Seagrass Monitoring Laman Bay, Epi Island

The Vanuatu Environmental Science Society (VESS) have continued with the Seagrass Monitoring Program in important coastal areas for dugongs around Vanuatu. This program is in partnership with the Vanuatu Department of Fisheries and the Department of Environmental Protection and Conservation. VESS continues to build on its baseline data which investigates the condition of seagrass and measures, over time, any changes in the health of seagrass meadows. This baseline can be use for comparison in future years. The aim of this report is to inform communities of the findings of these surveys, which can be used to inform the management and protection seagrass in these local areas.

Laman Bay on Epi Island, was chosen as a monitoring site as it has a seagrass meadow with many animals that rely on it for food and shelter, including dugongs, green turtles, juvenile fish, and many other small animals. VESS has chosen the two sites, EP1 and EP2 within the bay (Figure 1), and we will continue to monitor annually. Over time, we will detect any changes in the health of the seagrass. Variations are expected within the year due to different growing seasons, but we are looking for any changes over the years.

Figure 1: The Laman Bay sites named EP1 and EP2 shown on a Google image of the coast in Epi.

Method

At each site we go to the same location using a GPS to find it. Then we set up three 50m measuring tapes in parallel, 25m apart. These lines are called transects (Figure 2). Every 5m along the transects, we put a 50cm x 50cm square (quadrat) and look at the seagrass inside the square. There is a total of 33 quadrats for each monitoring event at each site. We combine the information from all the quadrats together to get an average of the health of the seagrass across the whole site.

For each quadrat, we record the following;

- Percentage of seagrass cover;
- Average height of grass leaves;
- Different species of seagrass;
- Percentage of epiphyte cover (algae living on the seagrass leaves);
- Sediment type e.g., sand, mud, shells;
- Anything else we find of interest such as how many snails are inside the area, or if there are feeding trails from dugongs; and
- Photos are taken at each quadrat as a back-up record and for quality assurance.

Figure 2: A quadrat next to the transect line. We collect data from inside the quadrat every 5m.

The data and photos are sent to Seagrass-Watch Head Quarters and is added to the international dataset after going through quality control and quality assurance process.

Results

VESS has identified five different species of seagrass in Laman Bay (Figure 3). Four out of the five species have thin, strap-like leaves but they can also be identified by some special features, and the other has noodle-like leaves. *Thalassia hemprichii* and *Halodule uninervis* were most abundant during the 2018 and 2019 monitoring periods and *Thalassia hemprichii* and *Cymodocea rotundata* were most prevalent during the 2020 monitoring event. *Enhalus acoroides* and *Syringodium isoetifolium* were recorded only during the September 2018 monitoring period (Figure 4).

Enhalus acoroides Significantly bigger than other species in Erakor with strong roots.	*Thalassia hemprichii* Wide curvy leaf with rounded end.	*Cymodocea rotundata* Narrow leaf with rounded leaf tips.	*Halodule uninervis* Three tips on the leaf tip and one vein down the middle of the leaf.	*Syringodium isoetifolium* Narrow leaves like noodles with a point at the end

