really is *Our Coast. Our Future.*

Facing Island Environmental Management

Facing Island is situated within the Great Barrier Reef World Heritage Area (GBRWHA) and includes many local attributes and environmental values that contribute to the Outstanding Universal Value of the GBRWHA. These include terrestrial and marine environmental values of national and state significance that are also recognised under Queensland and Australian legislation.

Facing Island also has important nearshore and coastal environments including intertidal and subtidal habitats such as tidal saltmarshes, mangroves, saltpans, mudflats, reef communities and seagrass meadows. These environments provide important habitats and / or food resources for a range of marine animals, including ***Environment Protection and Biodiversity Conservation Act 1999*** listed species such as dugongs, inshore dolphins, marine turtles and migratory shorebirds, as well as resident shorebirds, fish and crustaceans.



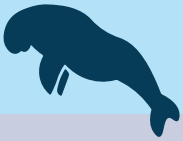
THE ISLAND HAS SIGNIFICANT INDIGENOUS AND EUROPEAN CULTURAL RELEVANCE AND IS USED FOR VARIOUS RECREATIONAL PURPOSES BY GLADSTONE AND DISTRICT RESIDENTS.

Gladstone Port Corporation (GPC) is trustee, regulator and manager of Strategic Port Land on Facing Island due to its position protecting the harbour. It is through this role that GPC is required to manage any potential impacts from development to the environmental, cultural and social values of the island. The Port of Gladstone has been identified as a Priority Port under the ***Sustainable Ports Development Act 2015***.

As trustee of Facing Island, GPC is active in a number of programs on the island. These include pest flora and fauna management, flora and fauna surveys, cultural heritage surveys, land management, marine debris collections and turtle and shorebird monitoring. GPC also regularly engages with the Facing Island community through forums and email communications.

This is an ongoing commitment for GPC, as trustee of Facing Island, which has had the following outcomes:

- Potential impacts (direct, indirect and cumulative) are managed effectively.
- Environmental, cultural and social values are maintained on Facing Island.
- GPC's knowledge of the environmental, cultural and social values on Facing Island is enhanced.
- The Facing Island community is engaged.



Gladstone Ports Corporation

East Shores Project STAGE 1B

With the first sod being turned in June 2019 and completed in August 2020, GPC expanded their award-winning recreational waterfront precinct, East Shores, to continue to provide the community with greater access to the waterfront through the provision of parklands and community infrastructure.

STAGE 1B BROUGHT A RANGE OF NEW FACILITIES TO THE EAST SHORES PRECINCT INCLUDING:

- Restaurant and microbrewery
- Cruise ship passenger terminal
- Additional barbeque facilities
- Basketball hoops
- Big-screen outdoor theatre
- Fishing platform
- Boot camp area

Gladstone's rich maritime and industrial history is celebrated throughout the parklands with various displays including an original 1947 D6 Dozer, the South Trees Lead Light, the calcite conveyor and hopper system, anchors and other maritime artefacts.

The displays pay homage to the site's history as part of Auckland Point Terminal, which handled more than 56,000 tonnes of calcite per year. This once industrial space has been provided for the community as an area to meet, exercise, relax and play.

Images supplied by Gladstone Ports Corporation

GPC, with their East Shores Stage 1B, is continuing to provide Gladstone locals and visitors with new recreational spaces and community facilities to improve health and wellbeing.

Turtles - LONGEVITY & LNG'S

The city of Gladstone provides one of the few settings where Queensland's unique marine and island environments coexist alongside a diverse range of heavy industries. Port Curtis is central to the export of numerous commodities, including liquefied natural gas (LNG), coal, alumina, grain and cement, while also providing a home to several sea turtle species.

GREEN TURTLES ARE GLADSTONE'S MOST ABUNDANT SPECIES OF TURTLE, AND LIVE WITHIN THE SHELTERED WATERS OF THE PORT, GRAZING ON SEAGRASS, ALGAE AND MANGROVE FRUITS.

