

Pancake Creek Moorings Program

Benthic Assessment, October 2020

Report produced for Gladstone Ports Corporation's Biodiversity Offset Strategy. 14 pp.

This report has been produced for Gladstone Ports Corporation's Biodiversity Offset Strategy. The study was undertaken through a Memorandum of Understanding between Gladstone Ports Corporation and Queensland Parks and Wildlife Service, Department of Environment and Science the installation and monitoring of Environmentally Friendly Moorings (EFM's) and Reef Protection Markers (RPM's) within Pancake Cree

This publication has been compiled by Queensland Parks and Wildlife Service, Department of Environment and Science.

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Pancake Creek Moorings Program Benthic Assessment October 2020



Report to Queensland Parks and Wildlife and Gladstone Ports Corporation

October 2020

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Introduction

Pancake Creek is located on the Central Queensland coast approximately 20km north of the township of 1770. It is a popular anchorage for yacht's and coastal cruisers making their way along the coast. It is also a popular destination for local fishermen and boating based campers.

Pancake Creek supports of diverse range of habitats including mangrove, seagrass, tidal flats and coral reefs. The estuarine system is home to migratory seabirds, marine turtles, dugongs and numerous fish species. The coral reefs and seagrass beds are susceptible to anchor damage.

To aid in the protection of these habitats a number of environmentally friendly vessel moorings and reef protection markers were installed at the end of 2018. The Gladstone Ports Corporation provided funding for the installation of environmentally friendly moorings and reef protection markers under a Biodiversity Offset Strategy.

The original proposal was to use a pin mooring, which are drilled into the substrate to a depth of 2-4m. Due to the substrate consisting of impenetrable rock, cement blocks were installed to anchor the moorings.

The purpose of this report is to provide a report on the second year annual monitoring of habitat condition at the mooring sites after their installation, condition of environmentally friendly vessel moorings and reef protection markers as well as usage. An initial baseline survey was conducted and reported on in June 2018. The first year's annual report was conducted and reported on in September 2019 to allow for improved visibility and the optimal timing for seagrass growth.

The Pancake Creek moorings and reef protection program complements a large moorings and reef protection program that extends throughout the Great Barrier Reef. The program aims to reduce the impacts of anchor damage on sensitive coral reef and seagrass communities. The program also aims to raise awareness about the impact of anchor damage, and how responsible operations of vessels can improve the resilience of reef and seagrass ecosystems.

Methods

Two study sites were selected (B3 and S2), one from within each of the two main mooring sites (refer Figure 1). Two divers on scuba were used to survey the sites. The sites were strongly influenced by strong tidal currents and poor visibility, limiting survey techniques and timing.

At each site within a 10m radius of the selected mooring site, 20 x 0.5m quadrats were deployed at random and photographed using a Lumix DMC-FT1. These images were then analysed for percentage cover of the benthos.

Analysis was undertaken adopting the methodology of the Rapid Health Impact Survey (RHIS) developed by the Great Barrier Reef Marine Park Authority. An additional category of seagrass was added to the RHIS benthos categories (macro algae, live coral, rock, rubble, and sand) to capture the presence of seagrass species within the survey.

Results

General site description

Mooring site B3 is located approximately 3 km upstream from the main entrance mouth of Pancake Creek. This site is a popular anchorage for yachts and powered vessels. In 2018, anchor damage to coral was observed along with rock that had been scoured of surface benthos. During the 2019 survey the substrate was dominated by sediment containing decaying bivalve shells. This sediment covered most of the previously exposed rock and sand sediments. During the 2020 survey the substrate was dominated by sand and coral cover has increased.

The water depth at Mooring site B3 is 9.6m at highest astronomical tide (HAT). The substrate consists of coarse sand, with rock ridges protruding from the sand. During attempts to install a pin mooring rock was found approximately 0.5m below the sand substrate.

Mooring site S2 is located closer to the mouth of the creek, approximately 1 kilometre. Vessels often anchor here to access the adjacent beach and camping area. There is also a significant area of coral reef to the south which can be accessed for snorkelling from this anchorage.

The water depth at Mooring Site S2 is 7.5m at HAT. The substrate consists of fine sand. Rock was also detected below the surface substrate not enabling pins to be placed as mooring anchors. Some scouring around the block was observed, this is due to the high tidal movement through the area.

