

Leopard Whiptail Stingray

Patricia Soltan, Ryan Ho, Amy Portillo, Destiny Pina, Josh Wenzel, Raeven Caceres, Rohan Pandit

Background Information

- SPECIES: STINGRAY
- SIZE: UP TO 13 FT LONG
- DIET: SMALL FISHES
- LOCATION: PACIFIC OCEAN
- HABITAT: CLOSE TO SHORE
- COLOR & SHAPE
- INTERESTING FACT!!!!



5 Hypotheses

Article #1: The hypothesis of this experiment is to determine which of the two species in the *H. Leoparda* family should continue to hold the name based on spotting patterns, and determine the nucleotide synapomorphies in the partial COI gene sequence that distinguish species within the *H. uarnak* species complex

Article #2: A hypothesis could be that certain elasmobranch species may exhibit unusual resilience to the high levels of fishing pressure and environmental changes in the Bay of Bengal of Bangladesh.

Article #3: The hypothesis is there may be a change in the leopard ray species due to a combination of abiotic factors such as change in temperature, amount of sunlight, or salinity of water,

Article #4: The hypothesis states that increased freshwater runoff into estuaries would reduce the presence of sharks and rays.

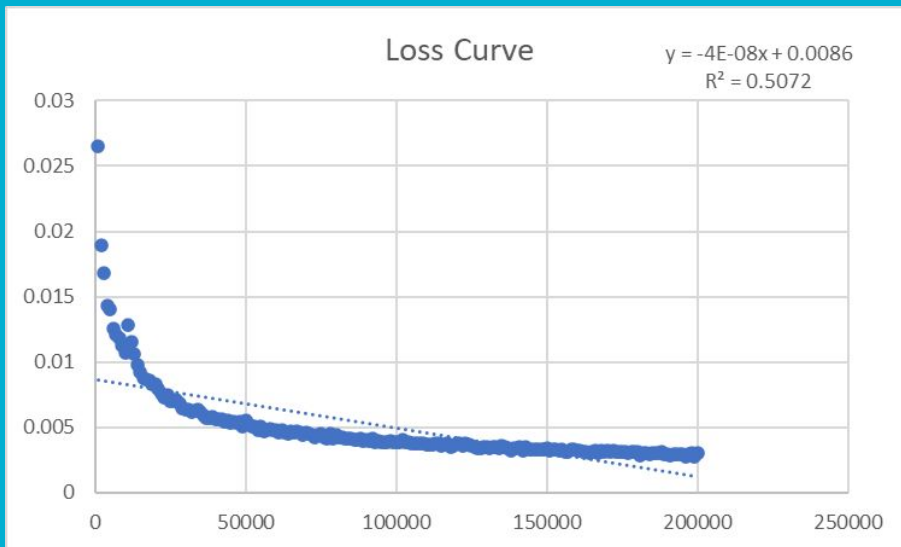
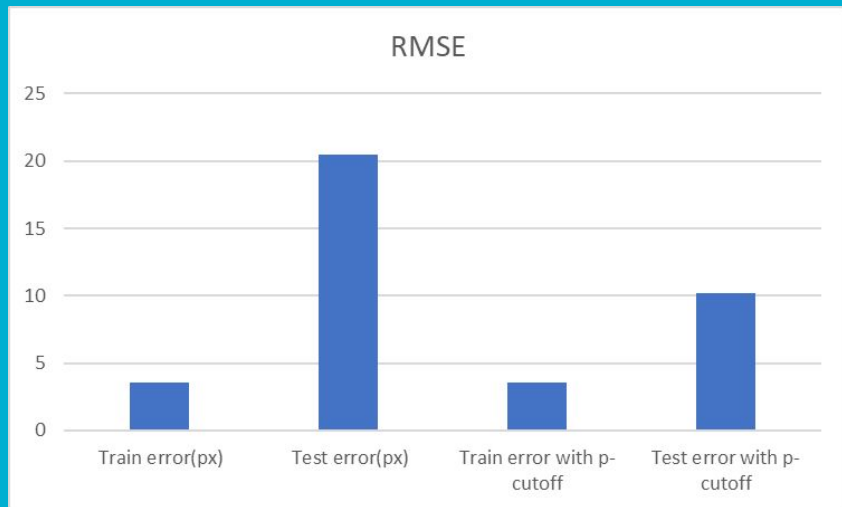
Article #5: using environmental DNA (eDNA) sampling and molecular biology methods can provide a comprehensive and up-to-date evaluation of the biodiversity of Class Chondrichthyes in the Banggai Archipelago however pollution may disrupt the accuracy of the evaluation thus a alternative and catch and release method.