Smaller numbers of flatback turtles visit the region's beaches each summer, nesting on Curtis Island and Facing Island before returning to their foraging grounds, which are dispersed throughout the Great Barrier Reef lagoon between Bundaberg and Cape York.

There are three LNG facilities on Curtis Island operated by Shell's QGC business, Santos GLNG and Australia Pacific LNG operated by ConocoPhillips. The LNG operators are funding the study of the ecology and health of Gladstone's marine turtles. The monitoring program, which has been underway for several years, collects information about many of the life stages of marine turtles which can assist in future management of the species.

The research initiative is documented in the LNG Proponents' Long Term Turtle Management Plan. Shell's QGC business, Santos GLNG and ConocoPhillips worked together to establish the joint plan and implement it in partnership with stakeholders, including Eco Logical Australia, the Department of Environment and Science and the Gladstone Ports Corporation.

The monitoring program collects information about many of the life stages of marine turtles, including eggs, hatchlings, sub-adults and adults. Hundreds of flatback turtles start their lives each summer when they emerge from nests on the beaches of Curtis Island and Facing Island and make a night time scurry for the sea. Researchers examine the tracks left in the sand to determine the proportion of hatchlings that reach the ocean and the orientation of their tracks.

Hatchlings can be attracted to artificial sources of light, such as sky glow from Gladstone's many developments, which may confuse them and disorient their journey to the sea. Every two years, sky glow is measured using specialised equipment. To date, there has been minimal evidence of disorientation, with the majority of hatchling tracks aligned towards reaching the sea.

SEVERAL YEARS OF SATELLITE TRACKING HAVE BEEN COMPLETED AT MULTIPLE LOCATIONS IN THE GLADSTONE REGION AND HAVE REVEALED SOME INTERESTING FINDINGS ABOUT MARINE TURTLE MOVEMENTS.

Green turtles living within Port Curtis have been found to have distinct home ranges, often comprising only a few square kilometres of waterway. Despite the vast size of Port Curtis and linked waterways such as The Narrows, turtles rarely move out of their small home range where they forage on seagrass and other food sources. Satellite data, collected via computerised tags attached to a turtle's carapace (shell), enables researchers to identify which parts of the Port turtles are using. To the surprise of researchers, many tracked turtles live in close proximity to heavy industry, moving around the marine terminal structures and ships on a daily basis. Indeed, turtles and marine industry appear to happily coexist in one of Queensland's busiest ports.

Flatback turtles, however, migrate hundreds of kilometres from their coral reef foraging grounds in the Great Barrier Reef lagoon to nest at Gladstone region's beaches. Flatback turtles will spend a few months in the region, laying several clutches of eggs, before commencing their journey home again, which may be as far as 1,000 kilometers away.

ONE ASPECT OF THE LONG TERM TURTLE MANAGEMENT PLAN INVOLVES AN ANNUAL HEALTH CHECK ON GREEN TURTLES WITHIN PORT CURTIS.

Approximately 200 green turtles are checked each year through various methods, including a physical examination by a veterinarian and the collection of blood samples for analysis in the laboratory. The results of blood samples are compared with published values from pristine areas (known as reference ranges) to determine what proportion of the Gladstone turtle population have blood parameters within the 'healthy' range. Interestingly, the concentration of some elements within the blood of turtles has been found to vary with geographical location, possibly indicating that the Port is home to many groups of green turtles that may not often intermingle.

Images supplied by Eco Logical Australia

The Long Term Turtle Management Plan is unlocking many secrets of Gladstone's marine turtle populations. The monitoring program will assist in better management of marine turtles into the future, both in Gladstone and more broadly across the Great Barrier Reef.

Rio Tinto Alumina Yarwun

Home of Innovation

In 2018, Gladstone became the home of innovation – Rio Tinto's Queensland Research and Development Centre (QRDC) relocated within Australia from Brisbane to Yarwun Refinery. This makes Gladstone Rio Tinto a global centre for technology, research and development in the alumina refining process. .