Pancake Creek Mooring Benthic Assessment

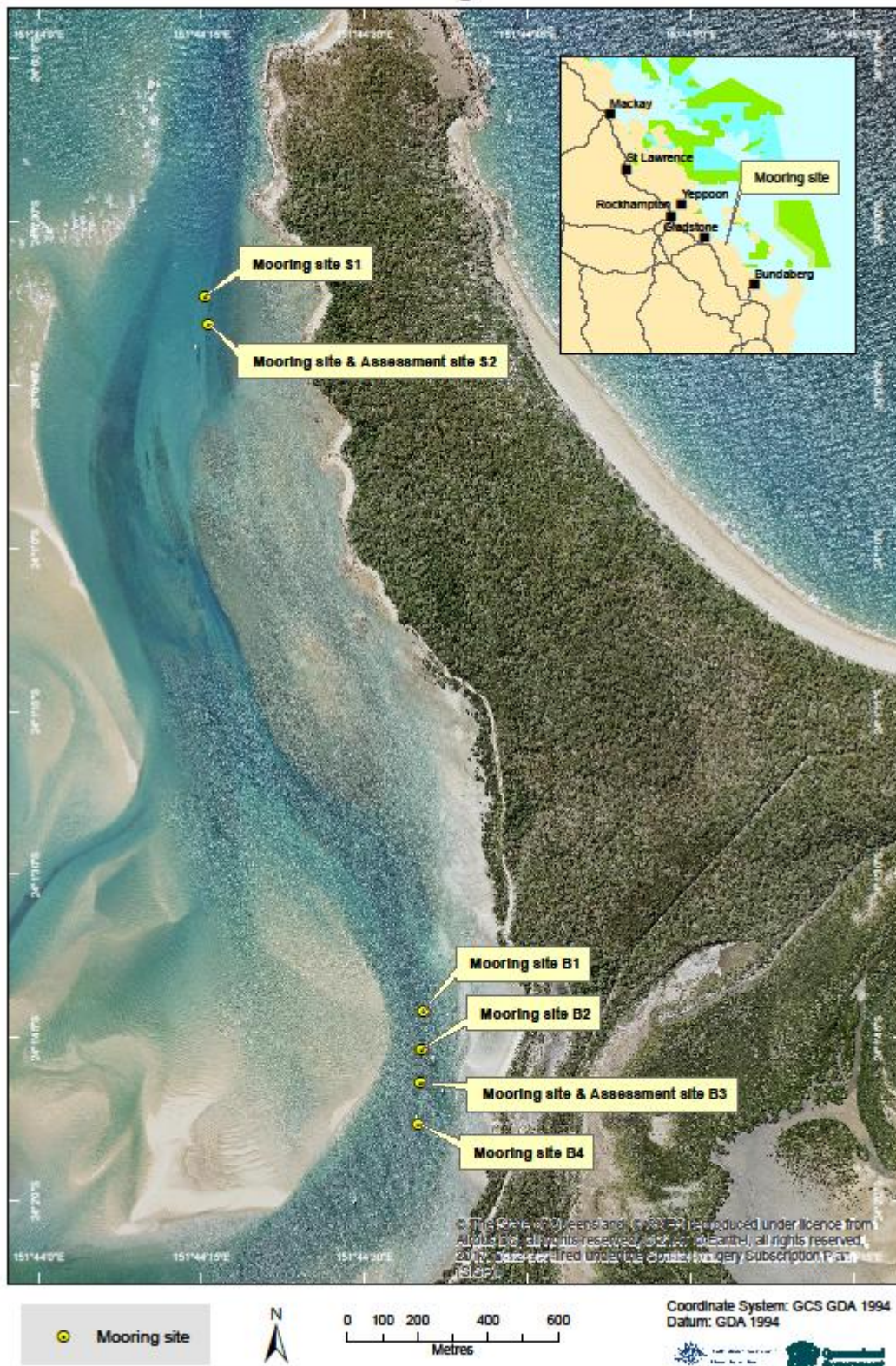


Figure 1 Map showing location of mooring and assessment sites.

