SUSTAINABLE TUNA PARTNERSHIP: SHARK FINNING VERIFICATION STUDY IN MINDORO STRAIT AND LAGONOY GULF

KABANG KALIKASAN NG PILIPINAS

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LIST OF ABBREVIATIONS

aFAD	Anchored Fish Aggregating Device
CITES	International Trade in Endangered Species of Wild Flora and Fauna
dFAD	Drifting Fish Aggregating Device
ENRO	Environment and Natural Resources Office
ETPs	Endangered, Threatened and Protected species
FAD	Fish Aggregating Device
FED	Fish Enhancing Device
FGD	Focus Group Discussion
GLTFFI	Gulf of Lagonoy Tuna Fishers Federation Inc.
IEC	Information, Education and Communication
IUCN	International Union for Conservation of Nature and Natural Resources
HHs	Households
IUU	Illegal, Unreported and Unregulated
KI	Key informants
LG	Lagonoy Gulf
LGU	Local Government Unit
MAO	Municipal Agriculture Office
MCS	Monitoring, Control and Surveillance
MS	Mindoro Strait
MSC	Marine Stewardship Council
OMFTFA	Occidental Mindoro Federation of Tuna Fishers Association
PPTST	Partnership Program Towards Sustainable Tuna
SDA	Secondary Data Analysis
SSF	Small-Scale Fishermen
STP	Sustainable Tuna Partnership
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

The present work is a commissioned field engagement designed to generate key information that will validate that shark finning is not taking place alongside tuna fishing, determine the impact of the fishery on ETPs and study the spatial extent, timing and location of FADs and their interactions with coral reefs/habitat.

This study was implemented in two tuna fishing grounds: Lagonoy Gulf (LG) and Mindoro Strait (MS). A total of 295 randomly selected household (HH) respondents for the HH survey-interview and 510 tuna fishers participated in the focus group discussion (FGD). Data collection was generated mainly from HH survey-interview and validated using FGD. Both data generation tools were designed to extract relevant information that validates shark finning during tuna fishing using fish aggregating devices (FADs).

The survey results focused on the three main issues and concerns which include the occurrence of shark finning during tuna fishing using FADs, the impacts of the fishery on sharks and other endangered, threatened and protected (ETP) species and the spatial extent, timing and location of FADs and their interactions with coral reefs/habitat.

Shark Finning Verification: Result obtained reveals that sharks are unintentionally caught and therefore considered "by-catch" in tuna fishing with or without the use of FADS. Across sites, tuna fishers maintained that catching sharks during tuna fishing in FADs is rare and infrequent. Should they catch one, they make full use of their catch, meaning all body parts are taken; the fins are dried and sold to local buyers while the meat is cooked for the family and some meats are shared to their neighbors.

According to tuna fishers, sharks are non-target species and are caught when they bite the bait intended for tuna. In most cases, sharks are released by cutting the tuna handlines. However, when things become inevitable and the sharks are exhausted and dying, they take it for several reasons. First, when a shark is hooked during the tuna fish operation, they lose the chance of catching tuna or other fish because of the struggling behavior of sharks when hooked. Second, despite the comparatively lower price of shark than tuna, taking the whole shark will provide them the opportunity to at least recover their fishing expenses during fishing operation. It should be noted that the subject of this verification study are small-scale tuna fishers using handlines in FADs which may be anchored (aFADs) or drifting FADs (dFADs), hence, catching tuna is their primary objective to earn a living not shark which cannot be legally sold. It is common knowledge among tuna fishers that sharks, manta rays, turtles and dolphins are protected and prohibited species under existing laws.

Findings also reveals that shark meat is utilized and cooked into a local delicacy known as "*kinunot*" in Bicol and "*nilabogan*" in Mindoro, flaked shark meat cooked in coconut milk with malunggay (*Moringa*) leaves and ginger along with other vegetables and aromatics. Some are also shared to neighbors and friends in the coastal community.

Impacts of the fishery on endangered, threatened and protected (ETP) species: In general, tuna fishers in Mindoro Strait and Lagonoy Gulf have very limited if not no idea of the impacts of shark or ETPs on the whole fishery where they depend.

Spatial extent, timing and location of FADs and their interactions with coral reefs/habitat: With very limited to zero knowledge about the interconnectedness of top predator, ecosystem and FADs, the frequent response always boils down to “No” because they argued that tuna are migratory species and does not stay in coral reef and therefore, they do not see any connection between FADs, tuna, and coral reef. Moreover, they also argued that FADs are simple in design and structure, made of light and organic materials (bamboo, coconut/buli palm leaves) and ropes. In addition, FADs are deployed away from coral reefs [12-50 km distance from the shore] and therefore will not endanger coral reefs. Moreover, lost or damaged FAD will only float and drift.

ACKNOWLEDGEMENTS

We would like to thank WWF Germany and Philippines and the Federal Ministry for Economic Cooperation and Development (BMZ) for the funds and for providing us the opportunity to be part of the Sustainable Tuna Partnership 2 in Lagonoy Gulf and Mindoro Strait on a short-term engagement. We are particularly grateful to STP 2 Project Manager and Staff for their support and assistance during data collection and for the valuable inputs in the accomplishment of this report.