In 2019, the Aluminium Stewardship Initiative (ASI) granted its Performance Standard and Chain of Custody certifications to our Yarwun alumina refinery. ASI certification means customers can be assured that the aluminium they purchase has been produced to the highest environmental, social and governance standards, ranging from greenhouse gas emissions to human rights.

In particular, Rio Tinto Alumina (RTA) Yarwun has developed a High Efficiency Sediment program to assist with their other projects developed to protect the environment as showcased below:

APPLICATION OF HIGH EFFICIENCY SEDIMENT BASINS

Space at the refinery is very constrained so traditional large sediment basins cannot be constructed for treatment of stormwater total suspended solids.

Principles of high efficiency sediment ponds are being adopted to improve water quality by trialling flocculants and staged weirs.

SENSE OF PLACE

During refinery construction plants were preserved and replanted within the refinery grounds. Name plates from the employees during start up were assigned to each plant and provided a reminder of where Rio Tinto Alumina Yarwun has come from in the last 15 years.

Today, major projects that may impact those plants are continuing to preserve plants by temporarily relocating them. Beneraby Nursery is helping out by fostering them during construction.

BOAT CREEK ECOLOGICAL WORK

Through a sense of stewardship, RTA Yarwun has undertaken ecological surveys in Boat Creek in 2020 and previously in 2017. Ecologists were impressed at the diversity present in the system and found no evidence of impacts from refinery stormwater discharges through comparison of upstream and downstream sites using AuSRiVAS methodologies.

Images supplied by Rio Tinto Alumina Yarwun

Nationally recognised research is being undertaken in partnership with RTA Yarwun, QAL, University of Queensland and the Government to understand potential opportunities for red mud as a growth medium in rehabilitation. Achieving a safe, stable and non-polluting end state for tailing facilities is important for the long-term stewardship of the catchment.

Seagrass - more than a grass!

CQUniversity

LOOKING OUT AT LOW TIDE, ACROSS PELICAN BANKS OR LILLEY'S BEACH IN THE GLADSTONE HARBOUR, YOU WILL SEE A HAZE OF GREEN FROM THE VAST MEADOWS OF SEAGRASS THAT GROW THERE.

Seagrass, the name seems to say it all, grasses that live in the sea, but they are more closely related to the water lily family. With over 60 different species (five found in Gladstone Harbour), they are unique in that they represent the only flowering plants which can live entirely in the sea.

UNFORTUNATELY, GLOBALLY, SEAGRASSES ARE DECLINING AT AN ALARMING RATE.

SEAGRASSES:

- Are critical habitats providing a long list of ecosystem services as well as benefits to humans;
- Are important nursery and foraging habitats for fish and shellfish and food for turtles and dugongs;
- Act to recycle nutrients and oxygenate the water;
- Prevent coastal erosion;
- Capture carbon, offsetting our carbon footprint; and
- Remove harmful pathogens, pollutants and microplastics from the waters that flow through them, keeping our coastal ecosystems healthy.

Previously, Gladstone Harbour has been highlighted as one of the highest risk regions in Queensland and over the last couple of decades substantial losses of seagrasses have been reported. There are some key drivers of the fate of seagrass that are beyond our control like climatic conditions, but it is clear from the 2020 GHHP Report Card that seagrass habitat is improving in the harbour. However, it is not the time to get too complacent. Coastal development and climate change drivers continue.

Good coastal management and stewardship is critical to ensuring seagrass health and resilience. It's reassuring to know that the invigoration of research as one of the key pillars in CQUniversity's growth has focused on Seagrass as one of their key areas of research specialisation, through CQUniversity Australia's Coastal Marine Ecosystems Research Centre (CMERC).

DID YOU KNOW THAT YOU CAN MAKE A DIFFERENCE?

