

## **Project Update: June 2021**

March-April 2021

### **Introduction**

The COVID-19 pandemic brought unpredictable changes for the project. All fieldtrips were cancelled from March 2020 until February 2021. Given this situation, we were forced to change some of the activities we proposed at first, restructuring our methodology to the new conditions we are facing. Currently, the Galapagos National Park Authorities and the Galapagos Science Center have developed bio protocols for working safely at the field. Since March 2021, research activities at the Galapagos have slowly restarted.

### **Activities**

At first, we proposed two activities at two different sites: a capture-mark-recapture (CMR) study for estimating population of the neonate and juvenile blacktip sharks, and an evaluation of physiological stress and short-term mortality of neonates and juveniles related to by-catch fishing, at Puerto Grande and La Seca, the main potential nursery grounds at the island.

Restrictions for visiting sites around the island, as well as the limited number of people allowed at the boat, have limited our first proposed activity. Given restrictions, we have decided to focus on executing just the physiological stress and short-term mortality study at Puerto Grande during March (start of the pupping season), April (middle of the season), and May 2021 (end of pupping season).

This decision was taken because the CMR study implies capturing the largest number of sharks possible, consequently processing them rapidly to avoid mortality. This requires collaboration from the whole research team, especially during the start and middle of the pupping season, when, approximately, more than 30 individuals can be encountered per hour. People restrictions make it simply not possible to do it.

The new activity plan has been executed at Puerto Grande over 4 days in the field in March and April 2021 (May is still under process).

### **Preliminary Results**

Physiological and short-term mortality study

A total of 28 individuals were captured during March 2021 (start of the pupping season) and 29 during April 2021 (middle of the pupping season). We found smaller individuals at the start than at the middle of the pupping season, but not finding a significant difference (Figure 1). Female and males presented a sex ratio of 1:1, finding slightly more males than females (Figure 2).

According to preliminary results on physiological parameters, a total of 54 individuals were blood sampled. We found that individuals that spent more time caught in the net, presented higher values of lactate concentrations. Even though, further information is necessary to assess if there is a correlation in between these two variables, or if there are other ones that are interacting.

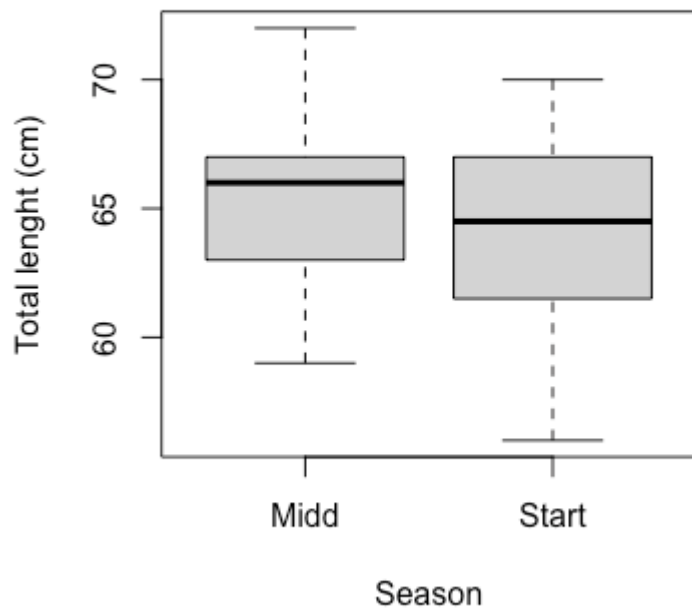


Figure 1: Total length of individuals caught during the start (March) and mid (April) of the pupping season at Puerto Grande.

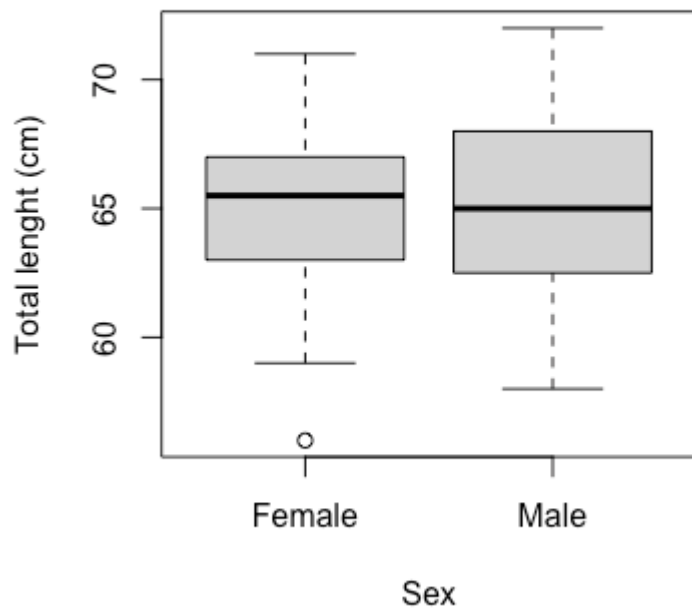


Figure 2: Total length from males and females found at Puerto Grande during sampled months.

A total of 57 sharks were assessed for reflexes. Approximately, 86% of sharks presented the bite reflex, and just 43% responded to the nictitating membrane stimulus. Flex and equilibrium were presented by 93% and 86%, respectively. Further data and information will help us to understand why nictating membrane is the less responded stimulus.

### **Observations**

During March 2021 fieldtrips we encountered 23 neonate scalloped hammerhead sharks. Further studies need to be done in order to assess stress status and short-term mortality given by-catch for this species catalogued by the IUCN as Critically Endangered.

### **Challenges**

1. Reheat problems with the haemoglobin field machine did not allow us to assess this parameter for all sharks. This was tackled by using a cooler to store the machine.
2. Because we will not be doing the CMR study, we will be adding drone surveys, as well as underwater baited drop cameras to keep registering abundance data inside Puerto Grande. We are still pending on additional funding for drone pilot.





TOP - Figure 3: A neonate blacktip released from the gillnet and ready to be processed aboard. ABOVE - Figure 4: The Shark Team working under COVID-19 bio-protocols at Puerto Grande.