

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Veronica Valverde Cantillo
<b>Project Title</b>	Hawksbill turtles and where to find them: identifying key habitats for conservation in the north Pacific of Costa Rica
<b>Application ID</b>	35532-1
<b>Date of this Report</b>	June 20th, 2023

**1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.**

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Identify critical habitats of Hawksbill turtles to understand spatial ecology of the species				The initial areas monitored showed the turtles are not using them much. However, this data has pointed us into new directions for monitoring areas in the future.
Create a map of key habitats for hawksbill turtles in the study region				We were able to successfully monitor five sites around the gulf, however all these are "low use" areas. To create a complete map of the key habitats, we are still to find the areas they are using more.
Support local communities to develop ecotourism experiences around sea turtle knowledge				We were able to consult with local tour operators and community-based NGOs to select sites and do the monitoring activities at each site. In these trips, we sometimes included tourists, students, and volunteers. A more complete set up of our results still needs to be built to share with more people in the community, however they are already benefitting from workshops and knowledge sharing.

**2. Describe the three most important outcomes of your project.**

**a).** Growth of local acoustic monitoring network: Through the collaboration with donors and other acoustic telemetry projects we have been able increase our monitoring area and acoustic telemetry array. Currently we are monitoring the main area (Matapalito bay) with six acoustic receivers and the nearby bay (Santa Elena Bay) with 13 acoustic receivers. We are also monitoring five additional sites with coral reefs, rocky reefs, mangrove areas and rock outcrops, with one receiver each to detect general use of each of these, covering in total around 20 km of coastline.

**b).** Identified areas far away from the initial identified feeding habitat that the same individuals are using: Although we have not found high use habitats outside of Matapalito bay, we have found some individuals moving up to 8 km from the initial tagging site for brief periods of time. This opens more questions as to how far the turtles move in the different directions and what different habitats, they might be using in each place they visit, what drives these movements and how long they spend in each.

**c).** Initiate training for local tour operators in citizen science related to sea turtle handling and identification: We developed the first workshop on sea turtle handling. This was the first time tour operators received training in this topic and motivated them toward receiving more information about sea turtles and participating in more related activities.

Generating new information on the area sea turtles are using outside of current protected areas. Since the initial studies showed that Matapalito bay was a key area for sea turtle feeding, we have found that this is a low use area for hawksbill turtles, that they use other habitats like mangroves, and that they are not moving (or not being detected) in bays towards the inner region of the Gulf of Santa Elena. This opens new questions and points toward monitoring outer region of the Gulf of Santa Elena, which has very different ecosystems to the inner portion.

### **3. Explain any unforeseen difficulties that arose during the project and how these were tackled.**

The main challenge faced was that the data obtained by the first trials of the acoustic receiver set up where not as expected. Given that the previous information on the areas the hawksbill turtles were using was restricted to Matapalito bay, we set up the new acoustic receiver in other nearby bay to get detections of which were the turtles using. However, after a couple of months of monitoring the other bay, we did not get many (if any) detections. We considered the possibility that the turtles could still use this bay but during another season and moving the receiver to another region as initially planned, we could be making wrong assumptions about the use of the turtles. To tackle this challenge, we decided to leave the receiver in the same site to see if there could be a seasonality in the times the turtles visited it and focus more effort in securing other receivers that would allow us to monitor more areas simultaneously. We were able to secure four receivers apart from the one obtained through this grant and monitor four bays and one island simultaneously.

Another challenge faced was the role citizen scientists could play in the data collection. Because the identification of sea turtles from boats can be unprecise to a species level, we decided to first do some monitoring with the acoustic telemetry to set a base and then create a following phase with citizen scientist involvement. This second phase consists of workshops to train citizen scientists to collect sea turtle data. We have already started this with one workshop in April 2023 and a second workshop in June 2023.

### **4. Describe the involvement of local communities and how they have benefited from the project.**

The knowledge of the local communities has been crucial when deciding which places to monitor as the acoustic receiver array grew. We have picked three bays with important coral reef patches, one bay with rocky reef and sandy environments and one islet with rocky reef habitats. These places were picked strategically by personal comments of a community based sea turtle conservation NGO and local tour operators that have shown initial interest in the project on where they had seen

more turtles (especially if they had photographs of turtles in these sites) and of where they had seen healthy ecosystems matching to the turtle's requirements (healthy coral reefs, rich rocky reefs, protected areas for resting).

The community has benefitted from this project in different ways. First, the community-based NGO has benefited from the monitoring trips financed by the project. Since we received the Rufford Small Grant, we have had eight monitoring trips to the main foraging site. This involved hiring local boats and hiring local conservationists to help with sea turtle capturing, as well as hiring local women owned businesses for food services. Also, the receiver deployment and data downloads (about five trips) were conducted with local tour operators involved in citizen science and research.

During this period, there was also one workshop on best practices for sea turtle handling and release. This was conducted under a workshop programme created by the organisations SUBMON, Ecopacific+ and local government for fishers, and adapted for tour operators. The workshop was open to members of a local citizen science group called CCMar and a total of 19 people participated. A second workshop was completed in June 2023 on sea turtle identification conducted under a local Ocean's Day Festival and was open to ecotourism students from the National Institute of Learning and other tour guides. We had participation of 10 people.

#### **5. Are there any plans to continue this work?**

Yes, given that the data still has not shown where sea turtles go when they leave the main foraging area (Matapalito bay), we believe that it is important to continue this study. This could include expanding more the acoustic telemetry array, as well as using other telemetry technologies.

#### **6. How do you plan to share the results of your work with others?**

We plan to share our results through talks at the university and at meetings with local communities, during scientific reunions such as the International Sea Turtle Symposium or local conferences, and through peer-reviewed papers once we have complete analysis.

#### **7. Looking ahead, what do you feel are the important next steps?**

Future steps will focus on evaluating if the current monitoring sites should continue being monitored by acoustic receivers or if some stations should be changed, securing a few more receivers to monitor other areas, tagging sea turtles captured in different sites, and considering using other monitoring methods. Also important, future activities should include more participation of citizen scientists to monitor sea turtle population, as well as giving them more training for sea turtle ecotourism.

**8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?**

Yes, we used the logo in several presentations. It was shown as one of the main contributors of this project. We also included the logo in posters created for sharing of the project both physically and in social media.

**9. Provide a full list of all the members of your team and their role in the project.**

**Veronica Valverde-Cantillo:** Project leader. Field trio coordinator.

**Mario Espinoza:** Advisor on acoustic telemetry set up and preliminary result interpretation.

**Mike Heidemeyer:** Advisor on sea turtle monitoring and capture and preliminary result interpretation.

**Chris Lowe:** Advisor on preliminary result interpretation.

**Frank Paladino:** Advisor on sea turtle biology and preliminary result interpretation.

**Anibal Lara:** Sea turtle capturing.

Equipo Tora Carey (**Marlon Mora, Randall Mora, Mathilde Giry**): Sea turtle capturing.

Diving Center Cuajiniquil (**Minor Lara, Minor Lara, Steven Lara**): Acoustic receiver deployment and recovery.

**10. Any other comments?**