

Project Update: March 2018

Achievements so far:

1. To estimate population density, habitat use and seasonal occurrence of humpback dolphins – Partially achieved - Owing to the political and security situation in the study area I was only able to conduct two phases of line transects compared to six initially planned, one each in the Palk Bay and in the Gulf of Mannar, covering an area of 850 km². Three groups of humpback dolphins were encountered in shallow, near-shore waters.
2. To assess seasonal trends in fish diversity, catch density and socio-economics of artisanal fisheries – Fully achieved - Over the past 18 months, I have been able to sample about 1200 boats to estimate fish catch including catch quantity, species diversity, fishing effort and dolphin depredation two fishing villages, one each in the Palk Bay and Gulf of Mannar, respectively.
3. To explore the extent and nature of humpback dolphin-fisheries overlap in order to evolve conservation and management strategies in the study area – Fully achieved - Humpback dolphins occupy certain pockets along the Palk Bay and the Gulf of Mannar, and come in direct contact with small-mesh artisanal gears. These conflicts have been severe in the past 10 years. Humpback dolphins not only depredate fishing gear and cause loss for artisanal fisheries, but also ingest gear materials made of monofilament (plastics) in the process. There two major concerns here. While in the short-term humpback dolphins are able to fulfil their foraging requirements by depredating fishing gear. Absence of fisheries regulatory mechanisms and decline of near-shore fish resources has severe long-term consequence to the health of humpback dolphins and their survival ultimately.

Unforeseen difficulties so far:

1. Geographic and environmental conditions of the field site: The wedge shaped coastline of Ramanthapuram district in Tamil Nadu is influenced by both the northeast and the southwest monsoon winds. The southwest monsoon is active between May and October, while the northeast monsoon is between November and April. Extreme wind speeds and high swells restrict artisanal fishing activities during these seasons. According to the season, artisanal fishers also migrate to either Palk Bay or the Gulf of Mannar in search of calm waters to fish.

These environmental factors had a direct bearing on the execution of boat-based surveys and sampling fish catch on the beach. This means boat-based line transect in the Palk Bay and Gulf of Mannar could only be surveyed for 6 months in a year (other survey related complications are discussed below). This also created challenges to sample fish catch as fishers migrate elsewhere when the monsoon winds arrive. It is quite challenging to estimate the annual fishing catch at a particular village due to these reasons.

I overcame the challenges of boat-based transects through conducting surveys when the waters were calm, under favourable survey conditions. The window period for these surveys are also small which is between 7 am and 11 am each day. After 11 am wind speeds pick up and survey conditions deteriorate. Surveys were finished within this time frame. For fish catch sampling boats were surveyed during fishing season in each field site, which is

for 6 months in a year. This allowed me to document fish catch and the interactions with dolphins.

2. Political situation and border restrictions: My field site (Ramanthapuram district, Tamil Nadu) lies close to the maritime boundary separating India and Sri Lanka. Owing to 30 years of civil war in Sri Lanka – there are many restrictions at sea. Fibre boats that are suitable for shallow waters of the Palk Bay and the Gulf of Mannar are not allowed due to security restrictions. Other restrictions include the ban on engines with more than 9 hp or outboard Yamaha engines. Surveys were being carried out despite these restrictions. However, the surveys were abandoned when the safety of the research team was in jeopardy.

Main outcomes so far:

- Baseline of humpback dolphin presence and movements: Existing knowledge about humpback dolphins in this region has been based on by-catch and stranding reports compiled by government fisheries agencies. This study confirms the presence of humpback dolphin groups in certain pockets along the Palk Bay and the Gulf of Mannar islands. When the waters of calm in the Palk Bay and the Gulf of Mannar, humpback dolphins remain near-shore. During the monsoon season when the wind speeds are high and the water turns turbid, humpback dolphins are found in off-shore waters. Daily movements of humpback dolphins were observed from shore-based sighting and fishing trips. It is likely that humpback dolphins group seasonally move between the Gulf of Mannar and the Palk Bay via the Pamban Pass.

