



**PORT OF WEIPA POST WET
SEASON SEAGRASS HABITAT UPDATE:
May 2019**

McKenna SA & Rasheed MA

Report No 19/21

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KEY FINDINGS

- North Queensland Bulk Ports commissioned additional seagrass assessments for the Port of Weipa in May 2019 to check on the status of seagrasses post severe wet-season events to assist in informing potential management actions should they be required.
- Assessments were made of three of the five core monitoring meadows within the port and found that seagrasses in these meadows were in a good condition.
- The recovery of coastal meadows between Evans Landing and Lorim Point recorded in 2017 and 2018 (meadows A6 and A7) was sustained through the 2018/2019 wet season.
- Overall seagrasses in Weipa did not appear to have suffered any dramatic or sustained impacts from the wet season storm and flooding events. It is likely seagrasses were in a reasonably resilient state leading into planned maintenance dredging with biomass and area of the meadows assessed remaining in good condition.
- More difficult to assess was what costs, if any, there were to the stored energy reserves of seagrasses in the port. As we move into the time of year where local seagrasses take advantage of higher light availability in the dry-season, it would be ideal to minimise interactions between maintenance dredge plumes and adjacent seagrass meadows.



Evans Landing to Lorim Point seagrasses May 2019.

1 SCOPE OF WORKS

The 2018/2019 wet season in Weipa was an extreme wet season for the region with three tropical cyclones (TC); TC Owen, TC Penny and TC Trevor, and an extensive monsoonal system affecting the region between December 2018 and March 2019. Light and water quality loggers deployed in the Weipa area recorded longer than normal sustained low light and sedimentation throughout this wet season. In addition NQBP reported significant sediment movement into the ports' navigational channel, berth and apron areas; 2,650,000m³ of sediment above design. As a result, the 2019 maintenance dredging campaign beginning June 2019 will be a larger campaign than is typical. To assist in management and planning of the 2019 maintenance dredging NQBP commissioned additional seagrass assessments for the Port of Weipa in May 2019 to check on the status of seagrasses post severe wet-season events and pre-dredging.

The additional seagrass assessment was a supplement to the scheduled quarterly permanent transect seagrass surveys for this time of year. The scope of works included assessing;

- Meadows between Evans Landing and Lorim Point (A6 & A7 meadows; Figure 1); closest to port activity and maintenance dredging;
- Meadow A2 (Figure 1); opposite port activity, parallel to maintenance dredging activity and closest to Hey Point facility;

These meadows have light and temperature logging stations (4 total), and all stations recorded low light signatures in the data between December 2018 and March 2019. The goals of the additional May 2019 surveys were to:

- Enable us to assess any changes in seagrass condition as a result of the extreme wet season;
- Provide assurance that maintenance dredging is not falsely implicated if there have been declines since the September 2018 annual survey, and if there are further declines noted in future quarterly permanent transect surveys and the annual survey scheduled for September 2019;
- Assist in informing potential management actions should they be required before the 2019 maintenance dredging campaign;
- Provide important information on the trajectory of change and implications for the longer term management of these seagrass meadows.

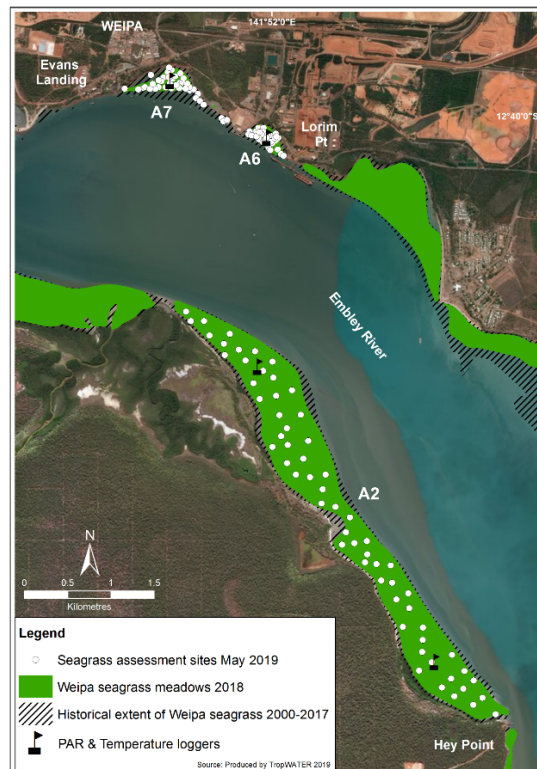


Figure 1. Location of meadows surveyed and survey sites in May 2019.

