Seagrass Monitoring Poanangisu

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.

Poanangisu was chosen as a monitoring site as it has a large 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, EF3 and EF4 within the lagoon (Figure 1), and we have monitored the condition of the seagrass multiple times a year for the last four years, 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 Poanangisu sites named EF3 and EF4 shown on a Google image of the coast of North Efate.

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 six different species of seagrass in the Poanangisu sites (Figure 3). Four out of the six species have thin, strap-like leaves but they can also be identified by some special features. One has small oval leaves, and another has noodle-like leaves. Out of the six, *Thalassia hemprichii* and *Cymodocea rotundata* are found the most throughout the meadow (Figure 4).

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

Figure 3: Six different seagrass species have been recorded in Poanangisu *(source of images: http://www.seagrasswatch.org/id_seagrass.html*

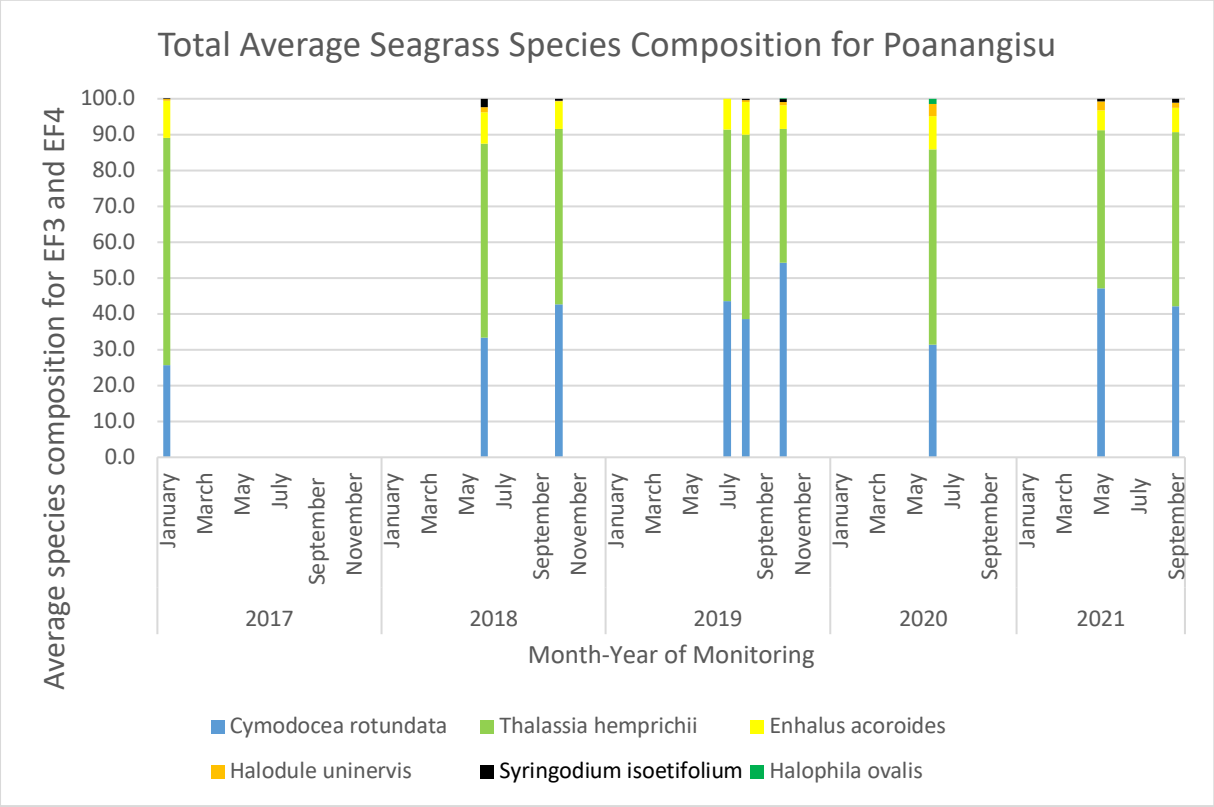

Figure 4: Total average of the main seagrass species recorded at Poanangisu across years 2017-2020.

