

Pancake Creek Moorings Program

Benthic Assessment, September 2019

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 September 2019



Report to Queensland Parks and Wildlife and Gladstone Ports Corporation

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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 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 an assessment of habitat condition at the mooring sites after to their installation. An initial survey was conducted and reported on in June 2018.

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.

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

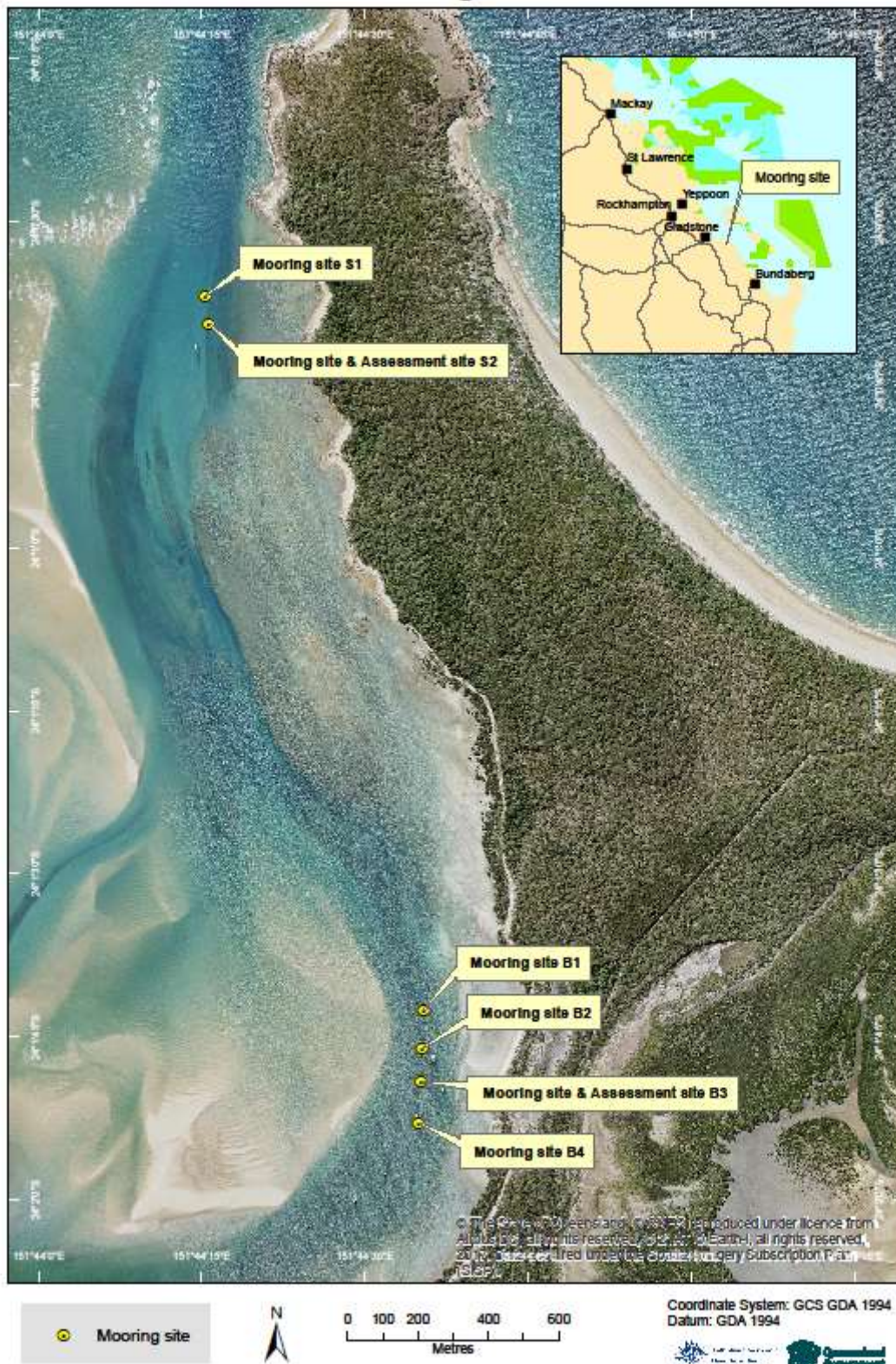


Figure 1 Map showing location of mooring and assessment sites.

