



# UNCOVERING THE STATUS AND DRIVERS OF SHARK AND MOBULID TRADE IN RAKHINE, MYANMAR



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Myanmar Ocean Project is a registered marine conservation organization with the mission to restore and protect the health of Myanmar's ocean.

For more information see: [www.myanmarocean.org](http://www.myanmarocean.org)

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Cover Image: Eagle rays brought in to be sold by a vendor at Sittwe market. Photo credit ©Thanda Ko Gyi

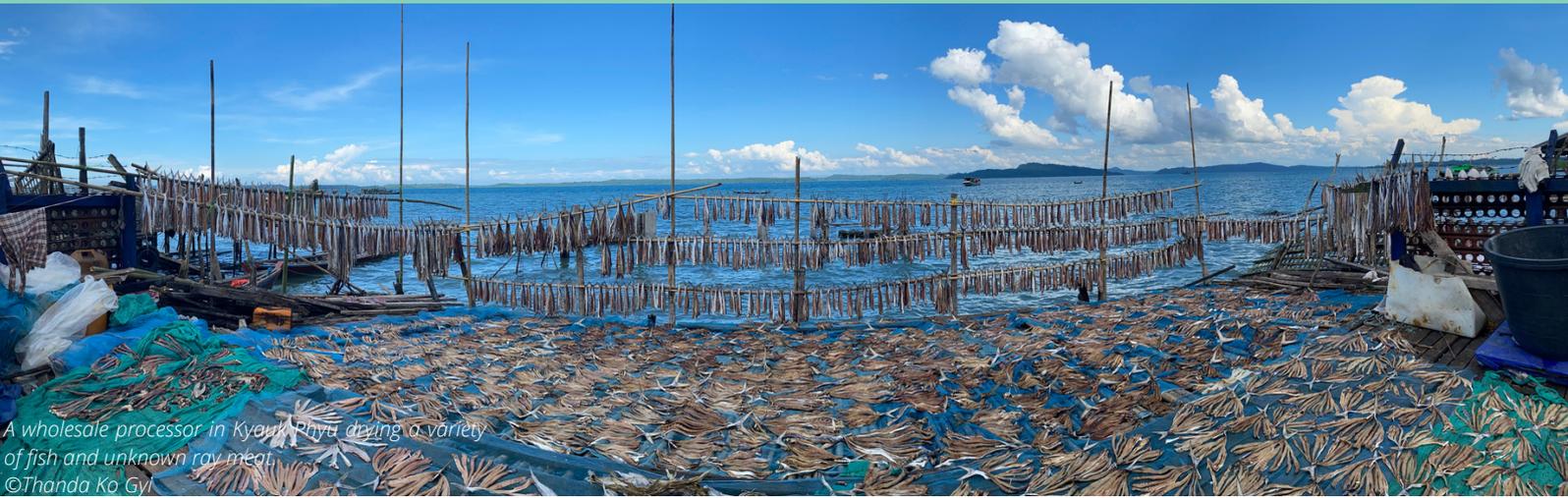
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# KEY FINDINGS



A wholesale processor in Kyauk Phyu drying a variety of fish and unknown ray meat.  
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- An increase in online(Facebook) trade for domestic consumption of shark and mobulid products was documented. Posts promoting the sale of mobulid meat to customers unfamiliar with it were observed.
- Restaurants selling dishes containing fresh and dried unknown ray meat to meet regular demand were most common in Kyauk Phyu and Sittwe.
- Consumption of shark and ray meat is a common occurrence in most of the Rakhine towns surveyed. Over 50% of respondents admitted to consuming shark products and 73% of respondents answering have consumed ray products. It was observed that a lot of the interviewees did not know how to tell apart the species of the ray they are consuming with only 47% of the ray product consumers aware that they have consumed mobulid products as well.
- The dishes containing shark, mobulid, and other rays were mostly prepared and consumed at home. The most common primary reason for consumption for sharks and mobulids was “availability” and “taste”. Meat, both fresh and dried, was the preferred part of the animals to be consumed although all parts of the animals were observed being traded and consumed.
- Almost 80% of the interviewees perceived some form of governmental agencies as needing to play a primary role to regulate trade and consumption of endangered species.
- Rapid trade surveys observed dried meat from shark, mobulid, and other unknown rays were available for domestic use in almost all local markets visited.
- Dried gill rakers and dried shark fins collectors work with wholesale vendors in Yangon who trade them internationally.

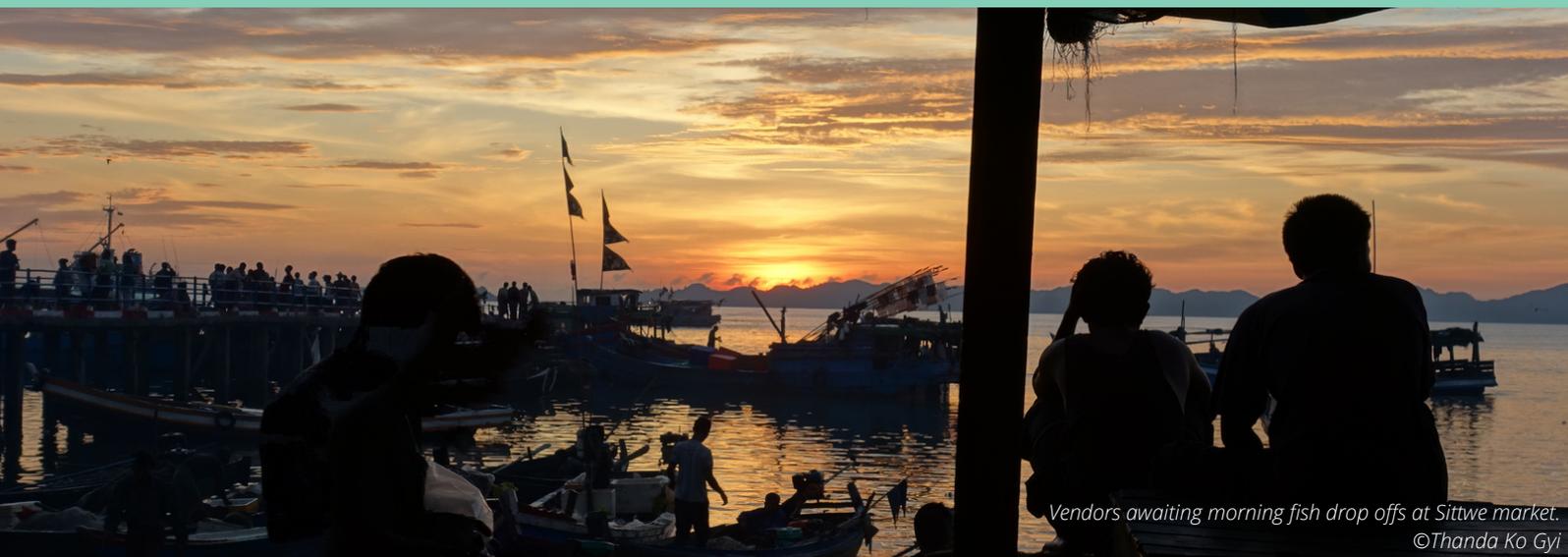
# ACRONYMS USED



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<b>CITES</b>	Convention on International Trade in Endangered Species
<b>DoF</b>	Department of Fisheries
<b>FFI</b>	Fauna and Flora International
<b>IUCN</b>	International Union for Conservation of Nature
<b>MOP</b>	Myanmar Ocean Project
<b>NPOA</b>	National Plan of Action
<b>WCS</b>	Wildlife Conservation Society

# INTRODUCTION



Vendors awaiting morning fish drop offs at Sittwe market.  
©Thanda Ko Gyi

Shark and ray population is in decline globally, due to the many threats they face including from trade for consumption of their meat, gill rakers, fins, and skins. In Myanmar, research on elasmobranch species has been limited, but observations from markets and landing sites indicate that there is strong reason to believe that capture in the country's fisheries poses a serious threat to these species.

Meat from sharks and rays, including the many endangered mobulid rays has been commonly observed being traded for consumption in Myanmar. The trade of gill rakers from endangered mobulid species including *Mobula birostris*, *Mobula mobular*, and *Mobula thurstoni* from Myanmar to China has been documented (O'Malley et al., 2016) and international shark fin trade with border countries have been observed (Howard et al., 2015).

Surveys conducted by the Ministry of Agriculture's Department of Fisheries (DoF) indicate that up to 4000 tonnes of rays, including mobulid rays, were caught and sold in the Tanintharyi region alone in 2013 and 2014.

A report from Fauna and Flora International (FFI) Myanmar also indicated an active trade of endangered shark and ray species in the Tanintharyi region.

Even though Myanmar is a signatory of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), it has yet to introduce any specific clear regulations to manage shark and ray fisheries or trade.