Labeled Body Parts

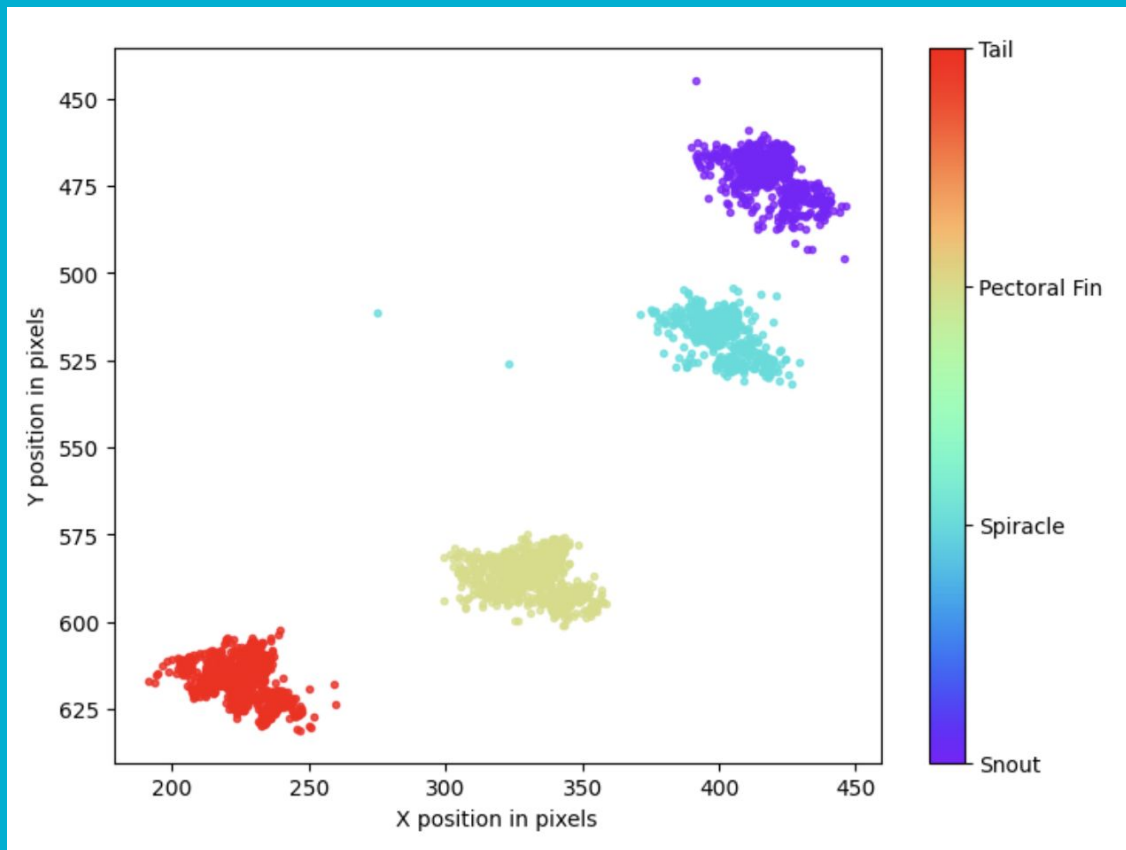
- Snout
- Spiracle
- Tail
- Pectoral fin



