Project Update: September 2019

Changes & updates that have been made to the project

Species Identification:
Based on images of juvenile guitarfish observed at the proposed study sites and improved identification guides (Last et al. 2016 & Jabado 2019) we have confirmed that all juvenile guitarfish observed to date are giant guitarfish (*Glaucostegus typus*) and not sharpnose guitarfish (*Glaucostegus granulatus*) as we had previously suspected. Both species are found in the region so it is not possible to definitively say that we will continue to find only a single species during the habitat surveys which will be conducted across the islands.

Study design:
In order to better understand the distribution of the guitarfish from across the Andaman Islands before focusing on a particular site, we have modified the study design to include a preliminary island wide survey to identify if there are any other sites that may also support high abundance of juvenile guitarfish. This approach will add a broader significance to the project and also provide us with a better comparison between sites. Details on how we plan to do this are listed below in the methodology and timeline section.

Over the last few years elasmobranch (shark and ray) fisheries research in the Andaman Islands has been gaining increasing attention from the research community, and currently there are a few researchers working on different aspects of elasmobranch fisheries. In order to avoid any overlap between projects we will be leave out the fisheries aspect of this study and instead only focus on the juvenile guitarfish and the habitats they depend on. However, we will collaborate with the other researchers when needed.

We had planned to use tagging and mark-recapture techniques to collect data on guitarfish population size, residency time, individual growth rate and movement patterns. But due to the shift in focus of the project and the task of acquiring the required permits we have decided to adopt a less invasive technique. This will mean losing out on some of the vital data we initially planned on collecting, but in place of which we will be broadening our scope and collecting data from across the Andaman Islands.

Commencement of field work and project time line:
Due to the late onset of the south-west monsoons and the changes to the study design I now plan on starting fieldwork and data collection by the 20th September 2019 (as opposed to the start date of August 2019 that was originally proposed). As a result of the island wide approach that we will be adopting, and budget constraints, it will not be possible to spend 10 months in the field collecting data as previously planned, instead it will be reduced to 6-7 months.

Workshops:
Due to the time constraints and lack of conclusive seasonal data to present, we will no longer be conducting workshops with stakeholders or communities. However, we do plan on following through with this in future projects once we have the results and findings to put forth.

Project Summary
This project aims to address the lack of critical information regarding the life history of giant guitarfish (*Glaucostegus* sp.) and their distribution in the waters surrounding the Andaman Islands. A preliminary occupancy survey of juvenile guitarfish from across the archipelagos will provide us with areas of high abundance of juvenile guitarfish which could in turn help identify critical habitats such as nursery grounds. By monitoring the site(s) identified over a period of time we will determine the factors that promote the use of these site(s) by the juveniles. The identification and protection of these crucial habitats are likely to have conservation implications for the species.

Project Activities
The fieldwork will be carried out over a period of 6 months and will include an island-wide exploratory survey of coastal habitats, followed by focused surveys at sites identified to support juvenile guitarfish aggregations.

The preliminary study will be carried out across the Andaman Islands to try and identify if there are particular sites where juvenile guitarfish aggregate. We have already identified specific areas along the coastline that have a seasonally higher abundance of juvenile guitarfish. These habitats are primarily shallow, sheltered sandy bottom coastal areas, most of which include vast seagrass beds. By surveying multiple coastal habitats across the islands we hope to identify particular habitat characteristics that may be promoting the use of particular sites as suitable nurseries.

Methodology & Timeline
The project has been divided into two phases based on the objectives and tasks planned out.

Phase I: Identify juvenile guitarfish aggregation sites from across the Andaman Islands.

Phase II: Monitor sites identified during Phase I over the course of the project duration (6 months) to collect data on the residency and relative abundance of juvenile guitarfish.

Phase I (Data compilation & interview based survey) – (1 month)
In order to identify as many potential aggregation sites from across the Andaman Islands I will be relying on observations made by individuals who live/work along the coastline. This will also involve reviewing data collected by other researchers working on the Islands in addition to conducting semi structured rapid interview surveys with fishers, coastal communities, and government employees (forest rangers, Navy/Coast Guard personnel) posted along coastal areas across the Andaman Islands to collect data on sightings of juvenile guitarfish along the coast. The interviews will be designed to collect data on the location of juvenile guitarfish sightings, abundance/number of animals sighted and any seasonality in the sightings. Once these data have been collected, they will be used to create an occupancy map of areas where juvenile guitarfish have been sighted most frequently and in highest numbers. After which I will visit each (based on accessibility and practicality) of these sites to confirm the presence, residency time, and relative abundance of the guitarfish using the methods listed below.

Phase II (Habitat survey) – (5 months)
Phase II will involve surveying the habitats identified in Phase I periodically over the duration of the project to monitor the habitat and population of juvenile guitarfish inhabiting it. These surveys will help monitor guitarfish populations in these areas and the environmental factors that could be favouring their presence.

After evaluating the logistics of sampling at each site identified during Phase I, we will determine which of these sites will be monitored on a monthly basis during the study period. Based on the type of habitat and accessibility we will finalise a standard sampling protocol which will be followed at each site. Based on the habitat characteristics of the sites already identified, I plan on collecting data during low tides (water level < 50cm). I will walk line transects that will run perpendicular/parallel to the shore, guitarfish sighted within 3 m on either side of the transect line will be counted, location of sighting marked, total length will be visually estimated, and behaviour will be noted (actively swimming, resting, feeding etc.) for each individual.

Data on environmental parameters (temperature, depth, salinity and pH) at the site where the animal was sighted will also be collected. This will help identify if there is any correlation between these environmental parameters and the presence of the juvenile guitarfish.

Data compilation and analysis – (Simultaneously throughout the study period)
Alongside the collection of data throughout this project, we will also compile and analyse the data collected. Through this we aim to identify trends and patterns in the data set. With the help of multivariate analysis we will try and determine the significance that particular biotic and abiotic factors play in determining particular sites as more suitable habitats for the juvenile guitarfish.

Publish findings – (last month of project and the months following the end of the fieldwork)

Once the data have been compiled and analysed, we will begin working towards publishing our findings and also acquiring additional funding to continue with the work in order to collect data from across seasons.

Reasoning
The line transects are a less invasive technique as compared to the mark-recapture method we had initially proposed. It will still allow us to estimate relative abundance of the juvenile guitarfish which is an important factor in identifying potential nursery sites. These changes to the study design and methodology have been made based on further discussions regarding the logistics and scientific contributions of the project with experienced researchers from the Nature Conservation Foundation.

Due to variations in habitat characteristics, details regarding the sampling protocol in Phase II will be finalised only once we have identified which sites will be monitored, in order to design a protocol that will be best suited for the habitats identified during Phase I.

References

Last P., White W., de Carvalho M., Séret B., Stehmann M., & Naylor G. 2016. Rays of the World. 907 Clayton: CSIRO Publishing.

Jabado RW. 2019. Wedgefishes and Giant Guitarfishes: A Guide to Species Identification. Wildlife Conservation Society, New York, United States. 30 pp.