These shark and ray species play an important role in biodiversity conservation and support many coastal communities' livelihoods.

As such, a better understanding of the shark and mobulid trade, including drivers of the trade and characteristics of the value chain, is of utmost importance. Unlike neighboring countries, marine tourism is at its infancy in Myanmar and inadequate to provide an immediate incentive for marine protection through alternative income. The current political situation in Myanmar further limits the mid to long-term outlook for such tourism-driven incentives. Therefore, efforts to address the threat of fisheries to shark and ray conservation will need to focus on other interventions related to the incentives driving their capture, consumption, and trade.

Currently, only limited information on the drivers and motivations of shark and mobulid trade and consumption is available.

This project aims to fill this gap by investigating the motivations for trade and consumption of shark and mobulid products in Myanmar. Focusing on Rakhine state, we will build a comprehensive understanding of the drivers of sales and trade, and map trade routes. We will achieve this through the following:

1. Identify key informants and stakeholders, to identify entities involved in various supply chain stages and their roles.

2. Collect data through targeted interviews at restaurants, markets and shops in Rakhine to understand drivers of shark and mobulid product demand, and domestic trade flow and export routes. We will also gain information about how (and if) the Covid-19 global pandemic is impacting domestic and international trade.

3. Analyse data to produce a baseline report to support the National Plan of Action for sharks and rays (NPOA) implementation in Myanmar. Through the analysis we hope to understand the extent of the trade, species impacted, and key drivers and motivations for trade and consumption. We will also elaborate on the role shark and mobulid ray trade plays on the local economy if any and likely market trends.



*Gille rakers from Mobula thurstoni found at a wholesale collector at Gwa.  
©Thanda Ko Gyi*

# STUDY SITES AND METHODS

Four different types of surveys using semi-structured questionnaires were administered to key stakeholders to achieve the goals of this study. This includes surveys designed to target consumers, restaurant personnel, traders, and online vendors. The following towns across Rakhine State and nearby fishing villages were visited between October and November 2021; Sittwe, Kyauk Phyu, Thandwe, Man Aung, Kyeintali, and Gwa. Data was collected and stored on the KoBoToolbox.

Before survey questionnaires began with individual respondents, a brief explanation of the project was given and consent was obtained to conduct the interview, collect data from answers provided and for any photographs taken. All interviews were conducted in Myanmar.

The respondents were also shown a selection of pictures of different species of sharks, mobulas, and rays to establish their knowledge of the species and the local names known to them.

If a respondent did not differentiate between ray species or called them by the common name for rays, (Nga-late-kyout), it was noted as such and interview answers were recorded under “other rays”. For respondents who were able to identify mobulids as a different species, the local name for it is noted and answers are recorded under “mobulids”. Answers for all shark species were recorded under “sharks”.

Individuals under the age of 18 were not interviewed.

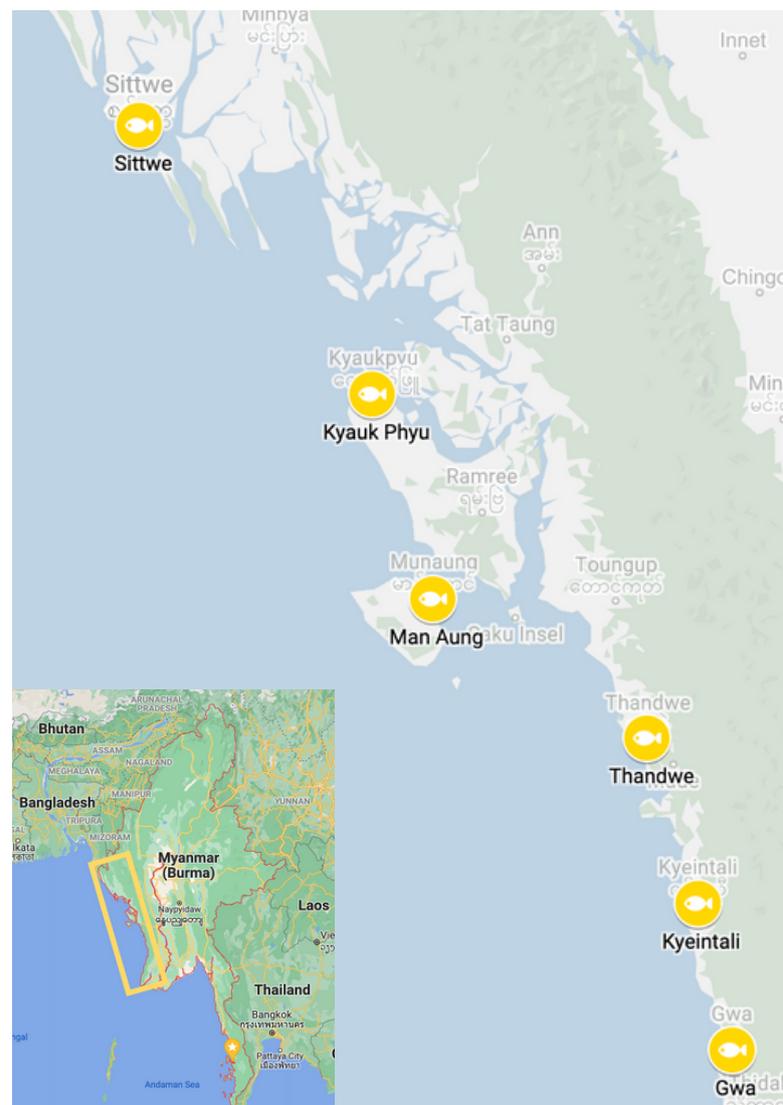


Figure 1. Map of survey sites across Rakhine state.



*Fishing boats at low tide at Thae Chaung Village  
©Thanda Ko Gyi*

1. Due to an observed increase in online trade activities during the Covid-19 lockdowns in Myanmar, a rapid internet review was conducted to understand the shark and ray product trade based out of Yangon and Rakhine state to understand the products being traded and their trade routes. Qualitative data were reviewed to understand if and how Covid-19 and the current political situation have affected the trade.
2. Restaurant surveys were conducted, targeting restaurant owners whenever possible, to determine if shark and mobulid products were being sold, and the characteristics of the trade.
3. Consumer surveys were conducted with individuals to determine if they have consumed shark and ray products and to understand their drivers and behaviours. The individuals were sampled opportunistically at each community we were at to maximise available time during our travels.
4. Rapid market and landing site surveys were conducted at each village and town visited for a preliminary assessment of local consumer demand and trade. Data was collected through interviews with individuals involved in the trade, including retired fishermen, processors, middlemen, and traders. Given the time constraints at each location and the seasonality of the trade, the individuals were identified opportunistically and through snowball sampling at each community. Efforts were made to visually inspect and take photographs to assist with identifying species encountered during these visits. Data was collected to build an understanding of domestic and international trade.

# ONLINE TRADE SURVEY

## BACKGROUND

During Covid-19 lockdowns in Myanmar in 2020, many people in the country with access to the internet turned to selling products online. Facebook was the main platform the majority of the population used and a lot of the trade activities increased during this period including for dried and fresh seafood trade.

To understand more about the online trade in shark and ray products, we conducted a brief social media review of Facebook for vendors based in Yangon and Rakhine. Facebook is by far the most widely used social media platform in Myanmar and the platform of choice for small online vendors. We reviewed groups where users advertise the sale of a variety of dried seafood as a starting point.

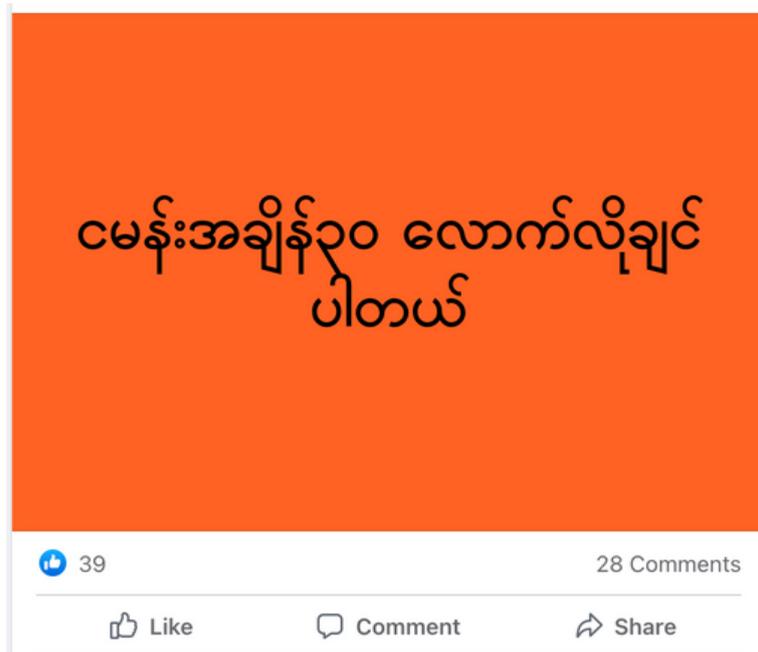
We found 16 vendors operating out of Yangon, and 5 vendors operating out of Rakhine. The trade based out of Tanintharyi was significantly larger than that of Yangon and Rakhine but they were not included in this analysis.