Photo quadrat analysis

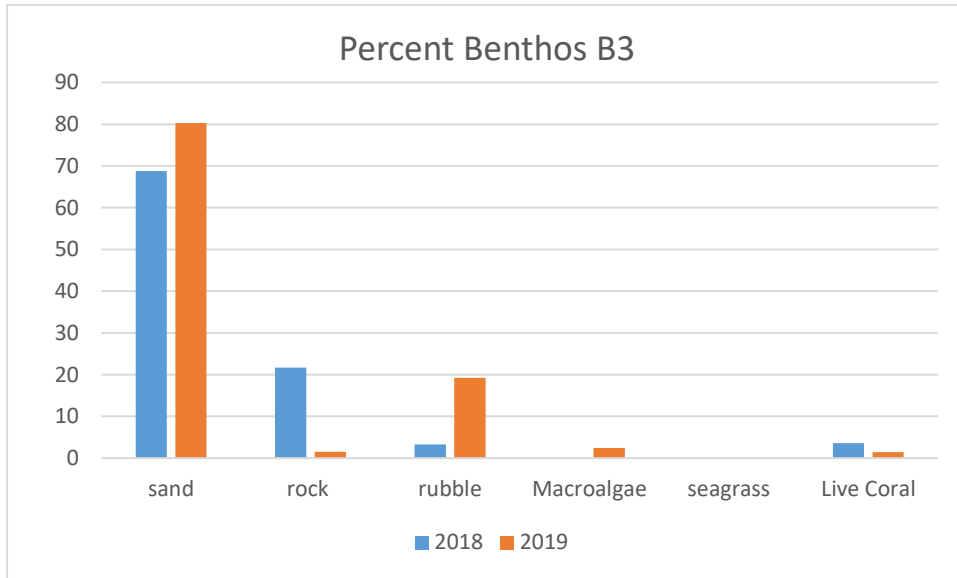


Figure 2 Graph showing the average percentage benthos cover at survey site B3, June 2018 and September 2019.

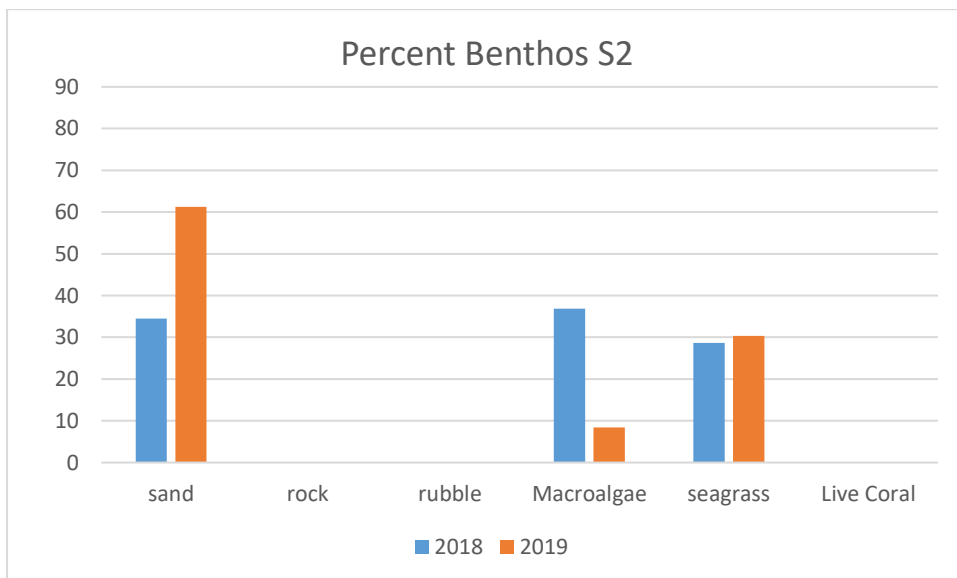


Figure 3 Graph showing the average percentage benthos cover at survey site S2, June 2018 and September 2019