During the Palk Bay surveys two groups of dolphins were sighted, one on the north-eastern side of Pamban island and one close to the Adam's Bridge area. The dolphins sighted near Adam's Bridge are of critical importance because there is no information on the presence or distribution of humpback dolphins in the southern part of Tamil Nadu. The Palk Bay survey not only confirms humpback dolphin presence but also indicates the possibility of dolphins migrating between India and Sri Lanka via the Adam's bridge through the international maritime boundary. Anouchika Ilangakoon, a marine biologist has documented humpback dolphins on the Sri Lankan side of the Adam's bridge.

Population density could not be ascertained through this project due to logistical challenges. However, many dolphins groups were encountered while accompanying fishermen on their fishing trips. Preliminary analysis of photo identification data shows that same individual animals and their groups are repeatedly sighted between Yanaipaar Island and Uppu Thanni Island in the Gulf of Mannar indicating the possibility of dolphins preferring certain areas.

- Status of artisanal fisheries: I was able to document fish catch in two villages, one each in the Palk Bay and the Gulf of Mannar for over 18 months. Both these villages were selected based on the type of fisheries being carried out and the depredation issues caused by dolphins. During each sampling event the following parameters were documented: boat type, gear type, gear dimensions, gear numbers, mesh size, gear material, soaking time, and

location of gear deployment, depth, dolphin depredation, fish species diversity and total fish catch.

The results of these surveys are currently being analysed, but preliminary analysis indicates that catch in near-shore waters are negligible at present. Interviews show that fish catch has reduced drastically over the years, even inside the marine protected area (MPA) despite severe conservation restrictions imposed on local artisanal fishing communities. Fishers point to the glaring gaps in conservation policy and practice. Intensification of artisanal fisheries with the use of monofilament fishing gear; unregulated near-shore bottom trawling by the mechanised fishers and climatic perturbations are some the reasons attributed to the decline of fish catch.

- Extent and nature of dolphin-fisheries interactions: The shallow seagrass beds of the Palk Bay and the coral reef islands surrounding the Gulf of Mannar are conducive habitats for the presence of humpback dolphins. Compared to other parts of Tamil Nadu coast, fish catch is higher in the Palk Bay and the Gulf of Mannar due the region's biodiversity rich habitats. Dolphin depredating fishing nets has been historic problem for artisanal fishers of the Gulf of Mannar who have been experiencing this issue for more than five decades now, whereas in the Palk Bay it is recent, emerging over the past decade.

Globally, artisanal fisheries is identified to be threat for the conservation of marine mammals such as dolphins. But the case of humpback dolphins in the Palk Bay and the Gulf of Mannar indicate otherwise. In the past fishers used large mesh nets to catch large bodied species such as sharks, rays, turtles and other marine mammals. With the expansion of mechanised forms of fishing such as bottom trawling, the large mesh nets used by artisanal fishers and other fishing practices have been curtailed. At present artisanal fishers operate in near-shore areas and use small mesh nets to target forage fish. The species of forage fish the artisanal fishers focus are also the target of dolphins. Therefore, the small mesh nets used by artisanal fishers' aggregate fish and dolphins find it conducive to depredate from the fishing gear.

In the Gulf of Mannar strict restrictions are imposed on the artisanal fishers to fish near the boundaries of the MPA. Despite such restrictions fish catch is on a decline. Mechanised boats are let to operate even inside the boundaries of the MPA at times. It is emerging that it is the artisanal fishers in the region who affected by strict conservation measures and they also incur losses in form of fishing gear damage and fish catch reduction due to dolphin depredation events.

Involvement of the community so far:

Local fishing communities were involved in fish catch sampling activities. First they assisted me in sampling the catch and after a year few individuals from the fishing community themselves began sampling the catch. By doing so they gained insights about the portending problems of near-shore fisheries decline, the reasons why dolphins are increasingly attacking their fishing gear and also pushing them to come up with long-term yet amicable solutions. Annual village level artisanal fish catch data is not available as government survey efforts are mostly concentrated on

commercial fishing harbours. Village level data collection efforts accomplished through this project could be replicated elsewhere and scaled up to monitor both biological and social conditions in which artisanal fisheries operate.