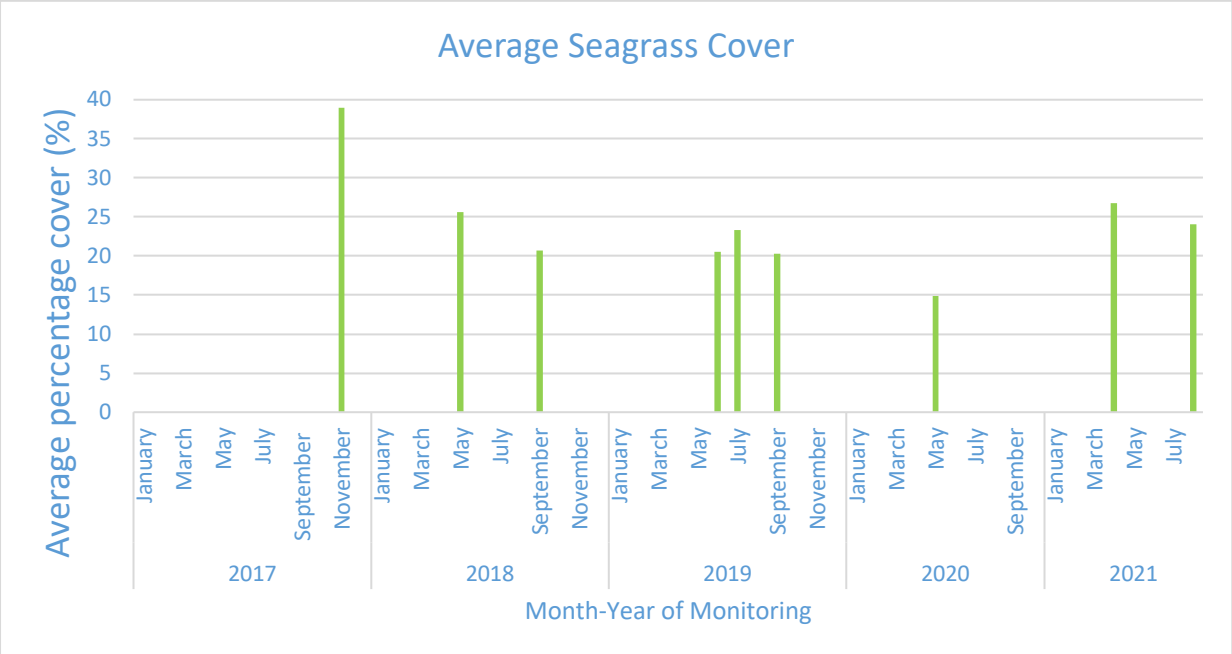

Figure 5: Average seagrass cover at Poanangisu over the years 2017-2021 shows seasonal variations but no major changes.