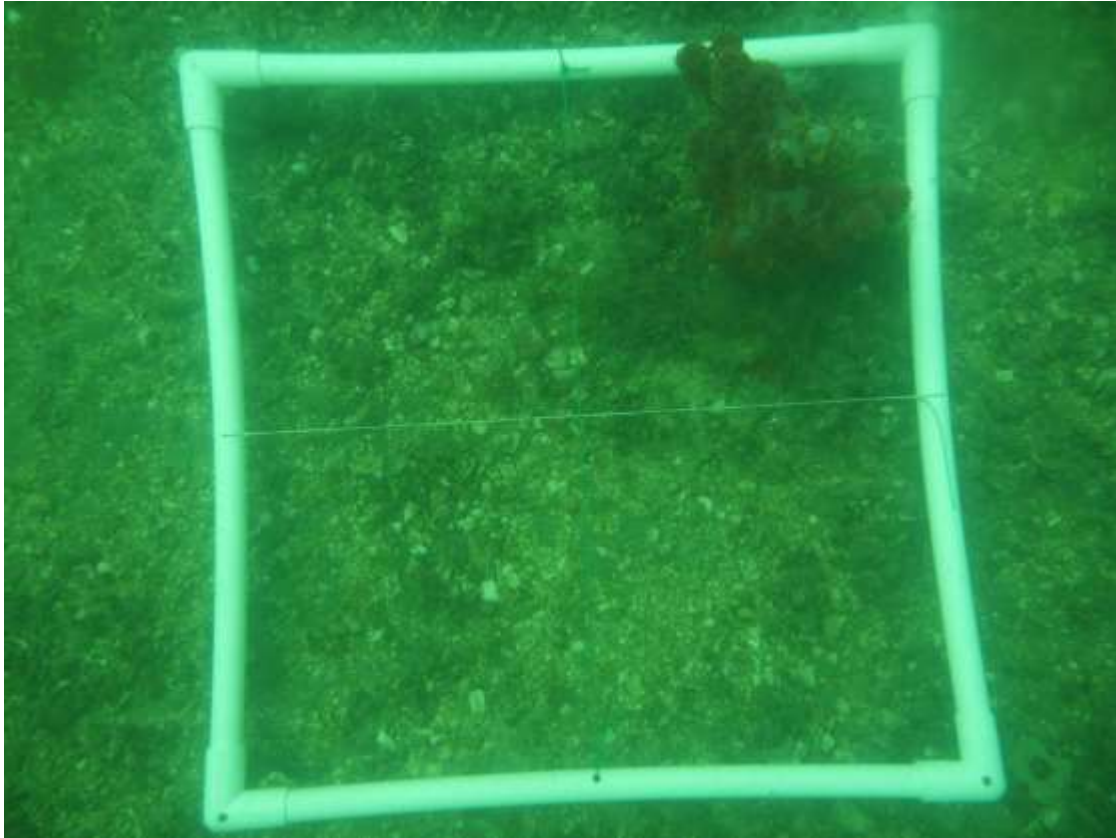


Figure 4 Image showing benthos cover (live coral) at Site B3.

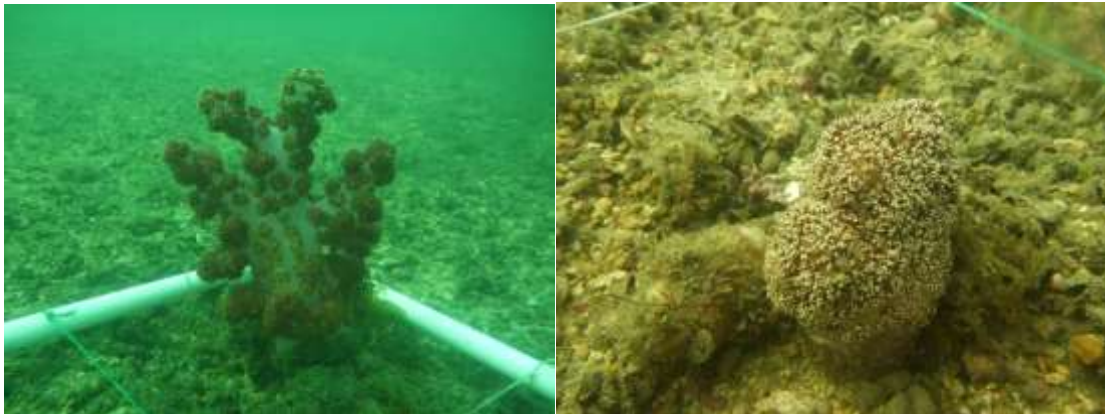


Figure 5 Images of coral species at site B3.