Future plans:

Yes, there are plans to continue this work in the near future. Humpback dolphins feeding especially from monofilament (plastic) gears that are widely adopted and used by fishers in this region needs to be investigated further. As dolphins bite through the net to feed on fish, they also take a big chunk of netting material, mainly the plastic nets which might have long-term effect on the survival of the animal. When dolphins depredate, they also cause immense economic loss for artisanal fisheries. With intensive mechanised fishing operations in the Palk Bay and restrictions placed due to biodiversity conservation efforts in the Gulf of Mannar Marine National Park has meant that artisanal fishers are a marginalized community in this region. The Tamil Nadu Forest Department and the Fisheries Department need to take immediate cognisance of this issue to ensure sustainable fisheries and long persistence of humpback dolphins in this region.

And next steps:

1. Conflict management plan: The first step is to come up with a conflict management plan with the participation of stakeholders including the Forest Department, Fisheries Department and representatives from artisanal fishing communities who are affected by dolphin depredation events in parts of the Palk Bay and the Gulf of Mannar. The management of near-shore fisheries is crucial in this region not only for the conservation of dolphins and protection of biodiversity at large, but also for the livelihoods and food security of artisanal fishing communities.
2. Regulation of monofilament fishing gear: The production, manufacture and distribution of monofilament fishing gears needs to be regulated. During this project the artisanal fishers pointed out that monofilament net (narambu valai in Tamil) is a major cause for fisheries decline. Monofilament nets are light to carry, transparent and can be soaked underwater for several hours compared to cotton and nylon made nets. Even if some of the artisanal fishers want to still use cotton or nylon nets, they are expensive and often not available due to the market takeover by monofilament manufacturing companies spread across Tamil Nadu state.
3. Sensitising Forest and Fisheries Department officials: The turn over period of the Fisheries and MPA managers are rapid in Ramanathapuram district. New officials are appointed every 2 to 3 years and it takes at some time for the newly appointed to get acquainted to the pressing conservation issues in the region. On the other hand, the ground staff such as the fisheries inspectors, forest guard and watchers remain in particular area for longer time periods. Overall, the Forest and Fisheries Department officials need to be made aware of the complex fisheries management issues and its repercussion on marine organisms and also encouraged to come up localised solutions.

Sharing results:

I plan to share this work through research paper publication, popular writing, conference/symposium presentations and a short documentary film.

The findings of this research entitled 'Humpback dolphins and their interactions with artisanal fisheries in the Palk Bay and the Gulf of Mannar, Tamil Nadu, India' was presented during the first 'Annual Wildlife Research Seminar' conducted by the Tamil Nadu Forest Department in October 2017 in Chennai, India.

I have published a research article titled 'Entangled lives of dolphins and fishers' in Seminar Magazine under the theme 'Knowledge, Use and Conservation of the Wild', Vol. 702. February, 2018. I am also translating this article in Tamil (the local language) to circulate to people in the fishing village, ground staff including watchers and guards from the Tamil Nadu Forest Department, and other officials responsible for the management of the MPA.

Project report has been submitted to the Wildlife Warden of the Gulf of Mannar Marine National Park along with recommendation for management of the marine area and dolphin conflict mitigation.

I will be making a 30 minute documentary to explore stories of near-shore fisheries decline and dolphin depredation problems from the perspective of artisanal fishing communities in the Palk Bay and the Gulf of Mannar.

Timescale so far:

The grant money is still being used to produce the documentary. The actual length of the project was projected to be 12 months. Owing to the environmental conditions and political situations in the study area, the original project was extended to 18 months

Publicity:

I have acknowledged Rufford Grants during the presentations I gave in my institution, the university and official meetings with the Forest Department. I've mentioned about the funding received for my PhD work through Rufford Grants in my institutional page. I will acknowledge the funds provided by Rufford Grants in my publications in the near future. Rufford Foundation's logo will be used while printing brochures and in the documentary film.

Comments:

I'd like to thank Rufford Foundation in supporting me during difficult times of my project fieldwork. We plan and propose a project but only in the field we encounter challenging situations that are beyond our control. My email correspondence with Rufford staff have been positive and helpful to change my plans and carry on with my project successfully.