Many thanks are also due to STP 2 teams headed by Overall Program Manager Ms. Joann P. Binodo, Raisa Pandan, Astrid Ocampo, Marietta V. Calaca, Leah V. Benosa, David N. David, Aida Escultor, Ma. Honey Grace Anonuevo, Manette Coralde, Charise Belga, Mark Jay Montales, Crizza Jane Yalong and Alo Lantin for the photo documentation, my Research Assistants, Richelle Bañadera and Demeterius Reyes for their efforts, patience and support during field data collection and consolidation.

We are particularly grateful to the Site Coordinators, LGU support through the Municipal Agriculture Office specially the MA and AT for Fisheries from 21 LGUs in within the Lagonoy Gulf and Mindoro Strait, Tuna Fishers and other entities who coordinated our interaction with the participants in the HH survey and FGDs. We also recognize the active participation of the household-respondents and tuna fishers for their time in sharing information with us.

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July 2022

SUSTAINABLE TUNA PARTNERSHIP (STP): SHARK FINNING VERIFICATION STUDY IN MINDORO STRAIT AND LAGONOY GULF

1. INTRODUCTION

1.1 Background

The Philippine Fisheries Code or Republic Act 8550 amended by R.A. 10654 in 2014, stipulates that "it shall be unlawful to fish or take, catch, gather, sell, purchase, possess, transport, export, forward or ship out aquatic species listed in Appendix I of the Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES), or those categorized by the International Union for Conservation of Nature and Natural Resources (IUCN) as threatened and determined by the Department", yet, it could not be denied that shark finning still exists. According to Senator Legarda, news report has shown that fishermen engaged in the act of shark finning without apprehension (AsianScientist, Feb. 19, 2012).

Certainly, fishing sharks for their fins has provided important livelihoods in some fishing communities in the country. In some cases, sharks are by-catch from tuna fishing using fish aggregating devices (FADs). Fish aggregating devices (FADs) are deployed to aggregate fish over a limited area to improve fish catch while fish enhancing devices (FEDs), which are FADs deployed in no-fishing areas, are fast gaining popularity as a fisheries management tool in the western Pacific (Cabral et al., 2014). However, the same devices were observed to enhance catch per boat when total fishing pressure is low, but can exacerbate fishery collapse when fishing effort is high while FED-based systems can increase the resistance of the fishery to collapse (Cabral et al., 2014).

Fish, sharks, rays, turtles, and other megafauna are easily entangled and injured in the ropes and nets of FADs, and when they are unable to escape, they drown (Worm, 2021). Species not targeted by fisheries may still be attracted to FADs, thus increasing their risk of being caught as bycatch. It is estimated that vessels that fish using FADs capture five times more bycatch than those that do not (Mongabay, 2021). It was estimated that in 2018, 53-89% of tuna sold was associated with FADs (Gomez, 2020). In addition to increasing bycatch and entanglement, FADs may put sensitive and protected habitats and species at risk (Gomez, 2020).

With the certification of Philippine Small-Scale Yellowfin Tuna (*Thunnus albacares*) Handline Fishery of the Philippine Tuna Handline Partnership (MSC client group composed of small-scale tuna fishers and tuna processors under the Marine Stewardship Council (MSC), it is imperative that fishing activities should be conducted in such a way that allows productive and healthy fish populations and does not harm to habitats and endangered species to ensure the health of the ecosystem. In this regard, this proposal was conceptualized to validate the issues pertaining to the involvement or non-involvement of certified tuna fishers into shark

finning including the impacts of the fishery on ETPs and the surrounding environment such as coral reef areas

The present work is a commissioned activity aimed at gathering evidence of FAD interactions on ETPs species and critical habitats, in order to meet MSC conditions on the adequacy of information for assessing the impacts of FADs and to provide external validation that is highly unlikely that the shark finning is taking place, in order to close out the MSC Conditions on shark finning.

1.1.1 Expected Output

The consultant is expected to tender his technical report with all supporting documents on the FADs interaction with shark and other ETP species and shark finning in Lagonoy Gulf and Mindoro Strait.

1.1.2 Geographic Scope of the Study

The geographic scope of the project consists of two (2) major tuna fishing grounds: Lagonoy Gulf covering the municipalities of Rapu-Rapu, Bacacay, Malilipot, Tabaco City, Malinao, Tiwi in Albay; Sangay, Tigaon, San Jose, Presentacion, Lagonoy, Caramoan in Camarines Sur and San Andres, Virac and Bato in Catanduanes, and Mindoro Strait covering the municipalities of Paluan, Mamburao, Sta Cruz, Sablayan, Rizal, and Calintaan in the province of Occidental Mindoro.

2. METHODOLOGY

2.1 Study Area

The focus of the study is municipalities in Lagonoy Gulf and Mindoro Strait as shown in Figure 1. Lagonoy Gulf (LG) is one of the largest and most important fishing grounds in the Bicol Region. It is bordered by 15 municipalities covering 165 coastal barangays from the three provinces namely Albay, Camarines Sur, and Catanduanes. It lies approximately from 123°31'37" E to 124°20'36" E longitude and 13°44'33" N to 13°10'33" N latitude (Olaño, et al., 2017). LG has an area of 3,070 km^2, of which 80% is between 800m and 1,200m.