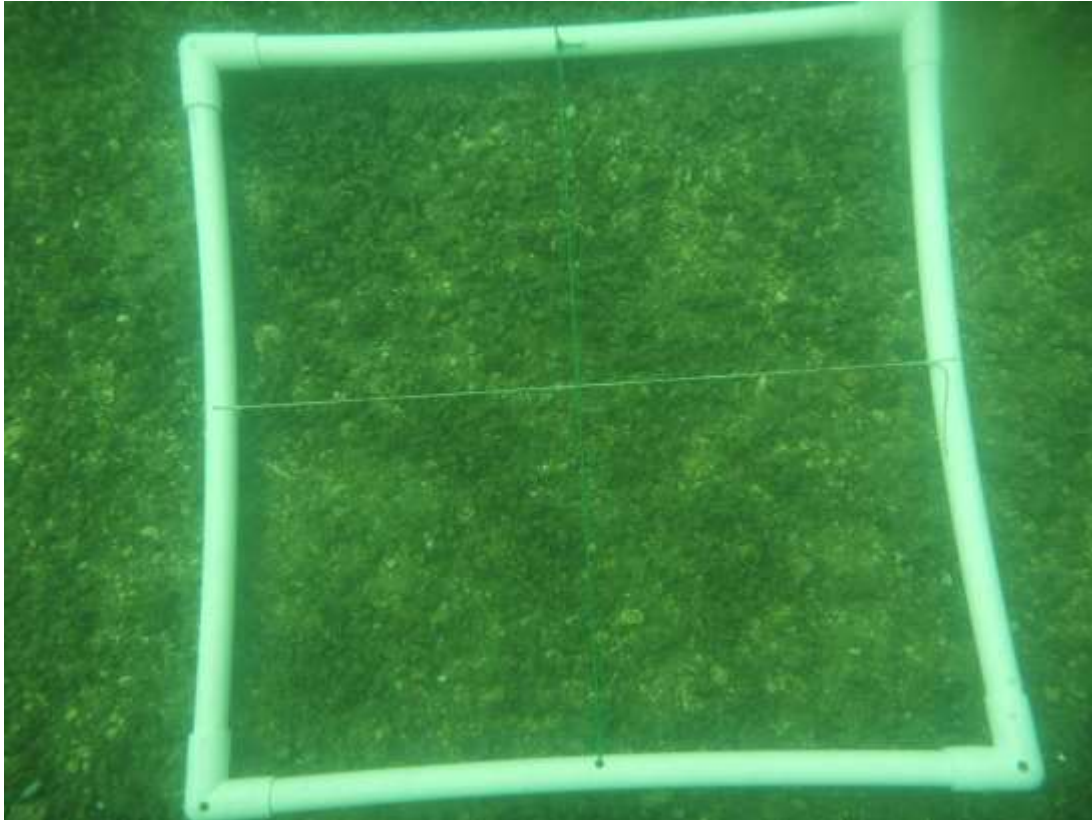


Figure 6 Images showing bivalve dominated substrate at Site B3.