Photo quadrat analysis

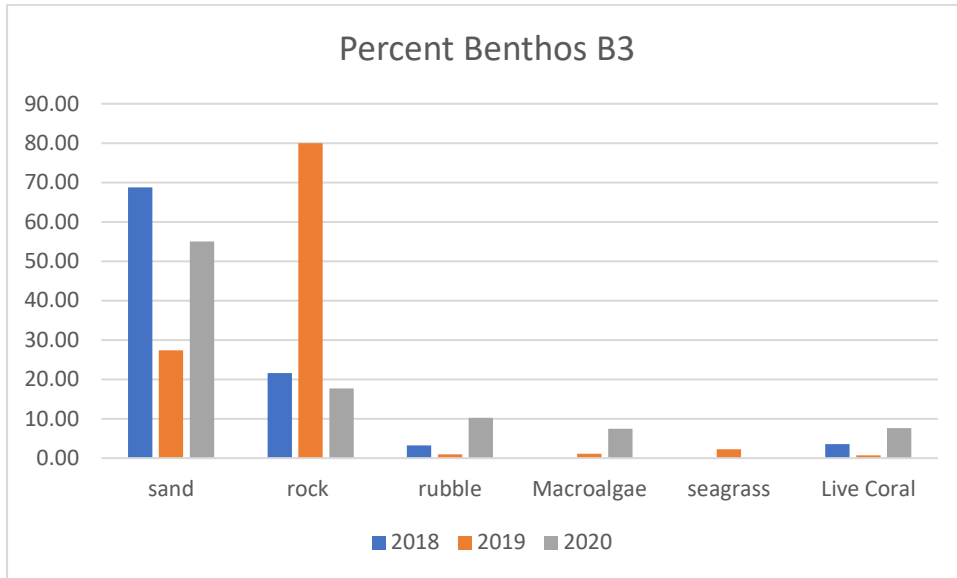


Figure 2 Graph showing the average percentage benthos cover at survey site B3, June 2018, September 2019 and October 2020.

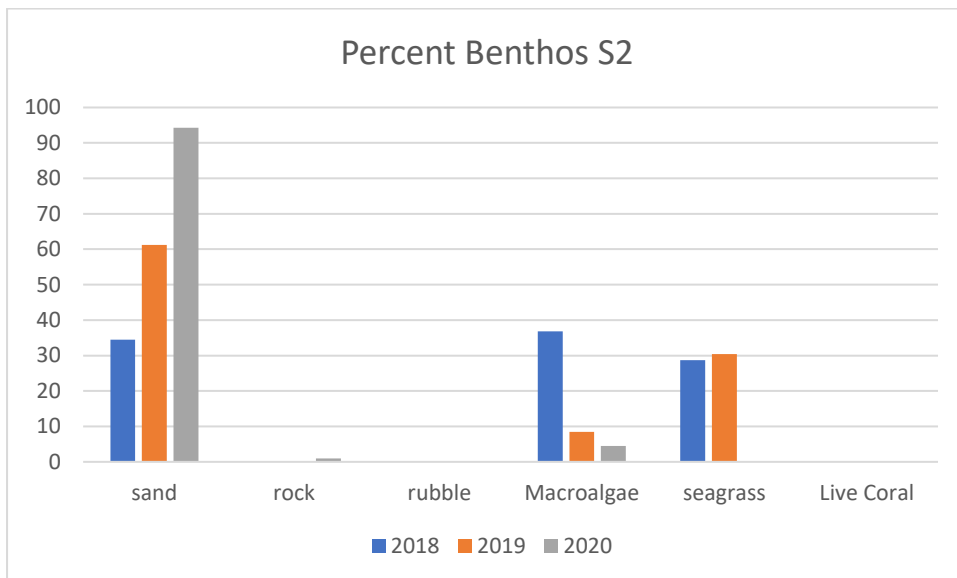


Figure 3 Graph showing the average percentage benthos cover at survey site S2, June 2018, September 2019 and October 2020.