Volunteer through CMERC's citizen scientist initiatives and join the team to assist with:

CROSS POLLINATION, TRANSPLANTING SEAGRASS & SEAGRASS RESTORATION

Researchers have been recruiting volunteers from the community to help harvest seagrass flowers to collect seeds, in a way that doesn't impact the seagrass meadows, to germinate seeds from the flowers, replant and regenerate seagrass meadows.

Through the Sea Flowers project Gladstone's locals, voluntary organisations and apprenticeship schemes will become involved in the non-destructive collection of seagrass flowers, which will contribute to the restoration of this vital flora. The seagrass flowers will be used in seed storage, germination, viability and restoration by seed studies while educating and promoting the value of these habitats to the local community.

Researchers at CMERC intend to enhance the distribution and resilience of seagrass in the good years, and manage recovery in the bad years, to ensure these amazing habitats continue to keep our coastal ecosystems and communities healthy. To find out more about seagrasses or get involved in local restoration activities, please contact cmerc-admin@cqu.edu.au.

Fitzroy Basin Association
in collaboration with the Local Marine Advisory Committee and community partners

What's Down Our Drains?

THIS IS NOT THE TYPE OF QUESTION THE AVERAGE GLADSTONE RESIDENT ASKS THEMSELVES EVERY DAY, BUT PERHAPS IT SHOULD BE!

Humans are responsible for 100 per cent of marine debris. To tackle this problem, three of central Queensland's largest towns (Rockhampton, Yeppoon and Gladstone) installed 'Drain Buddies' at key locations to capture debris before it could enter local waterways and created source reduction solutions.

WHAT IS A DRAIN BUDDY?

Drain Buddies are heavy-duty baskets installed at litter hotspot locations that only allow water to pass through, collecting all other matter including litter, organic debris and sediment. Matter collected is emptied quarterly, then sorted, analysed and recorded in the Australian Marine Debris Initiative database administered by Tangaroa Blue.

The project, which commenced in June 2019 concluded its sixth servicing and audit cycle in November 2020. Since this time, the Drain Buddies have discovered some significant results: 40,079 pieces of litter were stopped from entering the Great Barrier Reef across 27 drains throughout Gladstone, Livingstone and Rockhampton with a total weight of 1,002 kilograms (over 1 metric tonne).

To date, the project has implemented four source reduction strategies based on the data collected from the Drain Buddies audits. The data collected from the Drain Buddies has provided unrivalled insight into what was getting thrown away, where it came from and what types of source reduction campaigns provide the best results for the environment.

WHERE ARE THE DRAIN BUDDIES IN GLADSTONE?

GLADSTONE STRATEGY

In Gladstone, a strategy was rolled out in the harbour city to reduce plastic-lined sugar sachets entering drains. Since the strategy rollout, there has been a 100% reduction in the appearance of plastic lined sugar sachets in Gladstone drains. 130 plastic lined sugar sachets were recovered from Gladstone CBD drains between June 2019 and May 2020, with the mid-2020 data revealing this number had dramatically reduced to ZERO!

9 Drain Buddies were set up in the first stage however, after stage 2 was finalised, Gladstone had a total of 12 Drain Buddies.

With the help of community groups and their members, Fitzroy Basin Association continues to educate residents on wasteful behaviours and the impact on regional waterways and the Great Barrier Reef.

This project was made possible through a Local Action Community Reef Protection grant, funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, delivered by Fitzroy Basin Association Inc. (FBA), on behalf of the Capricorn Coast and Gladstone Local Marine Advisory Committees.

Protecting the Environment

With a natural deep-water port sheltered by nearshore barrier islands, the Gladstone region has one of the largest bulk commodity ports in the world. So it's no surprise to notice the multitude of massive ships loading coal at the Wiggins Island Coal Export Terminal (WICET).

WICET exports quality Queensland thermal and metallurgical coal, and provides additional export capacity at the Port of Gladstone to service new mines and expansion of existing mines in the Surat and southern Bowen Basins to transport around the world.