The fisheries are known for tuna and tuna-like fishes exploited by multi-gear fishery. The gulf is a rich tuna fishing ground in the central-eastern part of the Philippines. Based on NSAP Bicol data on tuna catch per fishing ground, LG had the highest Tuna catch landings in Bicol Region with 5,837.67 mt. LG was also the project site of WWF-Philippines' Partnership Program Towards Sustainable Tuna (PPTST) that supports the livelihood of artisanal tuna handline fishers by establishing long-term market access and responsible fisheries management while providing mechanisms to supply selectively-caught yellowfin tuna (*Thunnus albacares*) to market actors and environmentally conscious consumers in

Europe (https://wwf.org.ph). It is currently the project site of WWF-Philippines' Sustainable Tuna Partnership 2, which aims to increase the resilience of yellowfin tuna fishing communities to poverty and disaster.

Mindoro Strait **Lagonoy Gulf**

Figure 1. Location map of Mindoro Strait and Lagonoy Gulf

Mindoro Strait (MS) is one of the straits connecting the South China Sea with the Sulu Sea in the Philippines. Located between the two islands is the Apo Reef (the largest coral reef system in the Philippines) which divides the strait into the Apo East Pass and the Apo West Pass. It lies approximately from 120° 40' 0.00" E longitude and 12° 19' 60.00" N latitude. The Mindoro Strait connects the natural resources-rich West Philippine Sea and Sulu Sea. As such, yellowfin fishing has been a major fishing industry for Occidental Mindoro.

Similar to LG, the WWF Partnership Program Towards Sustainable Tuna (PPTST) that supports the livelihood of small-scale tuna handline fishers in Sablayan, Sta Cruz, Rizal, Calintaan, Mamburao and Paluan has worked together with BFAR in the development and implementation of a local tuna management plan since 2016.

Both the Gulf of Lagonoy Tuna Fishers Federation Inc. (GLTFFI) and the Occidental Mindoro Federation of Tuna Fishers Association (OMFTFA) had been awarded MSC certification, but the MSC Fisheries Standard requires certification bodies to assess the likelihood that any vessel in a fishery is engaged in shark finning. It must have appropriate levels of external validation and relevant policies to demonstrate this. Should there be evidence of shark finning, the fishery will face penalties. Hence, the subject of the present validation activities is to provide fisheries with a mechanism to take actions themselves against the unacceptable practice.

2.2 Survey Design.

The study mainly used quantitative methods and included supplementary qualitative information and analysis, as the need arises. The study was conducted through a participatory

approach and made use of multi-stakeholders tools such as focus group discussion [FGD], household (HH) survey, Key informant interview [KII], Personal Observation, Photography and Secondary data analysis (SDA). Table 1 presents a summary of the objectives, key indicators, tools, and methods used for data collection.

Table 1.
Survey Objectives, Key Indicators and Methods

<table>
<tr><th>Objective</th><th>Key Indicators</th><th>Method</th><th>Tools</th></tr>
<tr><td rowspan="6">1. Gathering evidence of FAD interactions on ETPs species and critical habitats</td><td>● FADs types used by tuna fishers</td><td>● HH survey interview</td><td rowspan="4">Pre-tested HH survey instrument</td></tr>
<tr><td>● Info on ETP interactions</td><td>● Focus group discussion</td></tr>
<tr><td>● ETP species caught</td><td></td></tr>
<tr><td>● FADs' location and their interaction with coral reef</td><td></td></tr>
<tr><td rowspan="2">● Benefits and impacts of FADs in tuna and ETPs</td><td></td><td>HHS - 30 HH respondents per municipality representing the various sectors</td></tr>
<tr><td></td><td>FGD – 30 tuna fishers per site</td></tr>
<tr><td rowspan="4">2. Provide external validation that is highly unlikely that the shark finning is taking place</td><td>● Info on shark interactions encounters and ETPs mostly encountered during fishing</td><td>● Focus group discussion</td><td>● FGD</td></tr>
<tr><td>● Frequency of ETP encounters</td><td>● Key informant interview [KII]</td><td>● KI interview</td></tr>
<tr><td>● Info on possible ETP trade</td><td>● Personal Observation, and</td><td>● SDA</td></tr>
<tr><td></td><td>● Secondary data analysis (SDA).</td><td></td></tr>
</table>

2.3 Sampling Design

2.3.1 Sample Determination.

Sample size calculation followed a purposive sampling technique in order to maximize time and cost-effectiveness of the survey logistics. Although the number of samples is relatively smaller at 30 per municipality in comparison to probability sampling techniques, it does not take arbitrary units from a population to create a sample report to generalize information like statistical inferences being the general intent of a quantitative research design. The sample share from each municipality is a representative of the tuna fisher's association along the geographic scope. At least 30 HHs were involved coming from various sectors in the study area.