## METHOD

We searched for and recorded every publicly available post up until November 2021 advertising a product of shark or ray including mobula ray species. Posts were identified based on both captions and the photos shared, and products were identified in the following categories: dried or smoked mobula meat, dried or smoked unknown ray meat, dried shark meat, dried shark skin, dried shark fin and fresh shark or ray meat.

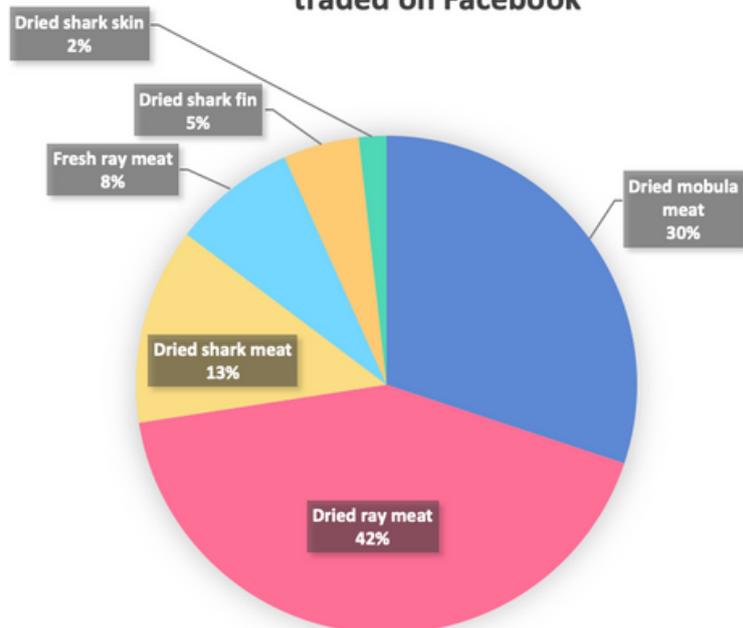
We did not encounter any online sale of other parts of shark and ray including mobula gill rakers at the time of the survey.

Efforts were made to visually confirm all the dried mobula meat products being sold were from a mobula species. Even though the posts for unknown ray and mobula ray products are recorded separately, it should be noted that both the dried meat of unknown ray species and mobulid species might be mislabeled occasionally due to the tendency by traders and processors to mix products from different species of rays. Occasionally dried mobula meat is also labeled as large ray meat (Nga-late-kyout Kyi).



A screenshot of a Facebook post in a dried seafood trading group by a user enquiring about buying 30 viss of shark meat. The post garnered 28 public replies with details of available products and contact details.

Types of elasmobranch products being traded on Facebook



A photo posted by a vendor on Facebook explaining how dried mobula meat can be consumed.

Figure 2. A chart showing the percentages of the type of shark and ray products being sold on Facebook.

## FINDINGS

Of the 21 vendors that were reviewed, only two vendors' Facebook pages were set up to sell these products prior to 2020 and the rest were created after March 2020 when Covid-19 lockdowns were imposed in most of the country. Yangon vendors had products originating both from Rakhine and Tanintharyi.

We found that a total of 674 posts were created by these vendors to advertise shark, unknown ray, and mobula ray products during the survey period. Around half of the vendors were operating out of homes and the other half had physical shops at markets. The majority of the markets located in Yangon were serving wholesale customers including Bayint Naung Market, Dayingone Market, and Wireless Market.

The highest number of sales were to advertise dried unknown ray meat (n=291), followed by dried mobula ray meat (n=198), dried shark meat (n=86), fresh ray meat (n=54), dried shark fins (n=33), and dried shark skin (n=12).

When comparing the advertised prices by one of the largest vendors in Yangon, dried shark skin was being advertised at 20000 kyats/viss\* both in 2020 and 2021. Dried unknown ray meat remained the same selling between 25000 to 30000 kyats/viss both in 2020 and 2021, dried shark meat prices remained fairly similar, being advertised between 25000 and 30000 kyats/viss during the same period. The most significant changes were with dried mobula meat which was advertised at between 45000 to 65000 kyats/viss in 2020 and reduced to 35000 kyats/viss in November 2021. Considering the price hike in fuel for fishing boats and kyat currency inflation in 2021, a significant decrease in the value of dried mobula meat was observed.

\*Viss is a traditional unit mass used in Myanmar and 1 viss is equal to approximately 1.6kg. One US dollar is approximately 1790 Myanmar kyats in December 2021 and approximately 1400 kyats in March 2020 at the start of Covid-19 lockdowns.



A photo posted on Facebook by a vendor explaining where mobula meat comes from.



A photo of dried mobula ray meat advertised on Facebook.

None of these vendors trade shark and ray products exclusively but also trade in multiple dried fish products, with a few also offering fresh seafood and wildlife meat. A few of the vendors were observed sharing recipe suggestions for preparing dried mobula meat, providing explanations for what mobula rays are, and describing the meat, indicating that the posts were intended to reach consumers who were unfamiliar with mobula meat products.

Domestic delivery services are available through all the vendors via available bus routes and online cash transfers are accepted. A number of them offer international delivery services to Japan, the USA, Singapore, Thailand, and Malaysia, and a few cargo services shipping internationally were identified.

Two Facebook groups offering a variety of Myanmar food to Myanmar consumers based in Singapore were also identified, where dried shark meat and dried mobula meat were observed being advertised, sold, and delivered through cargo services from Yangon.



A vendor on Facebook advertising dried shark skin for 3500 kyats per bundle.

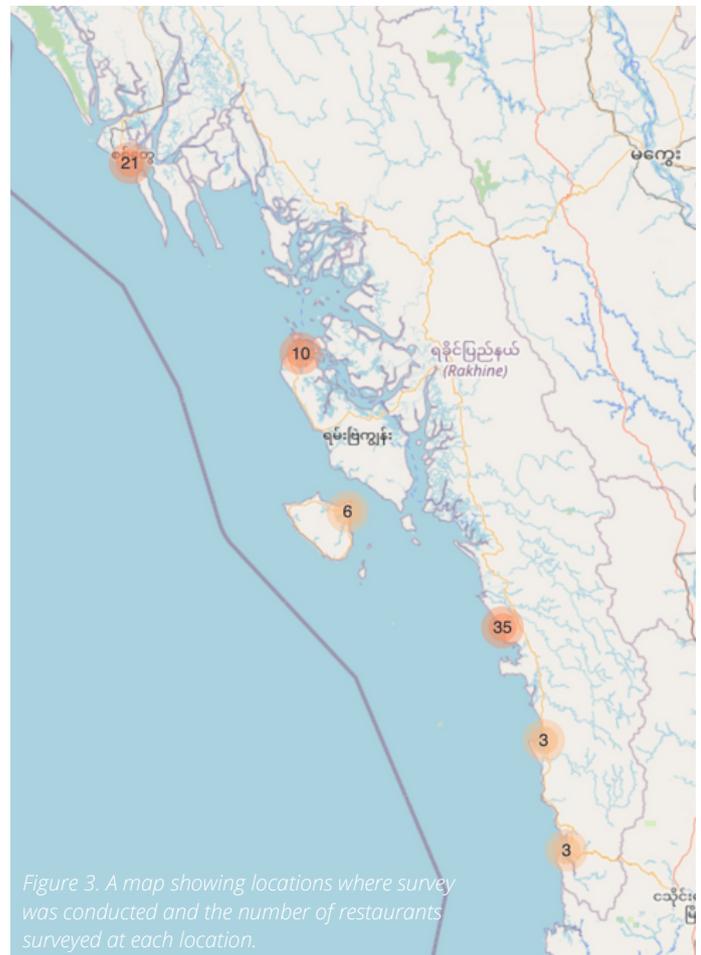
# RESTAURANT SURVEY

A total of 78 restaurants and street vendors across Rakhine were surveyed to determine if shark and mobulid products were being served to customers.

## METHOD

The menus of the restaurants were first checked to determine if the shark and ray products were being offered. If there were no menus available and food was pre-prepared and displayed, the dishes were visually checked and the shop attendants were asked if they served any dishes with a shark (Nga-man) or ray (Nga-late-kyout) products.

Upon confirmation of dishes containing shark or ray products being sold at the restaurant, we conduct an interview with the respondent using a semi-structured questionnaire.



