CITIZEN SCIENCE TO THE RESCUE OF THE SEA TURTLE NESTING POPULATION OF HERMOSA BEACH, UVITA DE OSA, PUNTARENAS, COSTA RICA

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INTRODUCTION

Hermosa Beach is a sea turtle nesting site located in the South Pacific coast of Costa Rica, although it borders to the south with the Marino Ballena National Park, this area is not under any protection category of the state.

Before the year 2020 no formal research was conducted on this beach. For that reason, Reserva Playa Tortuga had the plan to establish a sea turtle nesting monitoring program on Hermosa Beach, but the pandemic of SARS-CoV-2 affected sea turtle conservation programs worldwide, with a lack of international volunteers and funding, resulting in their operation being difficult or impossible to continue.

In the midst of the pandemic, our region experienced an influx of individuals from North America and Europe interested in the country's nature and conservation efforts. By identifying that opportunity, Reserva Playa Tortuga organized an open community meeting to encourage Costa Ricans and expats (foreigners living in Costa Rica) to become volunteers of the Hermosa Beach sea turtle's conservation program.

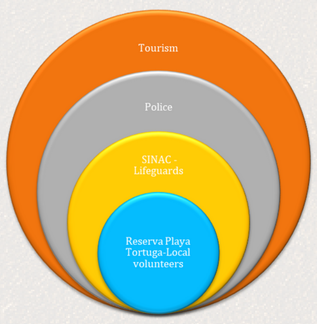
In July 2020, Reserva Playa Tortuga created the first group of local volunteers, integrated by community members, lifeguards, and psrk rangers. The aim of this study is to show how many different actors can work together to reach the same goal, and how the researchers became a guide to teach and empower the community to protect the nesting sea turtles sites such as Hermosa Beach.

Figure 1. Local volunteers and reserchers after preparing the hatchery for the new season.

METHODS

The Hermosa Beach sea turtle monitoring first season started in June 2020 and finished in December 2020(Figure 3)

During June 2020, Reserva Playa Tortuga staff performed two exploratory morning censuses at Hermosa Beach to get evidence of the nesting potential of the site. The survey counted a total of 25 olive ridley tracks. From the turtle tracks, 13 were nests and all nest were poached.



Level	Actors
1. Direct interaction	**Reserva Playa Tortuga (RPT):** Scientific advisor, in charge of the research permits, participants' training, and project coordination. **Local volunteers:** Community members, in charge of the beach census, data recording, nest detection, and transportation to the RPT hatchery.
2. Middle interaction (their support depended on a previous solicitude)	**National System of Conservation Areas (SINAC):** In charge of approving and supervising the actions related to the research permit, support in terms of protection and control, security on the beach depending on staff availability.
3. Weak interaction (participating only in specific activities)	**Police:** support in terms of security of the beach monitoring team when required.
4. Very weak interaction (participating only in sporadic activities)	**Tourism:** Tourists participated by joining the turtles' releases under Local volunteers and RPT staff supervision.

Figure 2. Actors identified and their level of interaction with the Sea Turtles conservation monitoring on Hermosa Beach. Smaller circles represent a closer interaction.

Due to the difficulty for the organization to manage the beach due to the lack of staff, at the end of June, the Reserva developed a mapping of potential actors, doing an analysis of the level of interaction of the groups and the management element "nesting beach" in this case Hermosa Beach, based on the methodology of the Guide to Elaborate, Plans of control, prevention, and protection (SINAC 2017). Once the potential actors were identified, meetings and workshops were coordinated in search of collaboration for the project (Figure 2).

For the beach monitoring, the local volunteers were organized in groups of a minimum of three people per day and the beach was monitored by each team, every morning starting at 4:00 am. In the first month, the Reserva Playa Tortuga research biologist joined every walk to teach the scientific protocol in the field.

Figure 3. Hermosa Beach Sea Turtle conservation project timeline 2020

RESULTS

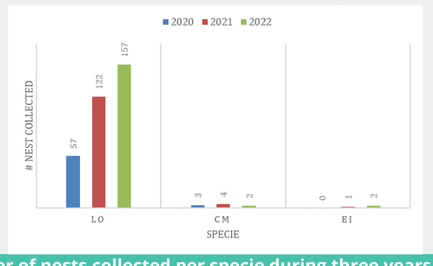
After meeting the main actors identified, the Hermosa Beach sea turtles project obtained the commitment of the Marino Ballena National Park administration to collaborate with the Reserva Playa Tortuga in terms of control and security operations on the beach.

The lifeguards from Hermosa Beach agreed to cover the southern middle section of the beach (around 1.2 km), this happened at 5 am during the very first two-months of the monitoring. After this period, the lifeguards helped the local volunteers when they had problems finding a nest.

The community meeting brought a total of 40 people interested in joining the organization as local volunteers to monitor Hermosa Beach.

As a result of the first season monitoring at Hermosa Beach from July 15th, 2020, to December 30th, 2020, a total of ninety-seven nesting events were recorded; seventy-seven were from Lepidochelys olivacea (Olive ridley) and ten were from the Chelonia mydas (Green/black). A total of Fifty-seven of nests of the Olive ridley sea turtles and three from green/black sea turtles were collected and moved to the hatchery at Reserva Playa Tortuga.

By the end of the 2020-2021 season, a total of 3,901 hatchlings of L. olivacea and 217 of C. mydas were released, resulting in 86% and 95% of recruitment success for each of the species respectively. The season 2021-2022 began on June 1st of 2021 and finished on December 30th of 2021, a total of 122 nests from olive ridley sea turtles and four nests from green sea turtles, plus one nest of Eretmochelys imbricata (Hawksbill sea turtle) were collected. The figure (grafico de barras). includes the number of nest collected during the years 2021-2022 and 2022-2023, those seasons started one month earlier than the 2020 monitoring period and ended on December 30theach year.



Graphic 1. Number of nests collected per specie during three years at Hermosa beach, the beach monitoring in the season 2020 started one month later than in 2021 and 2022.

CONCLUSIONS

In terms of challenges for the project, the situation with the pandemic as the limitations to drive in certain hours, made the logistics complicated during 2020, and the increase of local people unemployed, made them look for other income alternatives (turtle eggs). The insecurity on the beach since the police and rangers had other priorities at this time, made the teams work only early in the mornings affecting the number of nests collected and actions including the ability to tag turtles.

The monitoring was a learning process because of the little knowledge about the nesting behavior, and species present at Hermosa Beach. However, in terms of opportunities, everything that was generated during the first season was new information for the nesting site.

A project of this nature requires dedication from the professional staff in order to keep the participants interested and well-trained in terms of fieldwork methodologies. In addition, the biologists must offer constant advice for frustration management due to poached nests and concerns with safety in regards to interaction with poachers.

Thanks to the monitoring effort conducted by the local volunteers during 2020-2021, the poachers reduced their activity in the mornings, opening the possibility of rescuing more nests in the next seasons.

In addition, the site was reconfirmed by the Sea Turtles Costa Rican authorities as an Olive Ridley nesting area, and it was possible to report the first official nesting event of a Pacific Green turtle and a Hawksbill for Hermosa Beach.

The commitment of some of the participants to the beach monitoring, allowed the project to have a base group of local volunteers with more experience capable of training the new volunteers for the next seasons.

By adding more volunteers every season, the possibility of increasing the monitoring effort to collect more nests, tag turtles and reduce the human impact, seems to be viable in a short term.

Finally, this work shows the importance of the community and other actors in the sea turtles' conservation and the role of modern researchers, in guiding people and empowering them in protecting their natural resources.

Figure 4. Local volunteers finding a nest.

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