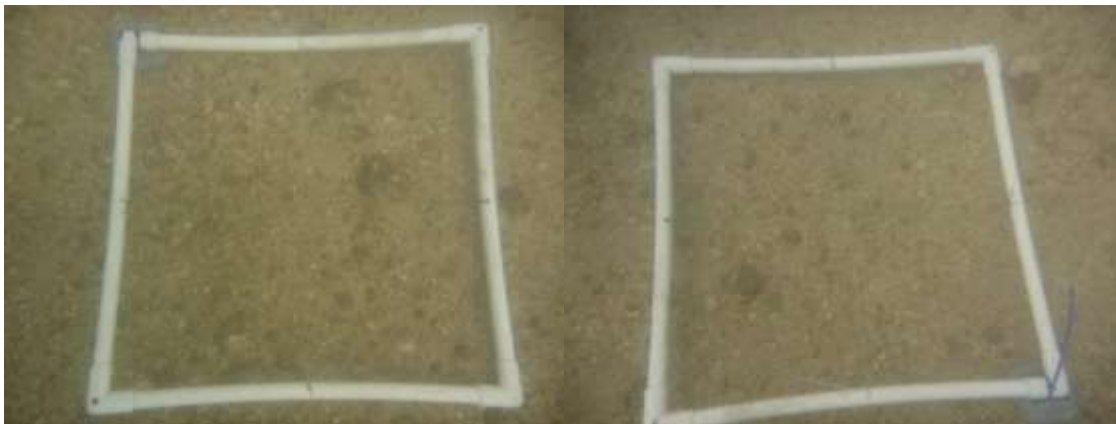


Figure 7 Images showing typical substrate from 2018 survey and at Site B3

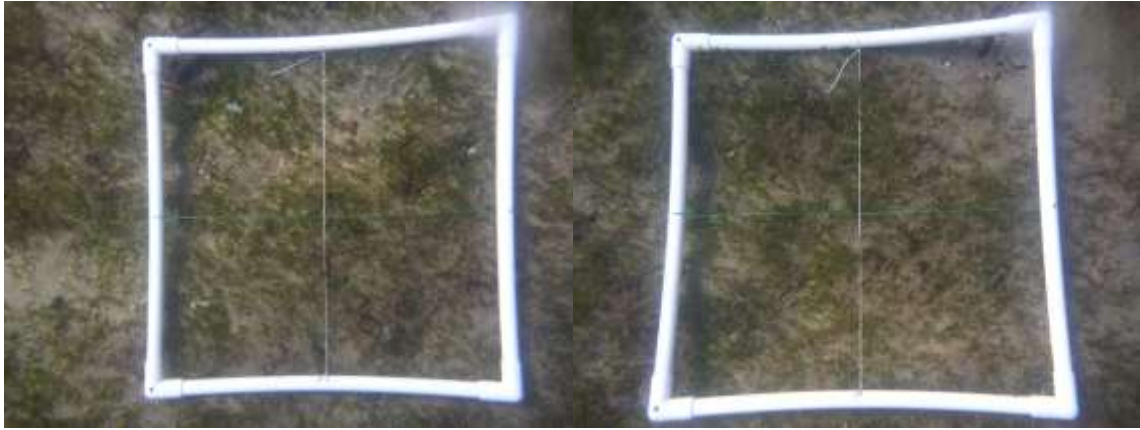


Figure 8 Images showing seagrass coverage at Site S2.

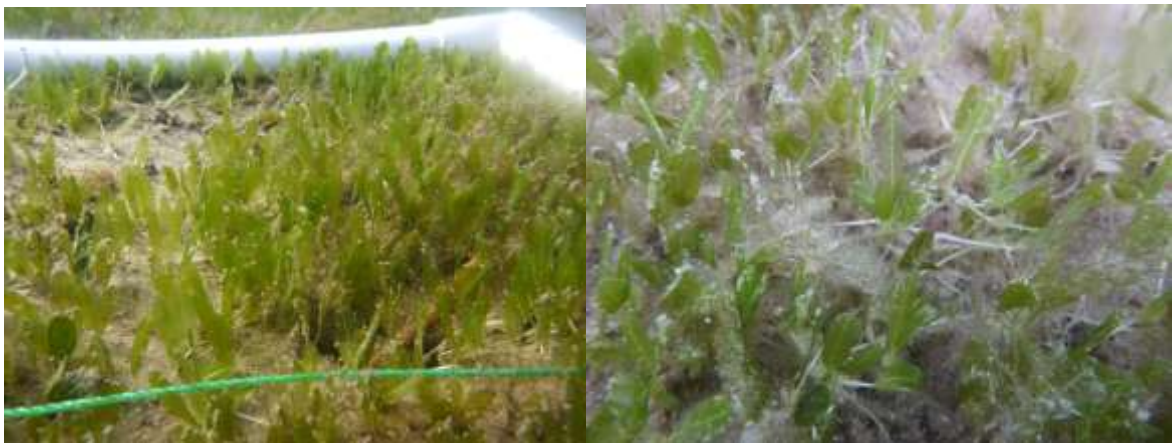


Figure 9 Image showing 2 species of seagrass near S2.



Figure 10 Image showing spawning aggregation of sea urchins near S2 Mooring.



Figure 11 Image showing sponge and feather star near S2.

Discussion

The 2019 survey was conducted later in the year in September to allow for better visibility and the optimal timing for seagrass growth. There was no evidence of anchor damage or chain drag at site B3. During the survey it was noted that there had been a significant change in the substrate at site B3. The new substrate consisted of masses of deteriorating bivalve shells (Figure 6). The substrate observed in the previous survey was dominated by coarse sand (Figure 7). To fit the benthos classification the new substrate type was included under the sand category. The introduction of the new substrate is likely due to the dynamic nature of the creek system and has been shifted by tidal currents. Due to a smothering effect of the new substrate the benthos percentages (Figure 2) have changed with a reduction in rock substrate and to a lesser extent live coral cover. The lack of hard rock surface does reduce the potential for recruitment of coral. There were soft corals at the site (Figure 4) and observed in adjacent area outside the immediate survey area.

Substrate conditions remain relatively similar to the previous year at S2. No anchor damage or disturbance to the seagrass beds were observed at the site. The most notable change was the reduction in macroalgae at the site (Figure 3). This reduction is likely due to the later survey period falling outside of the optimal growing period for the algae (post wet season). The increase in the sand cover is directly as a result of reduced macroalgae cover. There was an increase in the seagrass cover with 2 species of seagrass observed, *halophila decipiens* and *halophila ovalis* (Figure 8 & 9). Dense seagrass beds extend to the North and West of the site.

A large spawning aggregation of sea urchins was observed around the mooring block at S2 (Figure 10). The proximity of the urchins to the block would indicate a preference for the habitat it provides. Other invertebrate species were also observed at the site including sponges, starfish and ascidians (Figure 11).