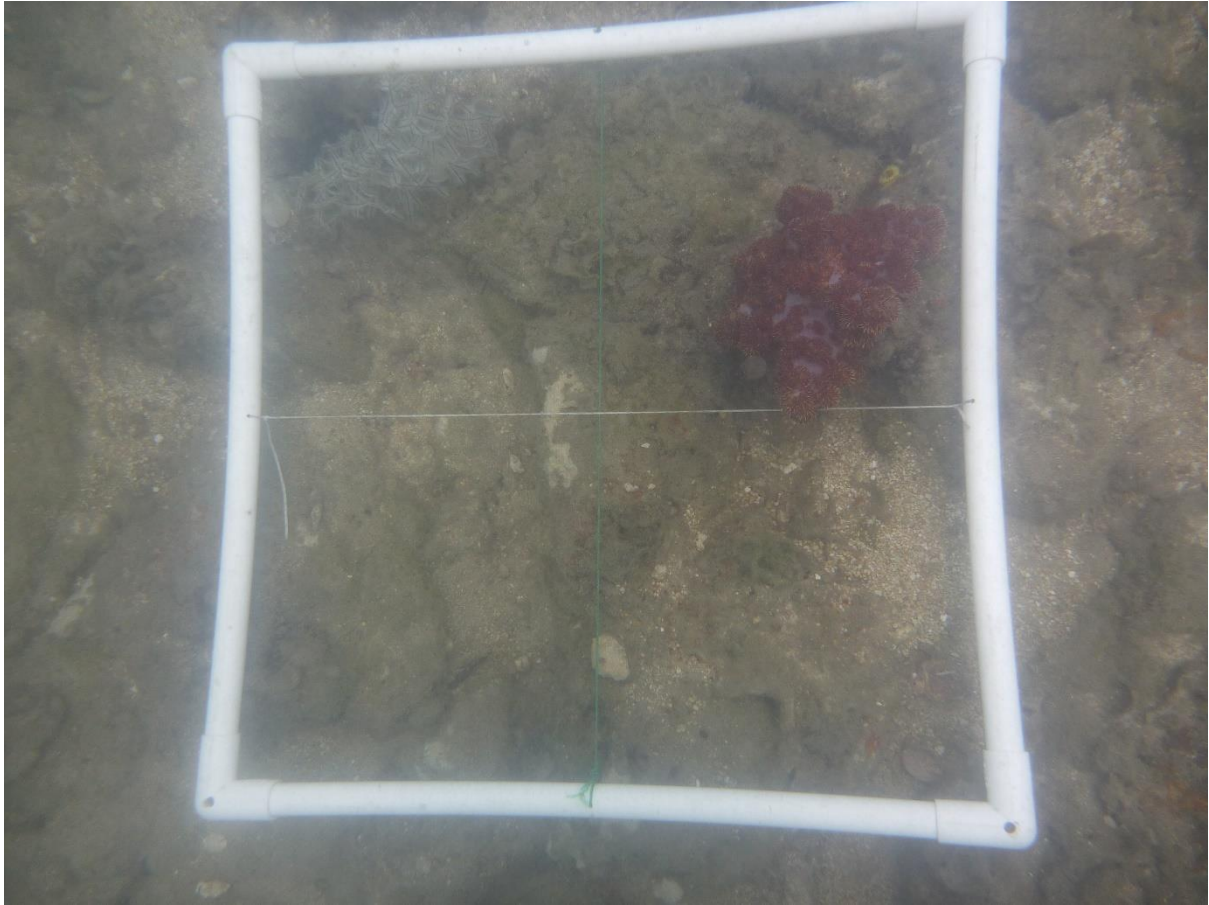


Figure 4 Image showing benthos cover (live coral) at Site B3 in October 2020.



Figure 5 Images of coral species at site B3 in October 2020.