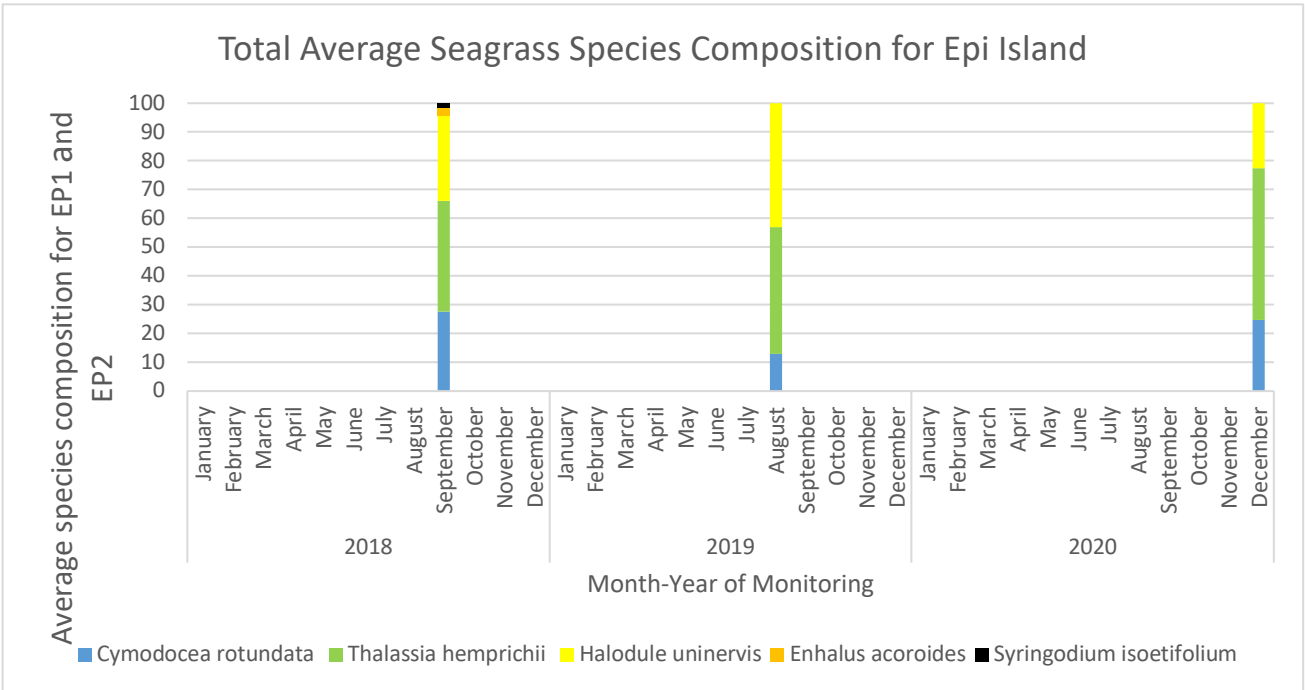

Figure 4: Total average of the main seagrass species recorded at Laman Bay across years 2018-2020.