2.3.2 Sample Selection Process.

A simplified random sample selection process was employed and facilitated by STP2 staff. In the case of HH survey, each of the municipalities involved were requested to identify randomly from the different sectors who will participate in the activities making sure that they have comprehensive knowledge and experience in tuna fishing or any associated activity related to tuna fishing. Other interested community members, government officials, business sector, academe, tourism sector and other interested stakeholders are welcomed.

2.4 Survey Instrument

The HH survey questionnaire covers three major sections: the shark finning verification, the impacts of the fishery on endangered, threatened and protected (ETP) species and the spatial extent, timing and location of FADs and their interactions with coral reefs/habitat aside from the profile of the respondents (see Appendix 1).

The first section contains questions related to the use of Fish Aggregating Device (FAD) in tuna fishing and their experience or encounter catching sharks during tuna fishing including other ETPs. It also includes the identification of the sharks and ETPs encountered and the frequency of catching. Inquiry about shark finning was highlighted in terms of whether tuna fishers landed the whole shark with fins intact or they just take the fins and discard the body parts as well their existing awareness about the laws protecting shark and ETPs including shark finning. The negative effect of catching sharks and ETPs was also articulated.

The final set of questions was devoted to the spatial extent, timing and location of FADs and their interactions with coral reefs/habitat. The emphasis was placed on the number of FADs, location and the positive or negative effects of FADs of coral reefs and other critical habitats.

2.5 Fisheries Focus Group Discussion (FGD)

The participants for the fisheries FGD are tuna fishers in Lagonoy Gulf and Mindoro Strait (see Appendix 2). The FGD guide questions put emphasis on validating information generated from HH survey interviews. Information generated was based on the fishers' accounts and experiences. These include questions related to the use and type of FADs during tuna fishing, the sharks and ETPs encountered, the frequency of encounter including their personal accounts and experiences related the said encounters as well as whether such was the target or non-target species. It also delved into the fishers' perception on the effects of FADs on coral reefs and the fishery.

To further verify the FAD location within the fishing ground and the fishing sites where sharks and ETP were encountered, the tuna fishers-participants were requested to pinpoint in the grid map where they fish or fishing activities done as shown in Figure 2. Inquiry about the reef areas within the fishing grounds relative to FADs deployment sites were also discussed with the FGD participants.

Figure 2. Tuna Fishers identifying location of tuna fishing sites where ETP interactions encountered in Mindoro Strait (Left) and Lagonoy Gulf (Right)

2.6 Field Work Schedules

The actual fieldwork (HHs and FGDs) schedule is presented in Table 2. Simultaneous HH survey and FGD was done as scheduled in coordination with the LGU officials and other contact persons.

Table 2.
Schedule of fieldwork for Household surveys and Focus Group Discussion

Fishing Ground	Municipality	Field Schedule
Mindoro Strait	Sablayan, Mindoro Occ.	June 17, 2022
	Sta Cruz, Mindoro Occ.	June 18, 2022
	Calintaan, Mindoro Occ.	June 18, 2022
	Paluan, Mindoro Occ.	June 19, 2022
	Mamburao, Mindoro Occ.	June 20, 2022
Lagonoy Gulf	San Andres, Catanduanes	July -24, 2022
	Virac and Bato, Catanduanes	July -25, 2022
	Caramoan and Presentacion, Cam Sur	July -26, 2022
	Lagonoy and San Jose, Cam Sur	July -27, 2022
	Sangay and Tigaon, Cam Sur	July -27, 2022
	Tiwi and Malinao, Albay	Jul -28, 2022
	Tabaco and Malilipot, Albay	Jul -28, 2022
	Bacacay and Rapu-Rapu, Albay	Jul -29, 2022

2.7 Respondents

Across study areas, a total of 510 tuna fishers participated in the FGD, of which136 are from Mindoro Strait fishers and 374 are from Lagonoy Gulf (Appendix 1) while a total of 333 HH respondents participated broken down into 130 HH respondents from Mindoro strait and 203 from Lagonoy Gulf (Appendix 2).

3. SURVEY RESULTS

3.1 Shark Finning Verification

3.1.1 Respondents Profile. A total of 843 respondents participated in the study, of which 510 tuna fishers participated in the FGD and 333 household (HH) respondents participated in the HH survey. Across sites, respondents were married males with ages ranging from 20 to 76 years old with approximately 20 tuna fishing years of fishing experience.

3.1.2 Shark Encountered During Tuna Fishing. Survey results reveal that 80.31 % of the tuna fishers in MS have encountered catching sharks unintentionally. On the other hand, 75.43% tuna fishers in LG have encountered catching sharks during tuna fishing. It should be noted that tuna fishing in the study area is using selective gear types such as handlines and does not increase the risk of catching juveniles, which can fast-track stock depletion. However, it is also inevitable that sharks and ETPs are caught as a by-catch.

The top ten species of sharks in MS is presented in Figure 3 and Figure 4 for LG. The thresher sharks appear to be the most frequently captured bycatch species in tuna fishing.