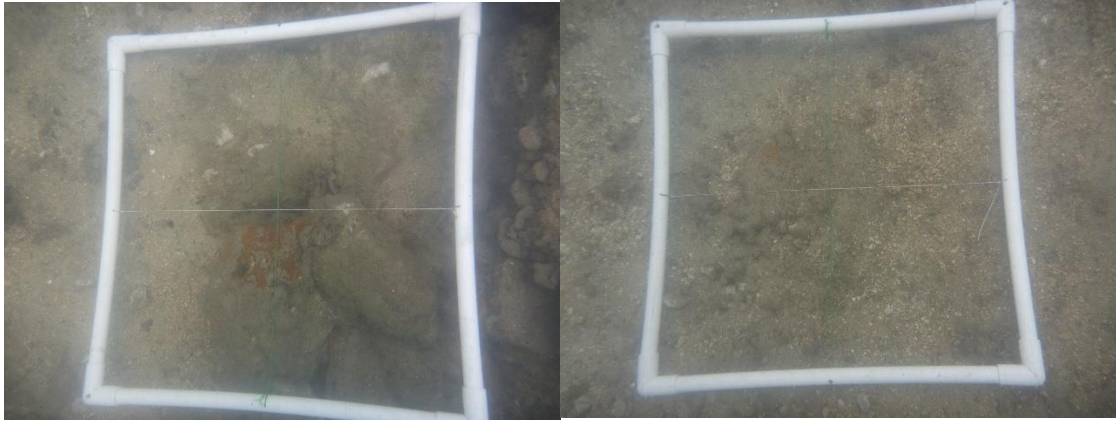


Figure 6 Images showing examples of substrate at site B3 in October 2020.

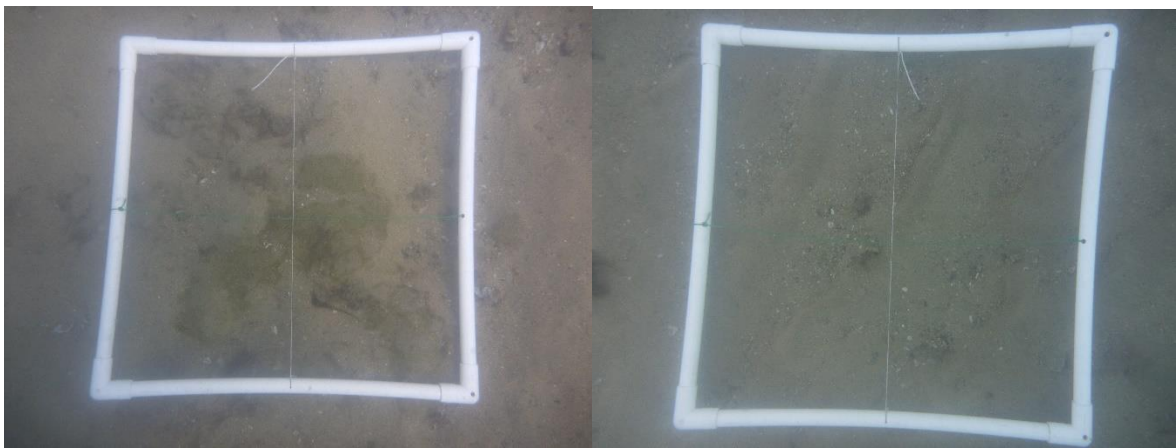


Figure 7 Images showing examples of substrate at site S2 in October 2020.

Usage

Table 1 Mooring usage

Date	QPWS Vessel	Trip purpose	Mooring usage observations
16/04/2020	Reef Heron	Mooring maintenance	2 recreational vessels on moorings
6/07/2020	Pantala	Compliance	4 recreational vessels on moorings
8/10/2020	Reef Guardian	Mooring maintenance	3 recreational vessels on moorings



Figure 8 Image of vessel on mooring B2 in Pancake Creek 8 October 2020

Condition

Table 2 Reef Protection Marker Maintenance

3	3.1	7.8	8.8	22mm Bow Galv	20mm gal thimble	20mm silver rope	200 mm foam	20mm gal thimble	22mm Bow Galv	22mm Bow Galv	5/8 Gal swivel	11/10/2018	11/10/2018	10/08/2020	
4	4.1	8.8	9.8	22mm Bow Galv	20mm gal thimble	20mm silver rope	200 mm foam	20mm gal thimble	22mm Bow Galv	22mm Bow Galv	5/8 Gal swivel	11/10/2018	11/10/2018	10/08/2020	replace swivel
5	5	9.7	10.7	22mm Bow Galv	20mm gal thimble	20mm silver rope	200 mm foam	20mm gal thimble	22mm Bow Galv	22mm Bow Galv	5/8 Gal swivel	11/10/2018	11/10/2018	10/08/2020	replace swivel
6	1.1	5.8	6.8	22mm Bow Galv	20mm gal thimble	20mm silver rope	200 mm foam	20mm gal thimble	22mm Bow Galv	22mm Bow Galv	5/8 Gal swivel	11/10/2018	11/10/2018	10/08/2020	retackle