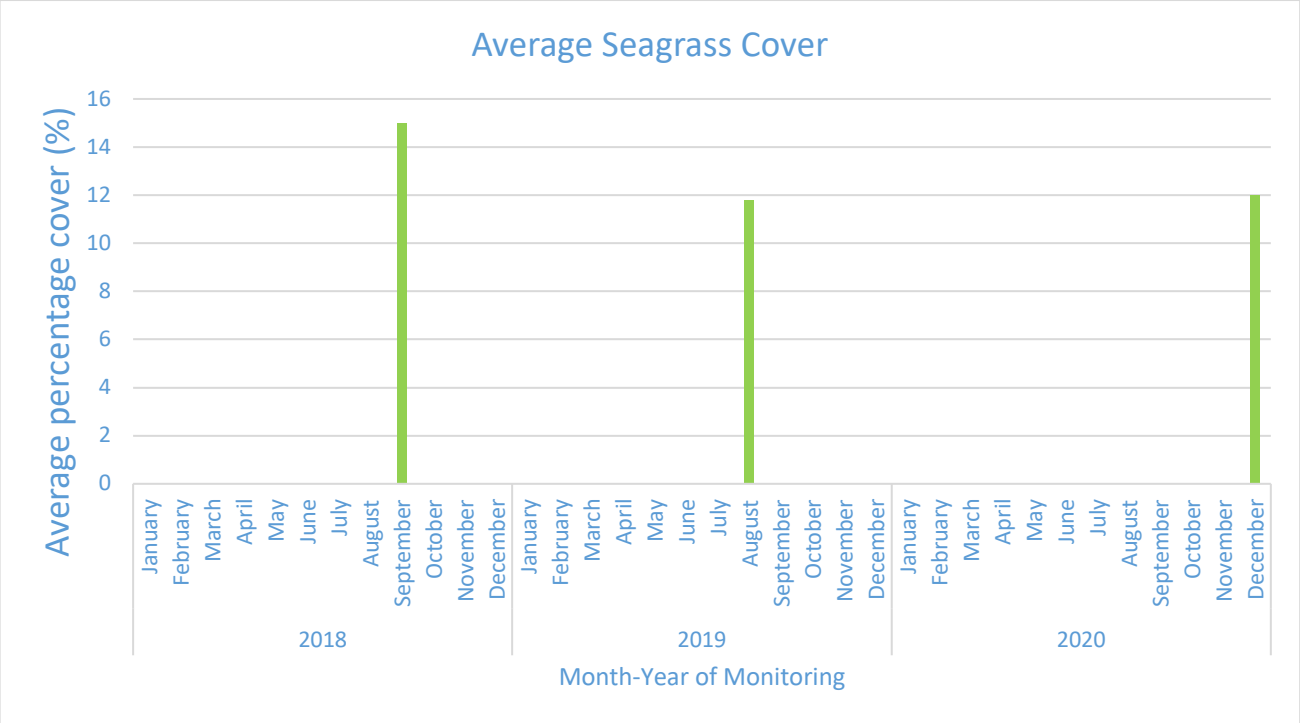

Figure 5: Average seagrass cover at Laman Bay over the years 2018-2020 shows seasonal variations but no major changes.

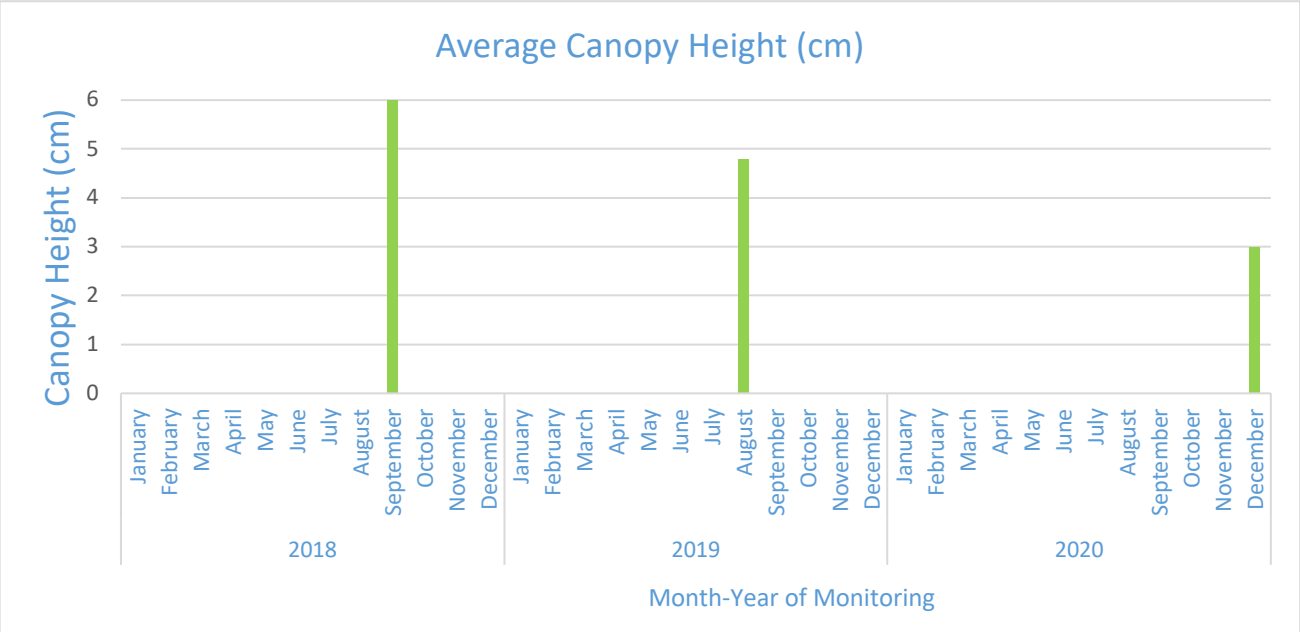

Figure 6: Average canopy height at Laman Bay over the years 2018-2020 shows seasonal variations but no significant changes to the canopy height.