## FINDINGS

None of the 78 restaurants surveyed in Rakhine were observed serving dishes containing shark products during the survey period.

Most respondents were not confident at identifying large rays that were being served to clarify which large ray species it might be or whether it was from mobulid species. All the respondents only refer to the dishes as being from large rays (Nga-late-kyout) and small rays (Phat-chay) which often include a few species of butterfly ray and dwarf whipray. Only one interviewee in Kyauk Phyu was able to differentiate between the mobulid species and the other ray species when describing the dish.

As such all the results from the interviews were recorded as “ray”.

Of the 78 restaurants, 23 restaurants were found to be serving ray meat (Nga-late-kyout), with the highest concentration of restaurants identified in Sittwe and Kyauk Phyu.

There is a regular demand for the dishes from ray meat in Sittwe and Kyauk Phyu and the restaurants selling the dishes serve them almost every day of the week. The price for the variety of ray dishes ranges from 1000 kyats to 5500 kyats.

None of the restaurants surveyed in Man Aung and Kyeintali were serving any shark and ray products, even though consumption of these species locally is confirmed to be common through interviews and from rapid local market observations.

Unlike in other towns catering to the local population, the restaurants surveyed in Thandwe are targeted at out of state and foreign customers on holidays in Ngapali. It should be noted that even though the number of restaurants selling ray products was low, one-third of the restaurants that did not have any shark or ray dishes on the menu responded that they take orders in advance upon customer request. The few restaurants that did serve ray meat in Thandwe responded that they were not a popular item on the menu with the tourists and prices ranged from 4000 kyats to 7000 kyats.

Percentage of restaurants serving ray products

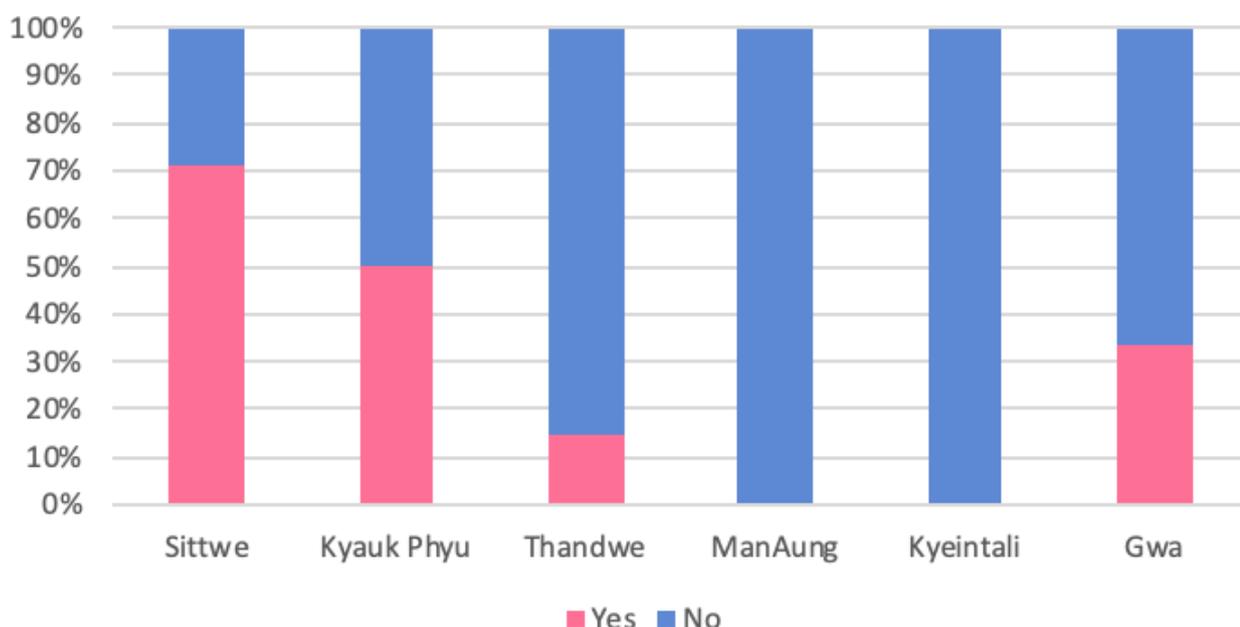


Figure 4. A chart showing the percentages of surveyed restaurants that were selling dishes made with ray products..



*Dried ray meat grilled and made into a salad at a restaurant in Kyauk Phyu*  
©Thanda Ko Gyi



*Smoked ray meat for sale at a vendor in Kyauk Phyu market*  
©Thanda Ko Gyi

## DESCRIPTION OF DISHES

The most commonly sold types of dishes by street vendors were prepared from small whole rays such as butterfly rays and dwarf whiprays, either deep-fried or grilled before being made into a salad.

Dishes prepared from dried or smoked ray meat were more commonly available than fresh ray meat, possibly due to a consistent availability of dried ray meat at local markets. The most variety of dishes was seen sold in Kyauk Phyu, including fresh ray meat soup, stir-fried shredded dried ray meat, dried ray meat salad, and fresh ray meat curry.

A few restaurants in Gwa were observed serving fried shredded ray meat as part of the selection of free side dishes on offer to dine-in customers.

None of the restaurants were observed selling dishes prepared from other parts of the ray except the meat at the time of the surveys.



*Grilled butterfly ray at a street vendor in Sittwe*  
©Nay Tun Lin

# CONSUMER SURVEY

A total of 79 respondents were interviewed using a semi-structured questionnaire to determine if they are consuming shark and mobulid products and to understand their consumption behaviours and drivers.

A collection of photographs of species of sharks, mobulids, and other rays were shown to the respondents to verify and determine their knowledge of the different species prior to being interviewed.

## FINDINGS

Of the 79 respondents interviewed, 42 were male and 37 were females, aged between 18 and 59 years old. All of them were born in Rakhine state, except eight respondents who were born in Yangon, Moneywa, and Mandalay respectively.

41 respondents out of the total 79 admitted to having consumed shark products and all answers were recorded under “sharks”.

73 out of 79 respondents answered that they have consumed ray products and answers were recorded under “other rays”. Out of the 73 respondents who have consumed ray products, 35 respondents (47% of all who have admitted to consuming ray products) were able to identify mobulid species and replied they have consumed mobulid products as well. These answers were recorded under “mobulids”.

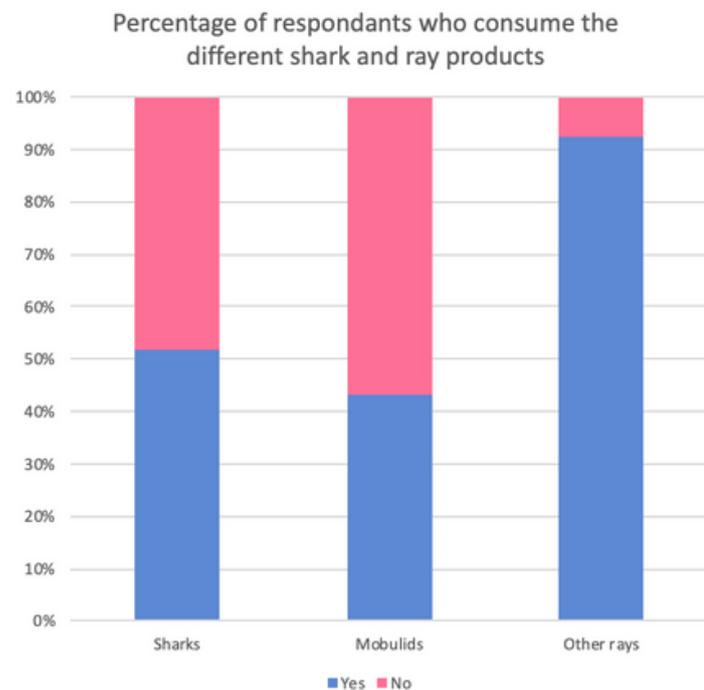


Figure 5. A chart showing the percentages of survey respondents that have consumed shark and ray products.