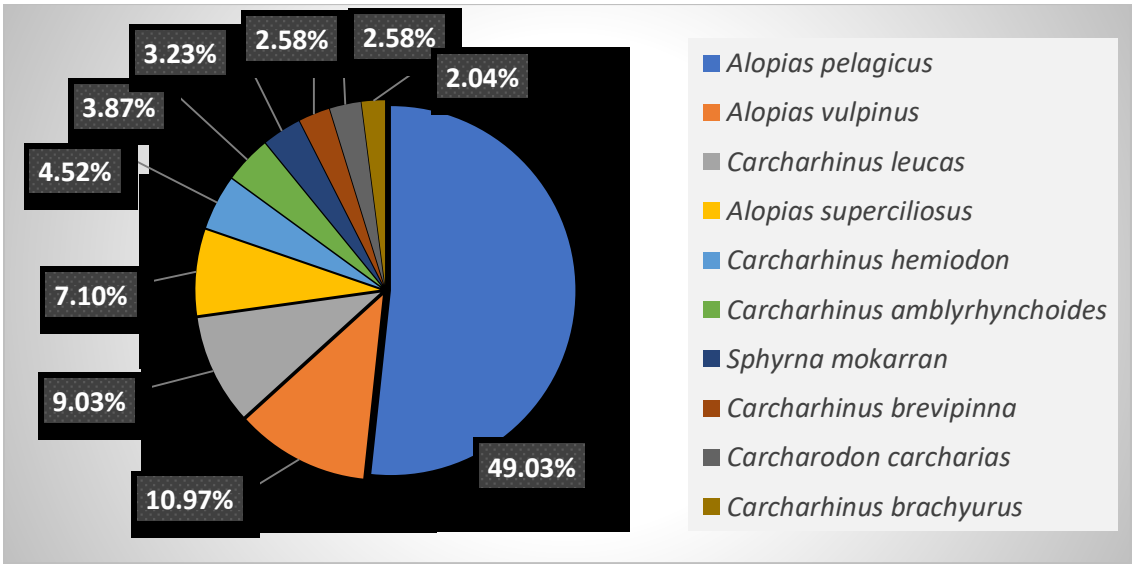

Figure 3. Top ten shark and ETPs caught during tuna fishing using FADs in Mindoro Strait

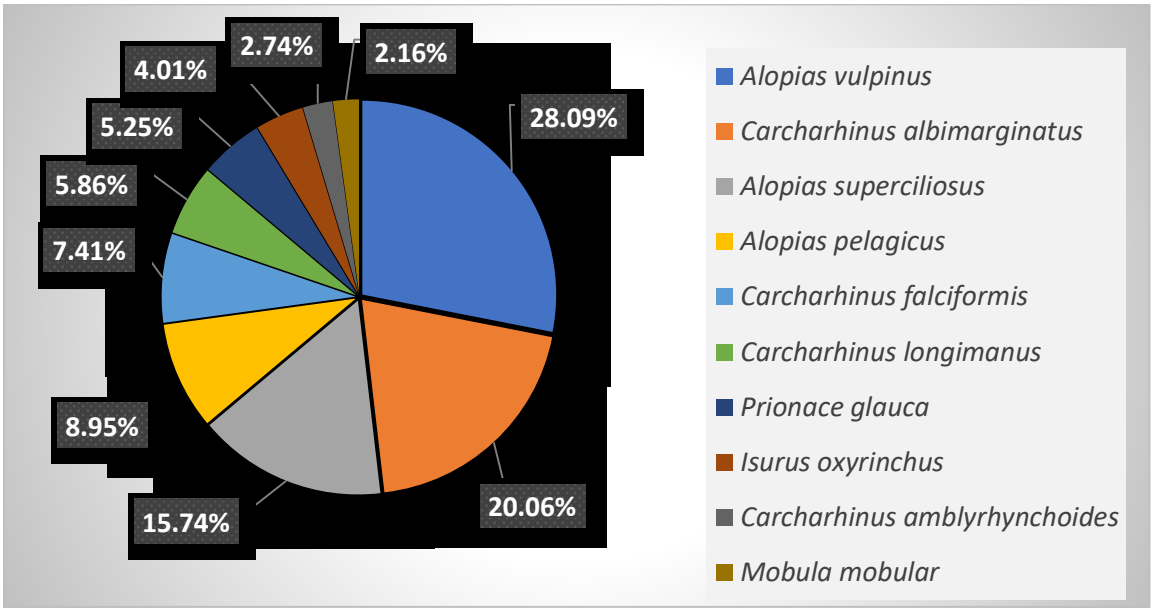

Figure 4. Top ten shark and ETPs caught during tuna fishing using FADs in Lagonoy Gulf