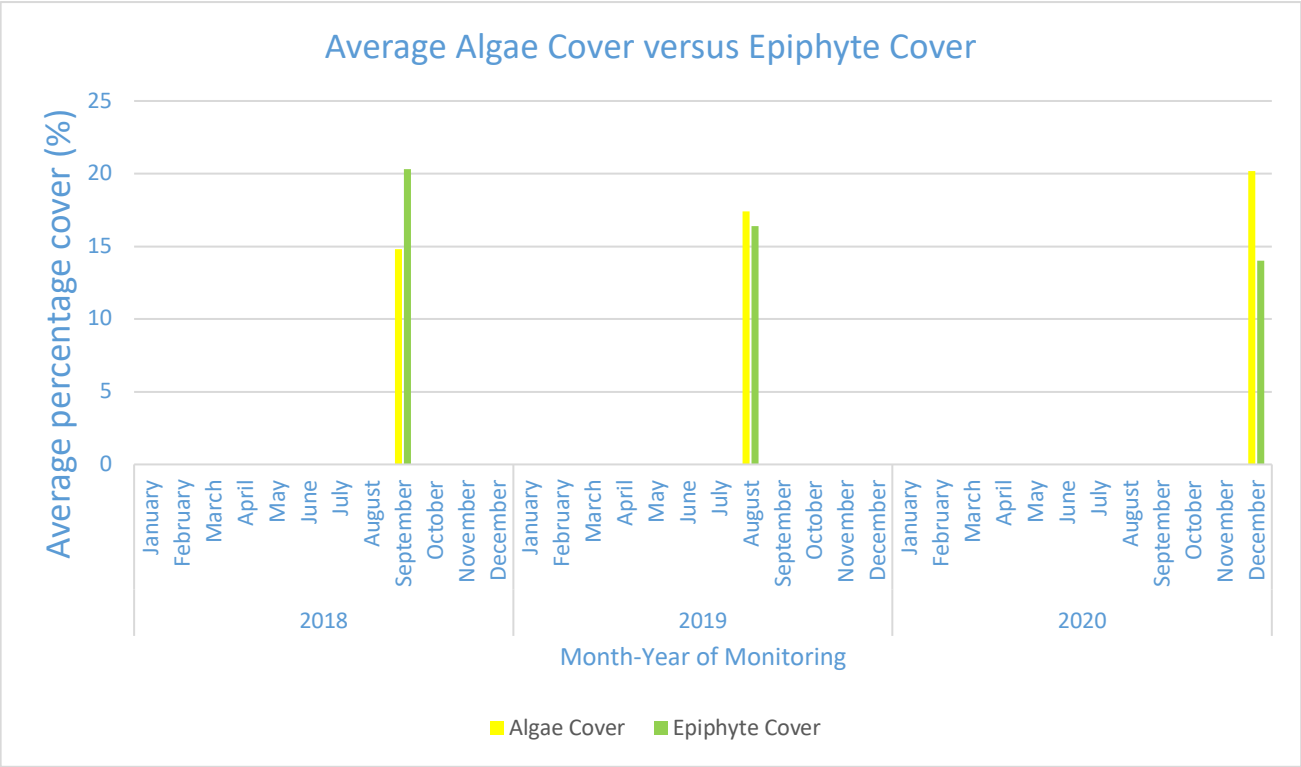

Figure 7: Average algae cover (algae not living on seagrass leaves) and epiphyte cover (algae living on seagrass leaves) at Laman Bay over the years 2018-2020. Generally, results are stable.

There are natural changes in the seagrass meadows during the year, as the weather changes. Seagrass height and cover tends to be higher in the warmer months with longer sunshine hours. Algae, (both on the leaves and not living on the seagrass), tends to be greater when there is more nutrient in the water as well as when the water is warmer. But the algae levels can be affected by the number of snails or other animals that feed on the algae too.

VESS started monitoring seagrass in Laman Bay in 2018, and since then we have survey data for three monitoring events (September 2018 to December 2020). The results are shown in the graphs (Figure 5, Figure 6 and Figure 7). We can see that there are small variations from year to year and may be due to monitoring in different months of the year. However, the variation is small and seagrass meadows appear to be stable. It is important to continue monitoring so we can see if there are any changes over a longer period of time.

VESS will continue to update the community on the results of our monitoring to help with management of coastal areas and conservation actions that may be needed. We thank the Laman Bay community for allowing VESS to continue with the monitoring program and hope to continue working together to monitor this important ecosystem and protect the marine life that depends on it.