DID YOU KNOW?

From the very beginning, WICET was committed to addressing potential environmental impacts of the terminal, with environmental factors considered throughout the planning and design phase of the terminal.

PROTECTION AND PRESERVATION WAS TREATED AS THE BEST FORM OF ENVIRONMENTAL MANAGEMENT.

REVEGETATION

WICET established vegetation offsets to maintain natural flora and fauna systems. Revegetation of approximately 56ha. of land has occurred, using a variety of endemic species, including relocating protected flora species to alternative local sites for their preservation.

These huge rehabilitation works were aimed at re-establishing a functioning ecosystem and to provide a range of land uses, such as conservation and water quality.

FAUNA RELOCATION

Imagine the cost and effort it took to relocate hundreds of different animals accross dozens of different species during the course of the development to the Calliope Conservation Park.

This included a myriad of animals such as snakes, frogs, birds and various mammals.

2021 ACTION EXAMPLES:

- Enhance the dust detection and management capabilities. Also treat captured stormwater to reduce suspended solids.
- Recycle water from the stormwater ponds and use this for dust suppression, moisture addition across the site, as well as to feed stockyard water.

FAUNA ROPE BRIDGES

An amazing idea was implemented by WICET where fauna rope bridges were erected to reconnect habitat to either side of the development and allow the animals to cross safely.

Protected flora species were relocated to alternative local sites for preservation.

Images supplied by WICET

WICET will continue their values of environmental protection and sustainability for the harbour by:

- Limiting operational environmental impacts of the Terminal through the efficient and sustainable use of resources and materials.
- Use of sustainable and environmentally effective industry methods and technologies.
- Respect for the cultural heritage and historical links to the land on which we operate.

Enriching Environmental Education

LOOKING AFTER OUR ENVIRONMENT IS SO, SO IMPORTANT AND WHO BETTER TO START TRAINING THAN OUR YOUNGSTERS!

Education can be more than what's taught in the classroom and can last long after children have finished school, so it is critical to have children involved with environmental, hands-on learning experiences!

WHO ARE THEY?

THE BOYNE ISLAND ENVIRONMENTAL EDUCATION CENTRE (BIEEC) is a residential and day visit education facility operated by the Department of Education, Queensland, providing programs for students Prep to Year 12. The mission is to add value to school-based curriculum by delivering authentic, stimulating, real world learning experiences beyond the capacity of the classroom.

Offering innovative and enriching environmental education facilitated by passionate and highly skilled staff, BIEEC has completed the following projects:

CARING FOR CLOWNFISH PROGRAM

A community training and education event involving guest speakers, who assisted in the education and promotion of reef care and volunteer training to care for Clownfish.

AUSTRALIAN MIRCO PLASTICS ASSESSMENT PROJECT

Staff and some student groups conducted four collections throughout the year to determine the levels of micro plastics on Tannum Sands main beach.

HARBOUR WATCH IS COMPLETING:

- Water quality monitoring workshops with Gidarjil to assist up-skilling Indigenous rangers.
- Sampling with community groups like Gidarjil and Conservation Volunteers Australia (CVA).

The Boyne Island Environmental Education Centre values and promotes an inclusive culture through deep connection with our community and schools to continue 'Empowering Extraordinary Minds' through engaging students in meaningful environmental experiences.

Cleaning Up the Gladstone Region

We've probably all seen pictures of marine wildlife caught up in plastic, and so are aware on some scale how devastating marine debris is to our environment. Fortunately, we have organisations like Tangaroa Blue Foundation, which is an Australia-wide not-for-profit organisation dedicated to the removal and prevention of marine debris; one of the major environmental issues worldwide.

Marine litter is human-created waste that has deliberately or accidentally been released into the sea or ocean. Deliberate disposal of wastes at sea is called ocean dumping. Naturally occurring debris, such as driftwood and drift seeds, is also present.