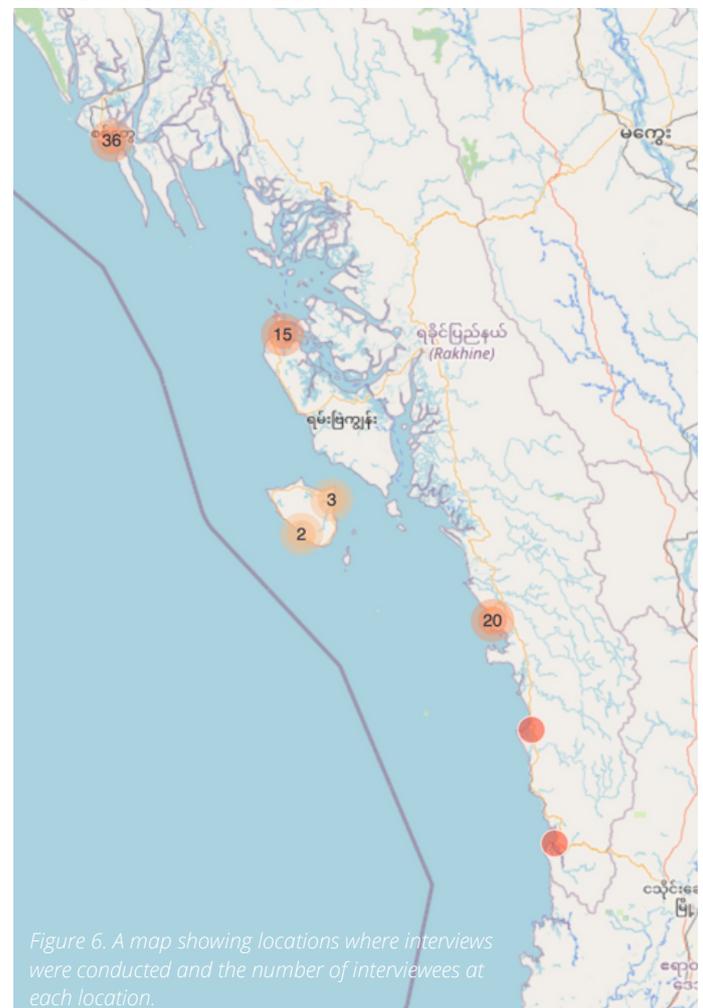


Figure 6. A map showing locations where interviews were conducted and the number of interviewees at each location.

The different names for mobula rays included Gwa, Nga-late-sune\*, Bair-late, Ou-gyi, Nga-late-kyout-kyi, and Linn-pyan and smaller ray species are most commonly called Sa-mat or Phat-chay. (\*Eagle ray species are also called Nga-late-sune.)

When asked about the reasons why they consume shark, mobulid, and other ray products, “availability and regional norms” were the most frequent replies from the respondents, followed by “taste”. There were a few beliefs and superstitions attached to consuming shark products, including consuming shark meat after being bitten by a dog and consuming shark brains because “it’s good for your blood”, but the same connotations were not attached to mobulid or other ray products. A few respondents mentioned that pregnant women should avoid consuming the liver of large sharks and rays to avoid getting rashes and feeling ill.

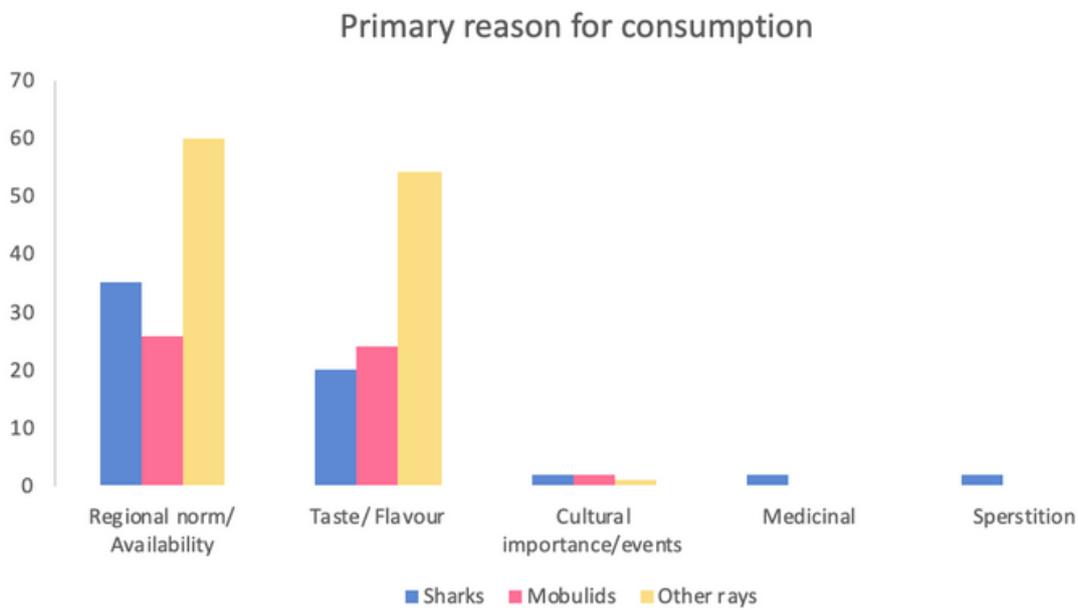


Figure 7. A chart showing the results of primary reasons for consumption of shark, mobulid and other rays products.

The respondents were also asked which part of the animal they prefer to eat and how and where they were eaten. For sharks, mobulids, and other rays, meat was the most preferred part consumed by the individuals. Shark skin seemed to be equally preferred to shark fins. A few of the respondents expressed their liking for cartilage of the mobulid rays and other rays in soups and curries. For smaller rays, such as dwarf whiprays and butterfly rays, they are often prepared whole.

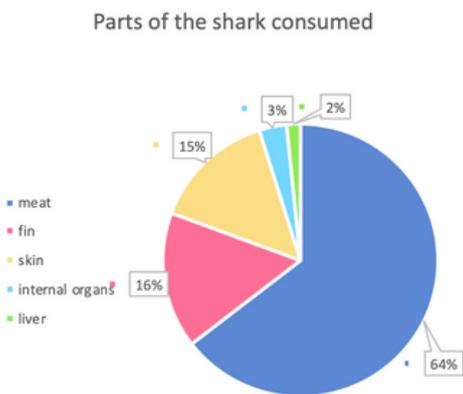


Figure 8.

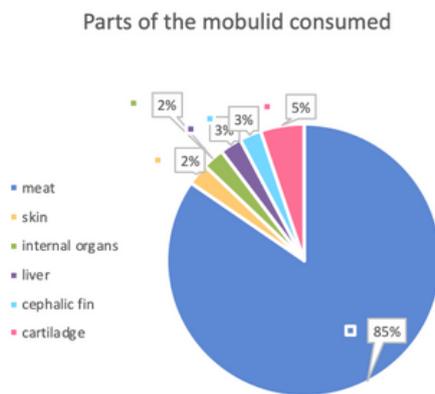


Figure 9.

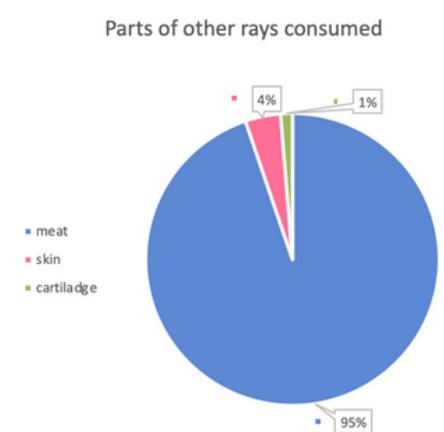


Figure 10.

Figure 8, 9 and 10. Charts showing the percentages of the different parts of shark, mobulid and other rays respondents have consumed.

Where it was consumed

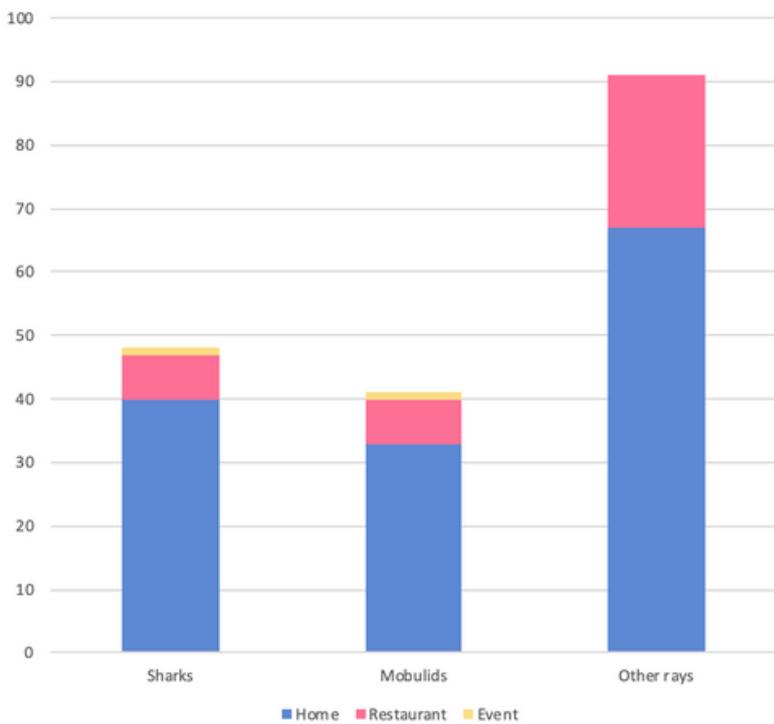


Figure 11. A chart showing where the respondents have consumed shark, mobulid and ray products

Most of the dishes were prepared and consumed at home. If there is no fisher in the household who can bring home their own catch, which is the norm in smaller fishing communities like Mun Aung or Kyeintali, the products are either purchased from a local market or directly from a local fisherman.