It is sad to note that most of the listed species identified are included in the Philippine Protected Sharks and Rays and the United Nations Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES). These include Pelagic thresher shark (*Alopias pelagicus*), Common thresher shark (*Alopias vulpinus*), Big-eyed thresher shark (*Alopias superciliosus*), Great hammerhead shark (*Sphyrna lewini*), Scallop hammerhead Shark *(Sphyrna lewini), Great* white shark (*Carcharodon carcharias*), Silky shark (*Carchachinus falciformis*), and Shortfin devil ray (*Mobula kuhlii*). It should be noted that the three species of thresher sharks and great hammerhead sharks are commonly caught species reported by tuna fishers in Lagonoy Gulf and Mindoro Strait. On the other hand, Scallop hammerhead Shark was reported caught by tuna fishers from the municipalities of Malilipot, Bacacay, Sangay, Tigaon and San Andres along Lagonoy Gulf waters while Great white shark was only reported in Sangay, Camarines Sur. Silky shark, on the other hand, was reported caught by tuna fishers from the municipalities of Malinao, Tabaco, Malilipot, Bacacay and Rapu-rapu, Albay and in Presentacion, Camarines Sur while Shortfin devil ray was reported in San Andres, Caramoan, Sangay, Tigaon in Lagonoy Gulf and in Calintaan and Mabumrao in Mindoro Strait.

3.1.3 Frequency of Shark Encounters. Along the frequency of encounter or the number of times sharks can be possibly caught, results obtained showed 59.85% and 40.15% of the tuna fishers from LG and MS, respectively (Figure 5). In the context of the study, "seldom" means infrequent or rarely caught. On the other hand," occasionally" operationally means from time to time, once in while or now while "seldom" means at an infrequent interval or rarely.

In view of the infrequency or rarity of encounter, tuna handline fishers do not have the capacity to continuously catch ETPs compared Purse seine and Longline fishers. It should be noted that it is common knowledge among tuna fishers that these species are protected and illegal to catch. Unfortunately, because of the attractive price of the fins, some fishers are lured to collect shark fins if by chance they can catch one. Sometimes, "catch and release" is

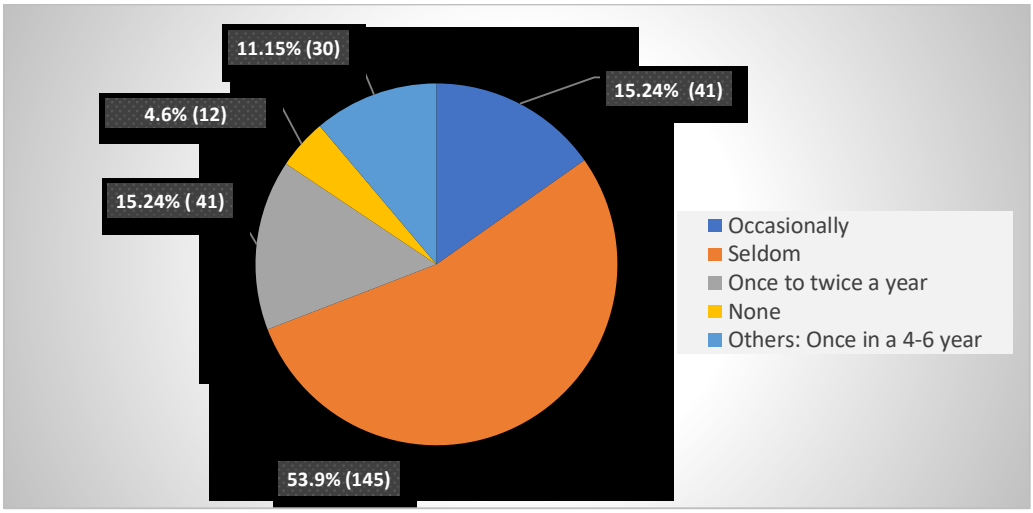

Figure 5. Frequency of Shark Encounter of Tuna Fishers in Mindoro Strait

difficult to comply with. They argued that when sharks are hooked during tuna fishing, they lose the chance to catch tuna but they must earn a living and pay for the fishing expenses. Having said this, it seldom happens that the tuna fisher is compelled to fish out the shark after all. According to fishers' accounts', thresher sharks are the most commonly encountered species caught in FAD fishing. This information corroborates with the report that thresher sharks are considered a vulnerable species worldwide (https://www.thepetitionsite.com/). Moreover, fins of wedge sharks, oceanic white tip, silky sharks, blue sharks are common in the high-end trade, but not thresher sharks.

3.1.4 Post-harvest Practices. Shark fins are traded secretly as a dried product without any documentation about the species, gear used, capture location and the manner of finning done. Results obtained from the study showed that captured sharks during tuna fishing are finned (for later drying and selling) and the whole body are brought or landed in their community. The body parts are either sold in the community and the remaining meat cooked for the family while some are shared to their neighbors or community members. However, when fishers became aware that sharks are a protected species, selling of shark meat eventually stopped.

In MS, 54.44% of the HH respondents sold the whole shark captured during tuna fishing while 45.55% claimed to have either cooked or shared it to neighbors and the community (Table 3). However, when inquired about the parts sold, 66.67% of the HH respondents said that they sell only the fins in as much as the price is relatively higher than the meat. Some 25.93% of the HH respondents disclosed that they sell the meat while a few (7.41%) utilize it as food source. In essence, after capture the fins are cut off and the body parts are taken for sale while other parts a cooked or shared to their neighbors. This in turn implies that "shark finning' or the wasteful practice of cutting off the fins and then throwing back to the sea the dying sharks is practically non-existent. The fact is, tuna fishers value shark as a food fish while the fins are high value body parts. In addition, 82.14% of the HH respondents are aware that shark-finning is prohibited by law.