To collect statistics that help drive changes that reduces marine debris, Tangaroa Blue Foundation created the Australian Marine Debris Initiative (AMDI) Database, which now houses over 18 million data points. The AMDI Database is contributed to by a national network of onground volunteers, communities and partner organisations who also collaborate on source reduction projects that aim to stop the flow of litter at the source.

DISTURBING STATISTICS

Tangaroa Blue Foundation is devoted to reducing marine debris.
Since the organisation was founded in 2004 to 2021,

26,798 glass and ceramic items

85,906 plastic bits

36,559 cigarette butts and filters

have been collected in the Gladstone region.

77 community clean-ups have taken place throughout 2021 by 568 wonderful volunteers in iconic regional locations including:

- Curtis Island,
- Facing Island,
- Lilley's Beach and
- Eurimbula National Park.

SO MUCH WORK FOR AMAZING OUTCOMES

Tangaroa Blue Foundation's amazing clean-ups in 2021 collected an extraordinary total of 20,628 items of debris including many large, bulky items, such as large plastic drums and pallets, weighing a total of 2,275 kilograms, which were collected, collated and removed from the greater Gladstone environment.

EVERY INDIVIDUAL MUST CONTINUE TO DO THEIR PART TO ENSURE RUBBISH DOESN'T END UP IN OUR MARINE WATERS! AND YES, THAT MEANS YOU TOO!

Everyone can help by being mindful and careful not to litter our harbour. In addition, you can help by assisting with Gladstone Region's ReefClean Community Clean-ups, which are continually being held quarterly within the Gladstone region. For more information about when and where clean-ups will be held, email reefclean@tangaroablue.org or visit www.reefclean.org.

Healthy Fish, Healthy Harbour

GHHP has, and continues to, respond to stakeholder feedback in monitoring the health of the harbour. For example, following strong interest in fish health from the local recreational fishing community, new metrics were added to the report card to cover the health of a range of fish species important to both recreational and commercial fishers. The inclusion of fish health assessments came as a response to consultation that asked community members what they'd like to see monitored in the report card.

Through that consultation, the health of recreational fishing activities consistently ranked as the most cited response. For that reason, GHHP became interested in expanding their monitoring from a focus on stock-related issues (based on fish recruitment measures) to include direct measures of fish health, weight and length.

ASSESSING FISH HEALTH, GHHP RAN A PROJECT TO DEVELOP A NEW INDICATOR OF FISH HEALTH FOR INCLUSION IN THE GLADSTONE HARBOUR REPORT CARD.

The new indicator is called the Health Assessment Index (HAI) and was successfully piloted, along with a range of other possible indicators, by a team at CQUniversity's Coastal Marine Ecosystems Research Centre (CMERC).

The HAI was adopted within the Gladstone Harbour Report Card system in 2018 and has continued to be monitored annually. So far, there have been no findings to indicate a systemic problem with fish health in Gladstone Harbour. In 2019, the overall score for fish health was a 'B'. Critical to the HAI's successful adoption was the diligence undertaken to ensure the new index is based on protocols that are cost-effective, but not overly complex technically.

Through innovations, there are now three indices related to fish health in the Gladstone Harbour Report Card: fish recruitment, the HAI and the crowdsourced data. Port Curtis Coral Coast Indigenous communities are also involved in the Gladstone Harbour reporting.

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The benefit of broadening the monitoring goes beyond providing industry, government and stakeholders with an annual score. Over time, as data accumulates, it will be possible to start to detect emerging and long-term trends and patterns in the health of this working harbour.

GHHP continues to improve the report card system to provide deeper and more sophisticated insights into the future for fish health. For more information, visit www.ghhp.org.au.

Reference: Healthy Fish, Healthy Harbour, article written by Gio Braidotti. FISH Magazine, Fisheries Research & Development Corporation News. Vol 29 No 1, March 2021

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Tangaroa Blue

Healthy Harbour, Healthy Future

GLADSTONE HARBOUR
2020 REPORT CARD

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