In all of these circumstances, none of the parts of the animals are wasted, with most internal organs either sold at a cheaper price both fresh or dried for human consumption, and sometimes for animal feed.

The majority of the respondents who confirmed to have been consuming shark, mobulid, and other ray products have been doing so since they were young, and have consumed recently in the same year. The few exceptions were people who moved away to a bigger city like Yangon for work or study where they no longer had access to “good quality, fresh” products, and less availability and/or higher prices in the villages, particularly with shark products.



# DISHES PREPARED FROM SHARK AND RAY PRODUCTS

Shark and ray meat are generally prepared and eaten like any other seafood might be at home. The sweetness and textures of the meat from different shark and ray species were the main attributes the respondents described as their fondness.

In smaller communities in Man Aung or Kyeintali, a large catch is often shared amongst the residents where all the parts are consumed including the internal organs. In the smaller villages, residents might witness the animal landing, allowing them to learn where the meat is from. This can be observed in the replies from many respondents from small communities in our surveys who knew the names for different rays and sharks and referred to mobulid species by a different name from other rays.

In larger towns, the large rays or sharks are often brought into the market to be auctioned off before it is cut up by the butcher. The animal parts are separated to be either sold by individual vendors or prepared for drying. Internal organs are often sold at a cheaper price or treated as scraps to dry. This makes it harder for individuals visiting the markets to be always fully aware of the particular species they are purchasing. Disconnection can be observed, particularly with younger respondents, or those who have not been in the fishing industry, in a big city like Sittwe or Thandwe where they are unaware of the different species names and just call them all big rays or small rays.



*A vendor in Kyeintali market sells a variety of rays and fish.*  
©Thanda Ko Gyi

**Thout San Rakhine soup** - clear soup made from fresh meat (it can be shark, mobulid, or other large rays) with coriander, lemongrass, and chilies. Prepared using chunks of meat including the cartilage. This is one of the favourite ways to cook fresh meat from large rays.



**Dried meat salad** - dried shark or large ray meat is sometimes boiled before being grilled and shredded or pounded to make a salad, usually with tamarind, onions, and chilies. This method of preparation is sometimes used before making a stir-fried dish or curry.



**Dried shark skin salad** - dried shark skin is boiled and then shredded to make into a salad with chilies and onions.

**Fresh meat curry** - chunks of fresh meat from sharks or large rays made into Rakhine curry with tomatoes, chilies, and onion.



**Grilled or deep-fried whole small rays** - Fresh whole small rays are a popular snacking dish with the locals and a lot of the street vendors sell them. They are often deep-fried or grilled whole and eaten on their own with chilies, tamarind sauce, or made into a salad with onion, chilies, and lime.

**Dried large ray or mobula ray meat pounded and cooked with potatoes** - A few respondents indicated that for wedding receptions and Shin-pyu ceremonies, a traditional Buddhist ceremony where young boys enter the monkhood for a short period of time, serving dishes prepared using dried large ray meat or dried mobula meat with small Rakhine potatoes were popular and customary.



*Photos of dishes shared by restaurants and individuals from a Facebook food group.*

## CONSUMER PERCEPTIONS

A third of the respondents were aware of “some restrictions” with shark fishing and trade but with confusions over what exactly the law is or who enforces it. 52% of respondents, particularly those in smaller communities were aware that there is a decline in landings of sharks and fish in general but there was a perception that there was no risk posed to any of the ray species population.

70% of the respondents replied that they or people they know are unlikely to reduce consumption of shark and ray products even if they were to learn of the population decline. A few respondents noted that as long as there are no alternative livelihoods for fishers, “they will catch what they can and we will eat what they catch”.

The interviewees were also asked who they think plays the primary role in the conservation management of these species. The majority of them replied that a governmental department should be taking the lead in enforcing and educating. A lot of them discussed that as long as the products are being sold, consumers will continue to purchase them.

### Who do you think is responsible ?

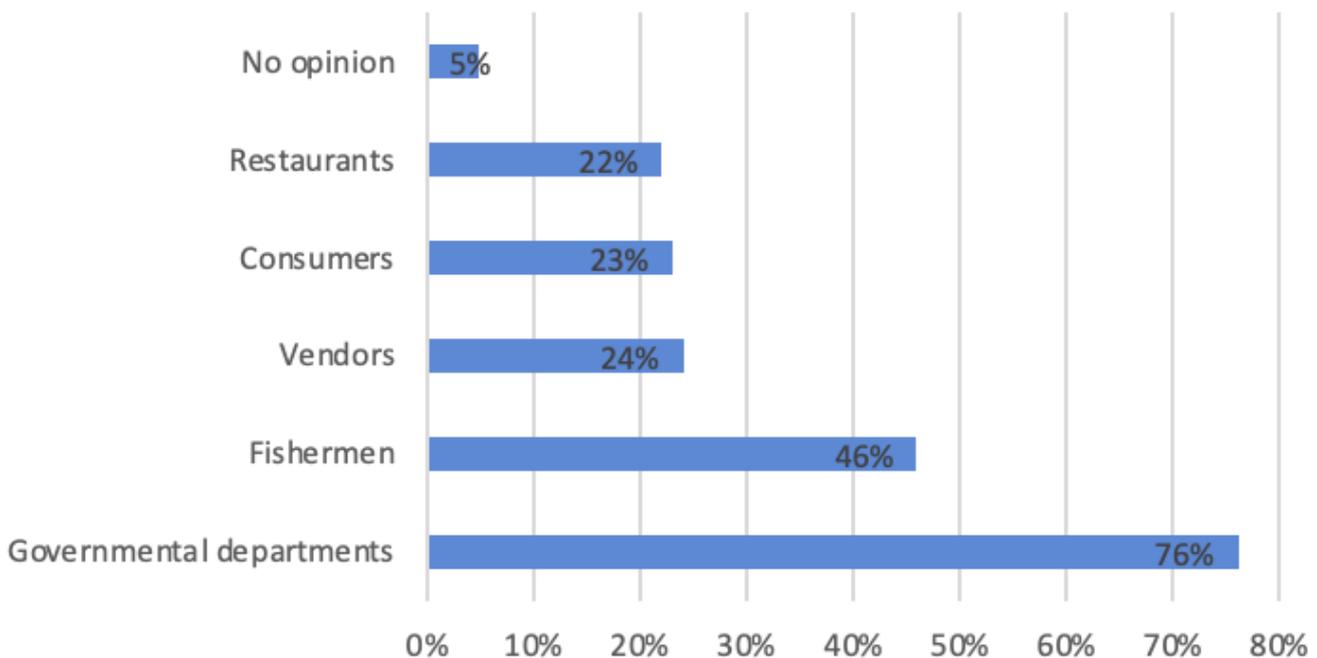


Figure 12. A chart showing the percentages of stakeholders respondents answered as having the primary responsibility for conservation management of sharks and rays.

## GIFTING BEHAVIOURS

It's quite common in Myanmar to gift each other with dried fish or prawns, particularly to those that live far from the coast. Our survey found that dried fish or prawn is still the preferred choice and serve a social status, with only 30% of the respondents replying that they have gifted or received gifts of dried shark or ray meat. A lot of these gifts were to friends and relatives who are already familiar with these products.

# TRADER SURVEY

## RAPID TRADE SURVEYS

Rapid surveys were conducted at markets, landing sites, identified wholesale shops and processing villages at each location. The following are the locations visited and elasmobranch products observed. Each location was visited between 2 to 5 times depending on how busy the trade was. It should be noted that due to time constraints at each location, weather conditions, seasonality of landings, and religious holiday closures, these surveys should be viewed only as a snapshot of the shark and mobulid trade at these locations. Ya Haing Ku Toet village and Sathwa village near Gwa were also briefly inspected along with Taunggoke market as potential significant trading sites.

The following shark species were identified as being traded; bull shark (*Carcharhinus leucas*), spot-tail shark (*Carcharhinus sorrah*), spadenose shark (*Scoliodon laticaudus*), and the following mobulid ray species; *Mobula thurstoni*, *Mobula tarapacana*, and *Mobula kuhlii*. In addition, critically endangered widenose guitarfish (*Glaucostegus obtusus*) were also found being traded at Sittwe market and Thae Chaung during the survey visits.