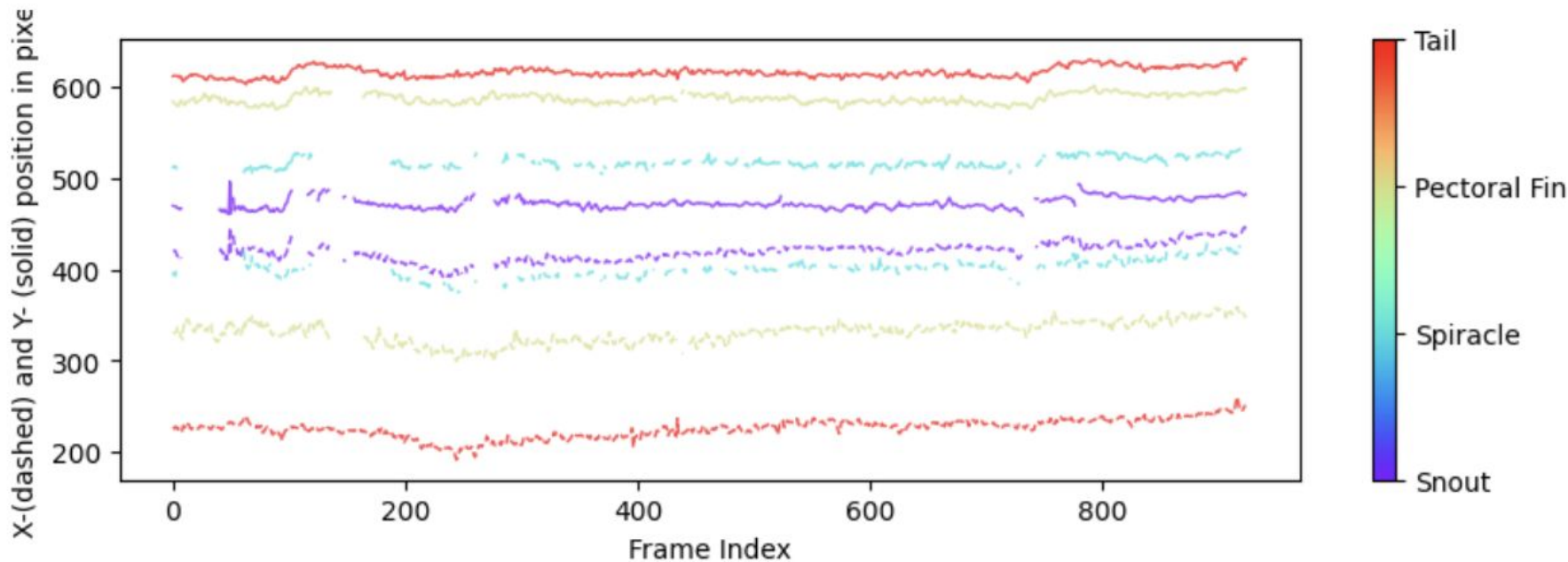
Loss Curve & Pixel Error



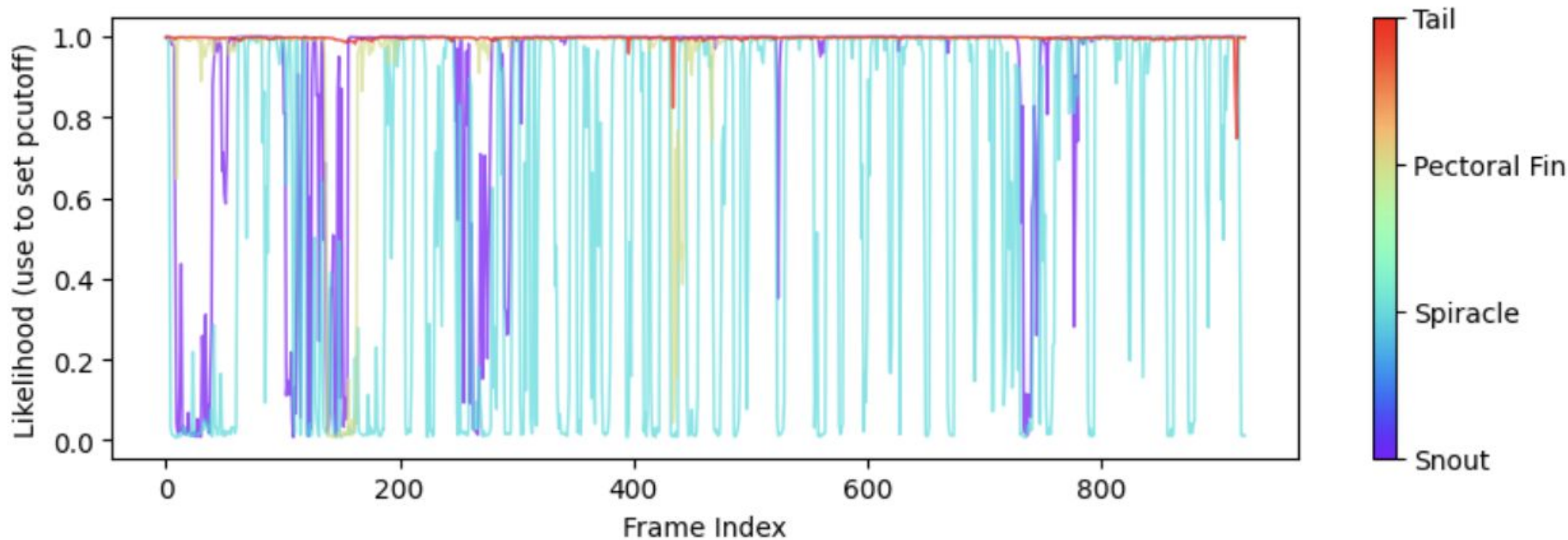
Body parts plotted in space



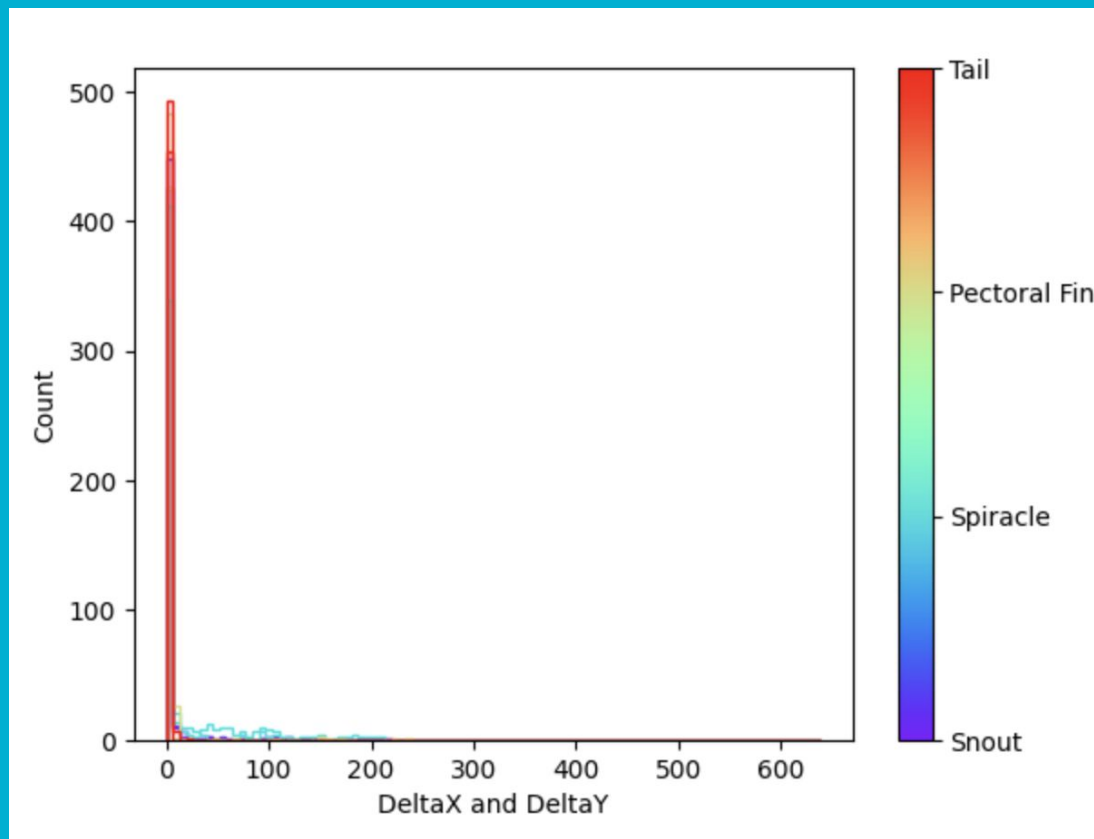
Body parts across time



Every body part likelihood over time



Consecutive differences



Labeled Video 2

—



Labeled Video 2



Hypothesis

A hypothesis could be that certain elasmobranch species may display unusual determination to the high levels of fishing pressure and environmental changes in the Bay of Bengal of Bangladesh.