Table 3 Mooring Maintenance

Reference number	MSQ number	Current Down line length (m)	Pick up line length and type	Bottom Shackle & SS split pin	Tested Swivel	Top shackle	Thimble	Mooring Line	Mid Riser buoy	Buoy Lanyard	Lanyard Thimble	Lanyard Shackle	Anchor	Installation date	Inspection Sep 2020	Works Required Jan Round
B1	250	11.1	2 x 4m each length 24mm polyprop	8.5T Tested Safety Bow	Tested 7.2T	9.5T Tested Safety Bow	44mm	48mm square stabilized polyprop	A4	38mm square poly prop	38mm	25mm Gal bow with SS bolt and Nylock	2 x 5T concrete blocks chained	9/13/2018	10/08/2020	
B2	251	12.5	2 x 4m each length 24mm polyprop	8.5T Tested Safety Bow	Tested 7.2T	9.5T Tested Safety Bow	44mm	48mm square stabilized polyprop	A4	38mm square poly prop	38mm	25mm Gal bow with SS bolt and Nylock	2 x 5T concrete blocks chained	9/12/2018	10/08/2020	replace buoy lanyard
B3	252	11.6	2 x 4m each length 24mm polyprop	8.5T Tested Safety Bow	Tested 7.2T	9.5T Tested Safety Bow	44mm	48mm square stabilized polyprop	A4	38mm square poly prop	38mm	25mm Gal bow with SS bolt and Nylock	2 x 5T concrete blocks chained	9/12/2018	10/08/2020	replace riser float
B4	253	11.6	2 x 4m each length 24mm polyprop	8.5T Tested Safety Bow	Tested 7.2T	9.5T Tested Safety Bow	44mm	48mm square stabilized polyprop	A4	38mm square poly prop	38mm	25mm Gal bow with SS bolt and Nylock	2 x 5T concrete blocks chained	9/12/2018	10/08/2020	
S1	254	10.75	2 x 4m each length 24mm polyprop	8.5T Tested Safety Bow	Tested 7.2T	9.5T Tested Safety Bow	44mm	48mm square stabilized polyprop	A4	38mm square poly prop	38mm	25mm Gal bow with SS bolt and Nylock	2 x 5T concrete blocks chained	9/13/2018	10/08/2020	
S2	255	7	2 x 4m each length 24mm polyprop	8.5T Tested Safety Bow	Tested 7.2T	9.5T Tested Safety Bow	44mm	48mm square stabilized polyprop	A4	38mm square poly prop	38mm	25mm Gal bow with SS bolt and Nylock	2 x 5T concrete blocks chained	4/16/2019	10/08/2020	



Figure 9 Map of reef protection markers and moorings

Discussion

The 2020 survey was slightly later than scheduled due to weather and tide considerations. No obvious anchor damage was observed at either monitoring site.

An increase in sand at site B3 is likely indicative of the dynamic nature of the creek (figure 2). With large tidal currents moving substrate around the creek bed. Coral cover has increased at site B3. There is evidence of recruitment with small colonies of hard corals observed. This possibly indicates a recovery of the site however longer-term monitoring of the site would need to be undertaken to confirm this.

There was a substantial decline in the seagrass coverage at site S2 (figure 3). Seagrass is seasonal and is driven largely by environmental driver like nutrients and turbidity. There was no seagrass and macroalgae observed adjacent to the site, indicating that it is likely a seasonal reduction in coverage. Seasonal monitoring would provide a great knowledge of seagrass health at the site. There were no obvious signs of anchor impacts at the site.

The overall condition of the moorings was good (table 2 & 3). Growth and wear on tackle was in line with other inshore areas of the Great Barrier Reef (GBR). There is an issue with the mooring buoy rubbing against the vessel when conditions are wind against tidal current. This issue does occur elsewhere in the GBR and solutions are being trialled.

We have observed good usage of the moorings (table 1) as Pancake Creek is used as a holiday/recreational fishing destination by people travelling through the region and locals. Both coastal travellers on yachts and coastal cruisers frequent this region all year round. I

Overall, the moorings appear to be effective in reducing the impacts of anchor damage based on the data available.