	Fresh shark	Dried shark meat	Dried shark fin	Dried shark skin	Fresh mobulid	Dried mobulid meat	Dried gill raker	Fresh other rays	Dried or smoked other rays	Dried ray skin
Kyauk Phyu city market and landing site	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes
Kyauk Phyu wholesale processor	No	Yes	No	Yes	No	Yes	No	No	Yes	Yes
Sittwe market and landing site	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	No
Thae Chaung landing and processing village	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Thandwe market	No	Yes	Yes	Yes	No	Yes	No	No	Yes	No
Geiktaw market	No	No	No	No	No	Yes	Yes	Yes	Yes	No
Geiktaw jetty	Yes	No	No	No	No	Yes	No	Yes	No	No
Geiktaw processing village	No	Yes	No	Yes	No	Yes	No	No	Yes	Yes
Man Aung market and nearby villages	No	No	No	Yes	No	Yes	No	Yes	Yes	No
Kyeintali market	No	No	No	No	No	No	No	Yes	No	No
Gwa market	Yes	Yes	No	No	No	No	No	Yes	Yes	No
Gwa wholesalers	No	Yes	No	Yes	No	Yes	Yes	No	Yes	No

Figure 13. A chart showing the results of rapid surveys at different locations.

### TRADE ROLES

We identified and conducted qualitative interviews with seven different traders; retired fishers from Kyeintali and Gwa, a middleman from Kyauk Phyu, and wholesale processor/trader from Geiktaw, Thae Chaung, and Man Aung.

All of them have lived and traded in the same region for more than ten years and the trader from Man Aung was the only female trader interviewed. None of them traded exclusively in shark and ray products. The traders from Man Aung and Thae Chaung are the only two interviewees currently processing, collecting, and trading both shark fins and gill rakers.

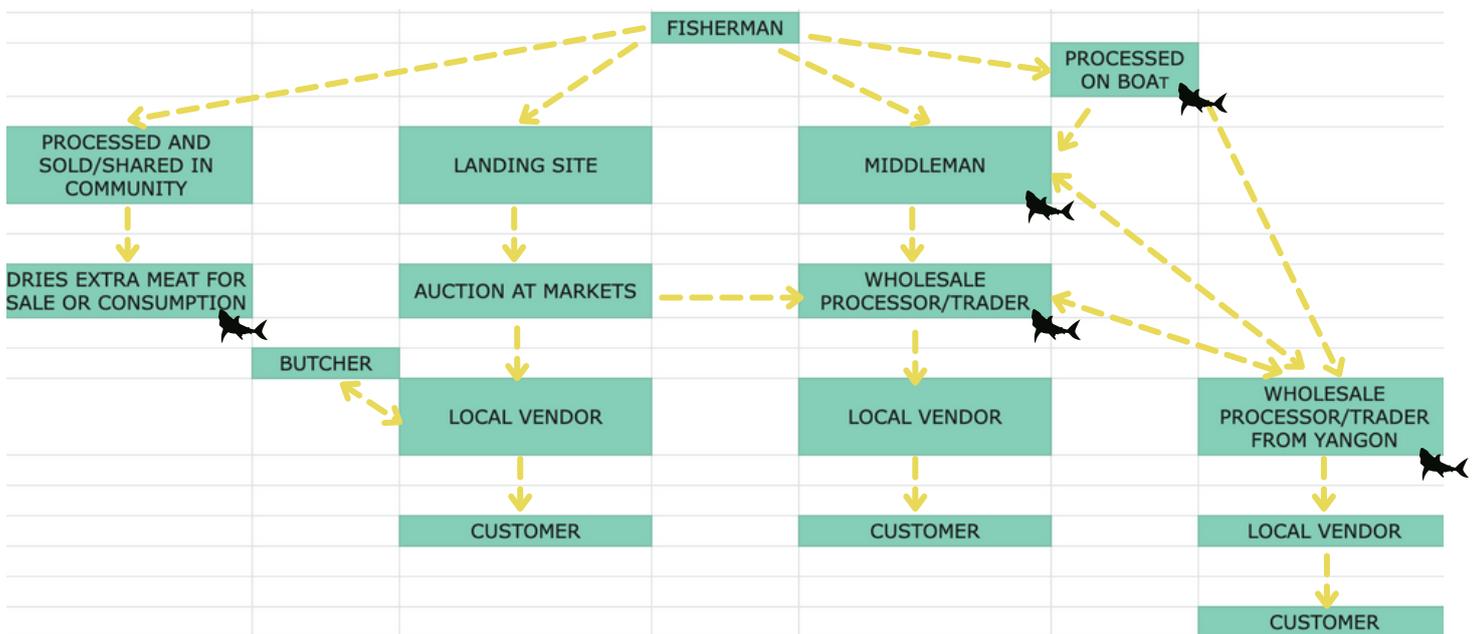


Figure 14. A chart showing the value chain of shark and ray trade in Rakhine.

The above chart explains the value chain for dried shark and mobulid meat at different locations in Rakhine for domestic trade. The shark icon  represents the point of contact for collectors seeking gill rakers and shark fins for export trade. The roles of the traders are interchangeable and not as clearly defined. This is especially true in smaller towns and villages. For instance, in small communities on Man Aung where there are no proper markets, the fisherman’s household would process and sell directly to the community.

The middleman often plays a crucial role in connecting fishermen to wholesale processors and is likely aware of what products are available and what products are in demand constantly. The out-of-town fishing crew on big trawlers usually make extra income by selling some of the boat’s haul meant to be sent back to prearranged processors, often in Yangon.

The middleman and the wholesale processors would work together to send products where there is demand. Large shark catches are often processed for fins on the boat itself and often traded directly to the collector for export. This is also conducted to avoid landing large sharks publicly.

## TRADE ROUTES

Our surveys found that shark and mobulid products are processed and traded at all the survey sites

## DOMESTIC CONSUMPTION TRADE

Shark and mobulid meat and skin products are processed in Sittwe, Thae Chaung, and Kyauk Phyu are traded locally for the huge local demand. The same products processed in Yangon are often traded back to Sittwe to meet extra demands. Thandwe, Gwa and Kyeintali also send their dried shark and mobulid meat to trade with Sittwe. Any excess dried shark and mobulid meat from Man Aung are traded through wholesale vendors in Taunggoke, with Sittwe often being the end destination.

## INTERNATIONAL TRADE

Dried large shark fins and dried mobulid gill rakers in survey locations are traded through local collectors and sent to wholesale vendors and collectors in Yangon. Mun Aung collectors work with wholesale traders in Taunggoke who send the products to collectors in Yangon. A few collectors in Taunggoke and wholesale vendors in Yangon were identified as collecting shark fins and gill rakers for exports, with China, Thailand, Singapore, and Malaysia being the end destination. Although dried shark and mobula ray meat were documented as being traded to Singapore, Japan, Thailand, and Malaysia through cargo services in Yangon, we were unable to confirm how the trade of shark fins and gill rakers are taking place. It can be assumed that the same available routes for dried meat can be used for dried shark fins and dried mobula gill rakers. There are also buses from Kyeintali and Taunggoke sending other dried and frozen seafood via trucks across the land border to China.

The maritime border with Bangladesh is also quite porous with boats trading illegal timber and live animal exports for cows and goats from Sittwe, Man Aung, and Taunggoke. A few vendors in Sittwe that were trading dried shark skins imported from Bangladesh were also observed during the surveys.

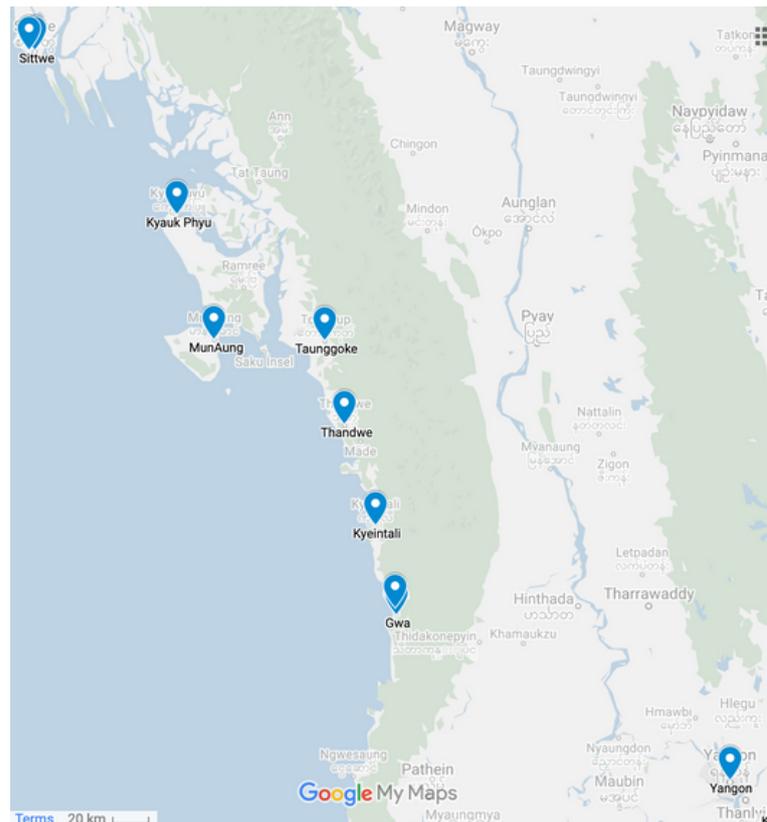


Figure 15. A map showing location of trade sites



# DISCUSSIONS

## **Porous and scattered landing sites across the coast with little to no monitoring.**

Even at designated landing sites and markets around the coast, monitoring of the species being landed by relevant authorities was not observed. Whole sharks were openly traded and processed right at the jetty in some locations. Around Thandwe, there are landings at Geiktaw jetty, all along Geiktaw beach, Linn Thar beach and even Ngapali main beach where one of the interviewees was able to purchase a whole shark from a fishing boat on the beach.