Research design:

Sampling design:

First step is gathering information on elasmobranch diversity, species composition, catch and trade within Bangladesh

Data collection:

Data can be gathered once the sampling plan has been set using a variety of techniques.

Data analysis:

The information collected can be used to examine the species composition, capture, and trade.

Interpretation and communication of results:

The final step would involve interpreting the results of the data analysis and communicating the findings to stakeholders such as fishers, fishery managers, and policymakers.

Ethics on Research Design



When it comes to ethics, this might be the most important part of your experiment because this can give you the green light to continue and actually begin your project or the red light which will stop any progress. The three players that could possibly be affected are the players aka the rays, the water in which we are taking samples from, and our team as researchers. One of the biggest ethical guidelines is to always have minimal risk when it comes to any of the players. Minimal risk is any harm or discomfort that study participants may endure is not more severe than what they may encounter in their regular lives or during standard physical or psychological examinations. This also goes into making sure that the risk is absolutely the very lowest level of risk that could possibly happen while also going again with your study.

Ethics on Research Design pt.2



To start with the key players, the rays, we are not physically hurting them but we will gently mark and tag to keep track of them, therefore we could possibly be messing up their routine which might cause psychological problems as messing with a routine can cause instability. We will be getting our research through a multitude of things such as onboard observer programs, market survey, interviews with fishers in the area, and DNA barcoding of species samples. We plan to ask the fisherman at the specific port questions like what level of fishing pressure is there in the Bay of bengals and are there any cultural or economic factors that may influence the fishing pressure on elasmobranch populations in the Bay of Bengal? Observing is one of the safer ways to research without breaking ethical guidelines and that is one of the reasons why we will do it. After the observing and surveys/interviews, statistical techniques can be used to assess variations in species diversity and composition across different fishing grounds or seasons which will better reflect the truth.

Work cited

- Chin, A., & Kyne, P. M. (n.d.). *Effects of drought on avian community structure - wiley online library*. Global Change Library . Retrieved May 4, 2023, from <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2486.2009.02120.x>
- Borsa, P., & Durand, J. D. (2013, March 21). *Himantura Tutul sp. nov. (Myliobatoidei: Dasyatidae), a new ocellated whipray from the tropical indo-west pacific, described from its cytochrome-oxidase I gene sequence*. Comptes Rendus Biologies. Retrieved May 4, 2023, from <https://www.sciencedirect.com/science/article/pii/S163106911300005X>
- Haque, A. B., Cavanagh, R. D., & Seddon, N. (n.d.). *Evaluating artisanal fishing of globally threatened sharks and rays in the Bay of Bengal, Bangladesh*. PLOS ONE. Retrieved May 4, 2023, from <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0256146>
- *Leopard Whipray (Himantura Leoparda)*. iNaturalist. (n.d.). Retrieved May 2, 2023, from <https://www.inaturalist.org/taxa/188808-Himantura-leoparda>
- *Leopard Whipray*. Georgia Aquarium. (2022, November 16). Retrieved May 2, 2023, from <https://www.georgiaaquarium.org/animal/leopard-whipray/>
-
- Moore, A., & Jamaluddin, J. (n.d.). *Sharks and rays (Chondrichthyes) around Banggai - ProQuest*. ProQuest. Retrieved May 4, 2023, from <https://www.proquest.com/docview/2525730081?pq-origsite=gscholar&fromopenview=true>
- Vaudo, J. J., & Heithaus, M. R. (2013, April 12). *Microhabitat selection by Marine mesoconsumers in a thermally heterogeneous habitat: Behavioral thermoregulation or avoiding predation risk?* PLOS ONE. Retrieved May 4, 2023, from <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0061907>