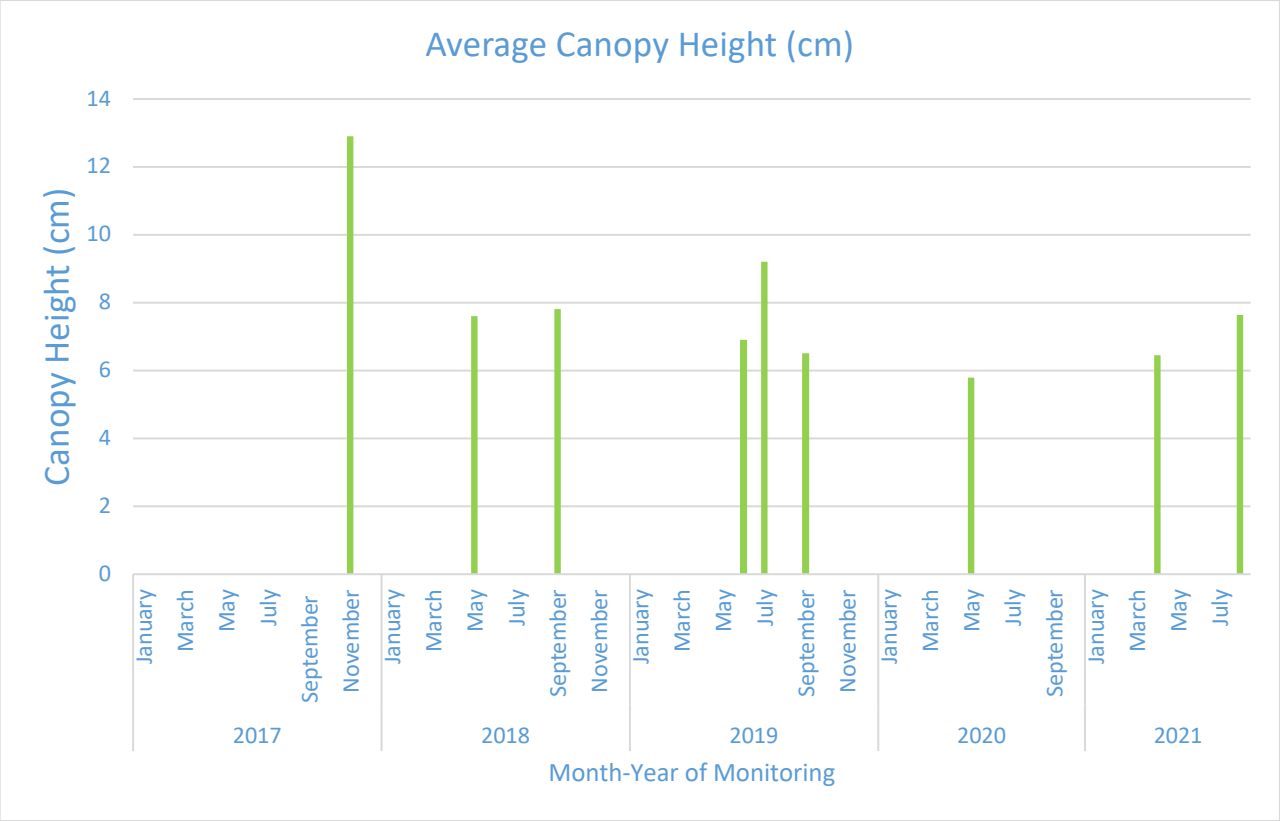

Figure 6: Average canopy height at Poanangisu over the years 2017-2021 shows seasonal variations but no significant changes to the canopy height.

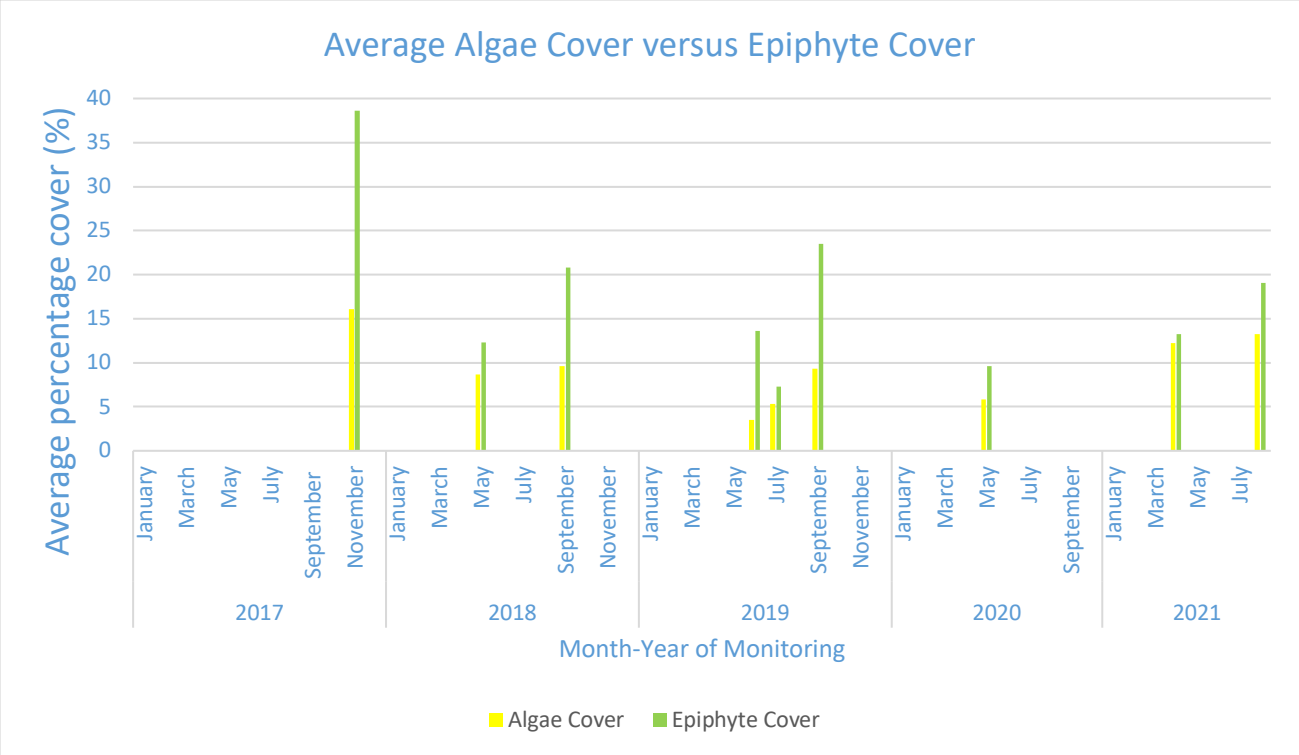

Figure 7: Average algae cover (algae not living on seagrass leaves) and epiphyte cover (algae living on seagrass leaves) at Poanangisu over the years 2017-2021. Generally, results are generally stable.

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 at Poanangisu in 2017, and since then we have survey data for nine monitoring events (December 2017 to September 2021). The results are shown in the graphs (Figure 5, Figure 6 and Figure 7). We can see that there are some variations with the different times of the year, as expected. However, the seagrass meadows appear to be stable when we look at the data across the years. 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 Poanangisu 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.