There were a few mentions of large mobulid rays being landed to be processed on the small island near Man Aung island away from the population and the same location was referred to again in Kyeintali when being informed of large mobulid landings. Similarly in a few conversations with the local traders in Gwa, it was mentioned that it's easier to land at Ya Haing Ku Toet village or Sathwa village because “no one is watching”.

In some locations, wholesale processors are directly on the water, allowing boats to deliver products directly to be processed, avoiding any ports or monitoring.

For monitoring and any sort of regulation of landing of CITES listed marine species to be effective, landing areas need to be properly set up to allow for better management.



*Mobula kuhlii being processed in a fishing village near Sittwe.  
©Thanda Ko Gyi*

**Very different domestic trade products and international trade products.**

Only products locally consumed are sold publicly in markets and online. Many products were seen being processed and collected by wholesalers for exporting to China, such as dried swim bladder, dried puffer fish, smoked sea cucumber, dried gill rakers, and large dried shark fins but were not observed at local markets. Only small dried shark fins were observed at markets for local consumption. The dried gill rakers observed being sold locally (and not from a wholesale collector for trade) at a market were sold as scraps, along with other parts of the head including cephalic fins.

**Severe lack of infrastructure, poverty, and lack of alternative sources of income or food in most fishing communities will be driving more mobulid trade.**

The combination of negative economic effects from Covid-19 and political instability in the country can be observed in the fishing communities. Most fishing communities are experiencing reduced income from higher fuel prices and less than usual exports of seafood to China and Thailand and an increase in low-risk, high-reward fishing practices such as for gill rakers and shark fins has been observed in some coastal regions in Myanmar over the past year. While most fishers interviewed noted a decrease in shark catches at landings, the same perception was not implied for mobulid ray catches and landings.

Interviews with a few local traders indicated that there may be increased targeting of mobulids in Gwa “in the last 2-3 years” and that the fishers have learned fishing methods to target mobulid rays.

On Facebook, 30% of the posts by the new vendors trading shark and ray products were advertising mobulid meat. While the decrease in dried mobula meat price was observed online, there were also a noticeable number of vendors marketing the meat to new customers, both in and outside the country, who are unfamiliar with it to encourage consumption.

**Consumers should be educated about the species they are consuming and understand the need for conservation.**

Consumption of turtle meat, turtle eggs, and dugongs, along with sharks and mobulids are a normal occurrence and there is a culture of eating everything that is caught without questioning how the individual behaviours might affect the survival of the species. Most consumers outside of the fishing trade or not part of small fishing communities have very little knowledge of the species they are consuming. For conservation management to be impactful, the consumers of these products need to be aware of first which animals they are consuming and then why the survival of these species is important to their long-term livelihood and the ocean’s biodiversity. Unlike communities in Tanintharyi who have had a glimmer of hope for marine tourism as an alternative source of income, such incentives have not existed in much of the Rakhine coast.

# RECOMMENDATIONS

In light of the current circumstances in Myanmar caused by the Covid-19 pandemic and the political situation both of which will likely affect the country's population, including the coastal communities, economically for a few years to come, it is important to consider what can be achieved in the long term with all the stakeholders playing their roles to capacity and what can be achieved now within the communities.

1. Effective management of trade through fisheries that are catching sharks and mobulids either as targeted catch or by-catch.
  - a. Laws need to be updated and enforced to limit or ban destructive fishing methods.
  - b. Marine protected areas that will effectively ban or limit catching in areas where sharks, specifically juveniles, mobulid, and other endangered rays aggregate are needed.
  - c. Species-specific protection through laws and regulations. There are currently no clear laws protecting specific shark and ray species that are “Endangered” on the IUCN Red List nor any laws protecting any of the mobulid species found in Myanmar waters. Targeted catch of these species should be banned and enforced.
  - d. By-catch mitigation should be explored and implemented.
  - e. Controlled designated landing sites to allow proper monitoring of catch.



*Dried meat strips of unknown ray species at a wholesaler in Geikaw village.  
©Thanda Ko Gyi*



A wide-nose guitarfish (*Glaucostegus obtusus*) for sale at Sittwe market.

©Thanda Ko Gyi

2. Effective management of trade of shark and mobulid products both as dried and fresh products being traded for domestic and international consumption. Meat consumption of sharks and rays, including mobulid rays, should be discouraged for communities that are not dependent on them for their source of protein.

- a. Monitoring of wholesale and retail shops trading dried products from sharks, and rays including mobulids.
- b. Training stakeholders on how to identify different types of species and parts.
- c. Monitoring of wet markets and landing sites (Arunrugstichai et al., 2018).
- d. Monitoring of restaurants.

3. Education and awareness of ocean conservation needs and how it affects the communities. It is important all stakeholders are targeted in these awareness campaigns, not just the fishers and the coastal communities.

- a. Awareness campaigns to target consumers with options for other sources of protein to avoid consuming endangered shark and ray species.
- b. Awareness and educational campaigns that focus on why millions of people living in Myanmar coastal communities need a healthy ocean and diverse biodiversity. For many of the respondents encountered during our surveys, the concept of marine conservation appeared very unfamiliar and irrelevant.

4. Collaborating with different customs departments. While we were unable to confirm the trade routes of shark fins and gill rakers during the surveys, multiple cargo services (using commercial airlines) were identified delivering dried shark and mobulid meat. Collaborating with the customs departments of these countries and airlines could deter the trade of the meat of CITES-listed endangered species.

5. Similar research to better understand the key drivers of trade and consumption and trade routes in other coastal regions in Myanmar is required to holistically understand and inform conservation management plans.

Most importantly communities should be continually supported to diversify their income, to elevate their living standards, health care and education needs, and better their environments.

### ALTERNATIVE SOURCE OF INCOME.

### ALTERNATIVE SOURCE OF FOOD.

### ALTERNATIVE LIVELIHOOD SKILLS.

It was evident that a lot of the coastal communities visited rely heavily on the fishing industry as their primary, if not only, source of income. With growing unregulated fishing, there is increasing competition and pressure on the local artisanal fishers who trade to supply in their own communities. Without other skills or income opportunities, the financial burden to catch what they can to make ends meet is immense. This has also in turn led to the consumption of less preferable catches for many of the communities.

Even though in the short term, sustainable tourism opportunities in much of the beautiful Rakhine coast seem unattainable, other sustainable sources of income, trade, and skills should be explored and supported for the communities to ease their reliance on fisheries.



*A temporary shelter on the beach for fishermen to rest.  
Man-Aung Island.  
©Thanda Ko Gyi*

# CONCLUSIONS



Sharks purchased by a vendor at Sittwe market.  
©Thanda Ko Gyi

This effort to understand the shark and mobulid trade on the west coast of Myanmar has demonstrated that while international export of shark fins and mobula gill rakers poses a serious threat to sharks and mobulids in Myanmar, domestic consumption of shark and mobulid meat along with other endangered marine species was also prevalent and needs to be addressed.

It is clear that further research and monitoring of the trade is needed to continue to better understand the threats, not just in the Rakhine region but also in other coastal regions in Myanmar.

Further, the complex drivers pertaining to different regions of the trade should also be considered when forming conservation management strategies. While much of Myanmar's coastal communities lack livelihood options and basic infrastructures such as electricity, running water, basic access to health care and education, many of the communities in Rakhine also face unique political and socio-economic challenges. Marine conservation management plans in Myanmar to protect the ocean and endangered sharks and mobulids must also consider creating and supporting sustainable livelihoods for the communities.