2 METHODS

Seagrass surveys were conducted 8th – 9th May 2019. Three of the five core monitoring meadows in the Intensive Monitoring Area (IMA) were selected for these additional surveys (meadows A2, A6 & A7) (Figure 1). These meadows were selected because they were representative of the dominant seagrass meadow communities identified in the port, and because they were located in seagrass areas most likely to interact with upcoming maintenance dredging.

Seagrass meadows were assessed using standard aerial helicopter surveys (Figure 2). The boundary of each seagrass meadow was mapped, and the area, species composition and above-ground biomass in the three monitoring meadows was determined using the established seagrass monitoring techniques for the long term seagrass monitoring program (see McKenna and Rasheed 2019).

At each site surveyed, seagrass meadow characteristics including seagrass species composition, above-ground biomass, seagrass and algal percent cover, sediment type and position fixes (GPS; $\pm 5\text{m}$) were recorded. For a full description of methods see the latest Weipa annual seagrass monitoring report: McKenna and Rasheed 2019.



Figure 2. Seagrass methods using helicopter aerial surveillance.

3 RESULTS & DISCUSSION

A total of 132 seagrass habitat characterisation sites were surveyed in May 2019, with seagrass present in 98% of sites. Four species of seagrass were identified in the survey (Figure 3).

There was no indication that the severe wet season had a major impact on seagrass in the Port of Weipa (Figure 4). Seagrass in the three meadows surveyed were in a good overall condition, maintained an extensive footprint and maintained a similar meadow composition of the dominant species *Enhalus acoroides* to the 2018 annual survey (Figure 4; McKenna and Rasheed 2019). The biomass, area and species composition recorded in the three meadows were within the range of previous annual monitoring results and were at or above the long-term averages (Figure 4). These results were also comparable to the few previous surveys that have been conducted at a similar time of year (McCormack et al. 2011).

Previous experience from the monitoring program has shown that generally seagrasses have been able to persist in Weipa following various weather events and natural periods of low light throughout the wet season. *Enhalus acoroides* is a persistent species that has a large storage of carbohydrate energy reserves in below ground structures that can sustain the plant (Kilminster et al. 2015). While seemingly being able to withstand extended periods of low light during the wet season, the losses of *E. acoroides* that occurred in 2015 and 2016 between Evans Landing and Lorim Point, when there were additional uncharacteristic localised reductions in light during the dry season, show that the species can be vulnerable. Particularly when there are multiple occurrences of sustained low light within a year. It is likely that *E. acoroides* is relying on

the generally good light conditions that typically occur in the dry season to recover their energy reserves and resilience each year. While plants appeared to be healthy in May 2019 it is not clear if these energy stores were more depleted due to the increased severity of the wet season low light conditions.

While in Weipa seagrasses appear to have coped well with wet season conditions in 2018/19 other areas of the Gulf of Carpentaria may not have fared so well. To the south in Karumba seagrasses were impacted by TC Nora and the flooding associated with the cyclone between March and April 2018 (Van De Wetering et al. 2019) and for the first time in fifteen years seagrass condition declined. Additional flooding associated with 2018/19 wet season events may have placed further pressure on these seagrasses.

The persistent occurrence of seagrass in the Port of Weipa is a reflection of the resilience of seagrasses in the region to periodic low light, tidal exposure and 'typical' port activities such as maintenance dredging. While generally resilient, previous localised declines of some meadows, and large losses of seagrasses in nearby regions in response to weather events illustrate the potential of this resilience to be eroded. While current conditions indicate seagrasses were in a healthy state we would recommend that where possible the interactions between maintenance dredging plumes and seagrass meadows be minimised to ensure their continued health, particularly as the campaign runs through the start of the dry season when seagrasses are likely to be replenishing their reserves following the wet season.

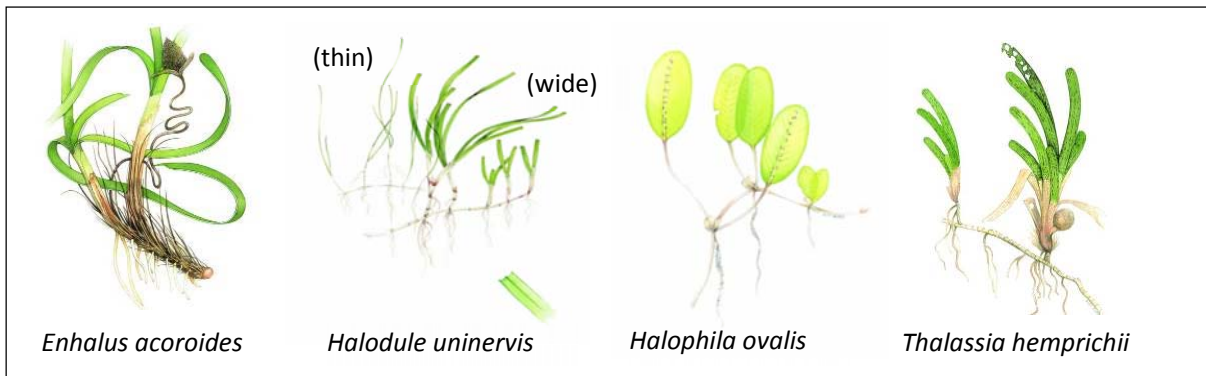


Figure 3. Seagrass species present in the May 2019 survey.