Meanwhile, in LG, majority (88.19%) of the HH respondents positively responded that they sell the whole fish (shark) and the remaining 11.81% disclosed that they do not sell the whole fish, but set aside the fins. HH respondents that do not sell the whole fish, split it as follows: 24.53% fins only, 33.96% sell the meat and the remaining (41.51%) body parts are cooked for food and the rest are shared to their neighbors (Table 4). It is also interesting to note that almost all (95.32%) of the HH respondents in LG are aware that shark finning is illegal and prohibited by law making it a deterrent to practice *shark finning*.

In summary, across study sites, "shark finning" or the wasteful and unsustainable practice where sharks are caught and their fins are cut off and the body of the shark is discarded is not happening. The fact is while the fins are removed after capture, shark meat is utilized as food fish. While in general, the market price is low and cannot be legally sold, it has market value of paramount importance to tuna fishers or fishers in general.

Table 3.
Shark post-harvest practices in Mindoro Strait

BASELINE	Sablayan	Mamburao	Calintaan	Sta. Cruz	Rizal	F	%
Part of the shark is sold?							
Fin only	8	4	0	1	5	18	66.67
Flesh [Meat]	0	2	0	4	1	7	25.93
Other body parts [Use for food],	0	0	0	0	2	2	7.41
Sub-total	**8**	**6**	**0**	**5**	**8**	**27**	**100**
If only the fins are taken, what do you do with the other body parts?							
Thrown back to the sea live after cutting the fins	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Flesh [Meat] is used as bait	0	0	0	0	1	1	4.55
Others: Used as food for the family, some are shared to neighbors	17	1	0	0	3	21	95.45
Sub-total	**17**	**1**	**0**	**0**	**4**	**22**	**100**
Do you know that shark-finning is prohibited by law?							
Yes	20	20	28	0	24	92	82.14
No	4	0	0		1	5	4.46
None	15	0	0	0		15	13.39
Sub-total	**39**	**20**	**28**	**0**	**25**	**112**	**100**

Table 4.
Shark post-harvest practices in Lagonoy Gulf

BASELINE	Albay	Catanduanes	Cam Sur	Total	%
Part of the shark is sold?					
Fin only	13	0	0	13	24.53
Flesh	17	0	1	18	33.96
Other body parts,	21	0	1	22	41.51
Sub-total	**51**	**0**	**2**	**53**	**100**
If only the fins are taken, what do you do with the other body parts?					
Thrown back to the sea live after cutting the fins	0	0	0	0	0
Flesh is used as bait	0	0	0	0	0
Other: Food	9	0	1	10	100
Sub-total	**9**	**0**	**1**	**10**	**100**
Do you know that shark-finning is prohibited by law?					
Yes	81	26	76	183	95.31
No	2	4	1	7	3.65
None	0	0	2	2	1.04
Sub-total	**83**	**30**	**79**	**192**	**100**

3.1.5 Awareness of Shark-finning. To determine awareness among tuna fishers about "shark finning', a question was posted about the post-harvest practices after the capture of shark. Accordingly, the responses across sites clearly indicate that the whole shark is taken but the fins are set aside while the meat are sold or cooked for family consumption while other are shared to neighbors (Table 5 and 6). In addition, tuna fishers in MS and LG are fully aware of the existing prohibition in the catching of sharks and other ETPs. As a matter of fact, when inquired about the law pertaining to protection of ETPs, 82.14% and 95.32% of the HH respondents from MS and LG, respectively are aware that shark finning is illegal and prohibited by law. It should be noted that R.A. 10654, the amended Fisheries Code of the Philippines stipulated that it shall be unlawful to fish or take, catch, gather, sell, purchase, possess, transport, export, forward or ship out aquatic species listed in Appendix I of the Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES), or those categorized by the International Union for Conservation of Nature and Natural Resources (IUCN) as threatened and determined by the Department

In addition, they are also aware that this practice is a clear violation of MSC certification. According to the MSC certification, any company or fisher convicted of shark finning, and any vessel implicated in conviction, will not be eligible for MSC certification for at least two years. In addition, if evidence of shark finning is detected during an audit or assessment, a fishery will face suspension unless it can show the offending vessel has been expelled from the certificate.

3.2 Impacts of the fishery on endangered, threatened, and protected species (ETPS)

3.2.1 Endangered, threatened, and protected (ETP) species caught in FADs. The list of sharks and other ETPs caught along the FADs during tuna fishing is presented in Table 5 and 6. Aside from sharks, marine turtles, dolphins, and manta rays are also unintentionally caught during tuna fishing operations. However, sharks are the most frequently caught species. In MS, 67.54% of HH respondents claimed capturing sharks compared to marine turtles (7.89%), dolphins (2.63%) and manta rays (11.40%). Meanwhile in LG, capture of sharks is claimed by 96.86% of the HH respondents with only a few dolphins (2.52%).

