2020 SMALL GRANT IN AID OF RESEARCH - FINAL SUMMARY REPORT

Project title: Assessing the impact of Giant Salvinia proliferation on the habitat use of the African manatee in Lake Ossa, Cameroon, and determining the most efficient manatee detection method

By Clinton Factheu[1,3]

Collaborators:

Athena Rycyck[2], Aristide Kamla[3], Mumi Kikuchi[4], Sevilor Kekeunou[1], Lucy Keith-Dagne[5]

[1]University of Yaoundé 1, BP 812, Yaoundé, Cameroon; [2] New College of Florida, Florida, USA; [3]African Marine Mammal Conservation Orgnization, Dizangue-Edea, Cameroon; [4]Japan manatee education and study lab, Japan; [5]African Aquatic Conservation Fund, Ngazobil, Senegal

Abstract

Lake Ossa, known as a manatee sanctuary in Cameroon, is being invaded by Giant Salvinia, an aquatic fern which has covered over 50% of the lake's surface and has the potential to outcompete the manatee's main food source, antelope grass. This may influence how manatees are distributed in Lake Ossa. In this study, we did the very first year-round passive acoustic monitoring of the African manatee to: 1) Determine and compare manatee occurrence frequencies in invaded and non-invaded areas of Lake Ossa; 2) determine if there is a correlation between Giant Salvinia density and manatee occurrence frequencies; 3) determine and compare manatees' temporal occurrence patterns in salvinia-invaded sites vs non-invaded sites of Lake Ossa; 4) determine the most efficient manatee detection method. From November 2020 to October 2021, we did monthly 2-day hydrophone deployments at six sites of Lake Ossa (three sites in the invaded and three in the non-invaded area) and did monthly one-hour scans at 10 sites (5 invaded and 5 non-invaded) using simultaneously point-scan, 360 sonar scan and passive acoustics. Salvinia density (Kg/m^2) was measured prior to each hydrophone deployment and manatee scans. Acoustic recordings were audited to detect manatees through their vocalizations and chewing sounds. From the 2-day hydrophone deployment data, manatees occurred more in the non-invaded area of Lake Ossa (84.72%, N=72) than in the invaded area (10%, N=70), with a negative statistically significant correlation between Salvinia density and manatee occurrence frequency (r = -0.66, p-value = 2.98e-10). The lowest occurrence frequency was recorded between 21h-22h and 01h-04h (0%, invaded area) and 19h-20h (15.28%, non-invaded area) whereas the highest was between 12h-13h (7.14%, invaded

area) and 04h-05h (44.4%, non-invaded area). Passive acoustics appeared to be more efficient in detecting the African manatee in Lake Ossa ($P = 0.24$, $N = 120$) than Sonar scan ($P = 0.12$, $N = 120$) and point-scan ($P = 0.03$, $N = 120$). These results reveal that Giant Salvinia negatively influence manatee distribution in Lake Ossa and that passive acoustics appears to be more efficient in detecting this cryptic species. Results of this project will inform manatee conservation actions in Lake Ossa and orient manatee monitoring methodology in the region.

We plan to publish two papers from this project by December 2020.