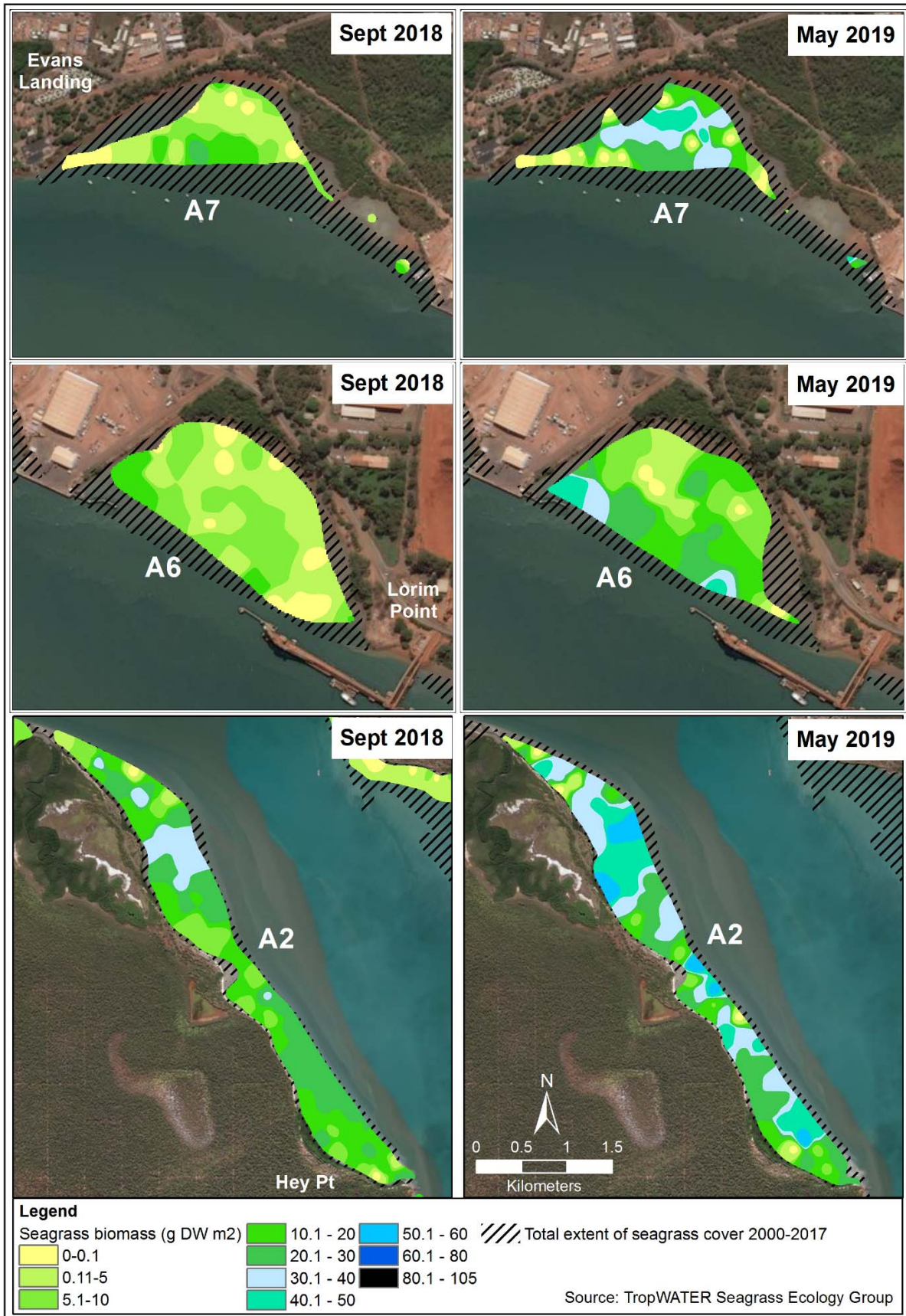


Figure 4. Seagrass meadow density and distribution of the three core monitoring meadows surveyed in May 2019.

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