Table 5. Sharks and Other By-Catch Identified during Tuna Fishing in Mindoro Strait

Location	Local Name	English Name	Sci, Name
Sablayan		Dog Shark	*Squalus acanthias*
	Lawihan	Common thresher shark	*Alopias vulpinus*
		Blue shark	*Prionace glauca*
	Dorado	Dolphinfish	*Coryphaena hippurus*
	Malasugi	Blue Marlin	*Makaira nigricans*
Sta. Cruz	Sablihan	Pelagic thresher shark	*Alopias pelagicus*
		Blacktip shark	*Carcharhinus amblyrhynchoides*
		Pondicherry shark	*Carcharhinus hemiodon*
	Malasugi	Sword fish	*Istiophorus platypterus*
Calintaan	Lawihan	Bigeye thresher shark	*Alopias superciliosus*
		Blue shark	*Prionace glauca*
	Lawihan	Common thresher shark	*Alopias vulpinus*
		Blunt-faced shark	*Dalatias licha*
	Surodan	Winghead shark	*Eusphyra blochii*
	Pasa-pasa	Shortfin devil ray	*Mobula kuhlii*
Rizal		Blue shark	Prionace glauca
	Krusan	Great Hammerhead shark	*Sphyrna mokarran*
	Malasugi	Blue Marlin	*Makaira nigricans*
Paluan	Sablihan	Pelagic thresher shark	*Alopias pelagicus*
	Lawihan	Bigeye thresher shark	Alopias superciliosus
		Mackerel sharks	*Lamna nasus*
	Krusan	Smooth hammerhead	*Sphyrna zygaena*
	Surodan	Smoothnose Wedgefish	*Rhynchobatus laevis*
	Pasa-pasa	Giant devil ray	*Mobula mobular*
Mabuarao	Lawihan	Common thresher shark	*Alopias vulpinus*
	Lawihan	Bigeye thresher shark	*Alopias superciliosus*
	Sablihan	Pelagic thresher shark	*Alopias pelagicus*
		Bronze whaler shark	*Carcharhinus brachyurus*
	Krusan	Great Hammerhead shark	*Sphyrna mokarran*
	Pasa-pasa	Shortfin devil ray	*Mobula kuhlii*

Table 6.
Sharks and Other By-Catch identified during Tuna Fishing in Lagonoy Gulf

Location	Local Name	English Name	Scientific Name
Tabaco	Lawihan	Common thresher shark	*Alopias vulpinus*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
	Surudan	Great hammerhead shark	*Shpyrna mokarran*
	Bolinawon	Oceanic white tip shark	*Carcharhinus longimanus*
Malilipot	Lawihan	Common thresher shark	*Alopias vulpinus*
	Sablihan,	Pelagic thresher shark	*Alopias pelagicus*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
Tiwi	Lawihan	Common thresher shark	*Alopias vulpinus*
	Sablihan,	Pelagic thresher shark	*Alopias pelagicus*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
Malinao	Araduhon	White-spotted Wedgefish	*Rhynchobatus australiae*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
	Lawihan	Common thresher shark	*Alopias vulpinus*
	Sablihan,	Pelagic thresher shark	*Alopias pelagicus*
Bacacay	Sablihan	Common thresher shark	*Alopias vulpinus*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
		Tawny nurse shark	*Nebrius ferrugineus,*
		Whitespotted bambooshark	*Chiloscylliun plagiosum*
Rapu-rapu	Sablihan	Common thresher shark	*Alopias vulpinus*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
		Tawny nurse shark	*Nebrius ferrugineus,*
		Whitespotted bambooshark	*Chiloscylliun plagiosum*
San Jose	Lawihan	Common thresher shark	*Alopias vulpinus*
	Balanakon	Silvertip shark	*Carcharhinus albimarginatus*
	Surudan	Great hammerhead shark	*Shpyrna mokarran*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
		Bignose shark	*Carcharhinus altimus*
Lagonoy	Lawihan	Common thresher shark	*Alopias vulpinus*
	Surudan	Great hammerhead shark	*Shpyrna mokarran*
	Balanakon	Silvertip shark	*Carcharhinus albimarginatus*
		Bignose shark	*Carchahinus altimus*
Tigaon	Lawihan	Common thresher shark	*Alopias vulpinus*
	Bolinawon	Oceanic white tip shark	*Carcharhinus longimanus*
	Surudan	Scallop hammerhead Shark	*Shpyrna lewini*
	Pagi	Blue-spotted stingray	*Taeniura lymma*
	Pasa-pasa	Devil ray	*Mobula kuhlii*
Sangay	Lawihan	Common thresher shark	*Alopias vulpinus*
	Sablihan	Pelagic thresher shark	*Alopias pelagicus*
	Surudan	Scallop hammerhead Shark	*Shpyrna lewini*
	Bolinawon	Oceanic white tip shark	*Carcharhinus longimanus*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
	Pagi	Blue-spotted stingray	*Taeniura lymma*
	Pasa-pasa	Shortfin Devil ray	*Mobula kuhlii*
Caramoan	Araduhon	White-spotted Wedgefish	*Rhynchobatus australiae*
	Lawihan	Common thresher shark	*Alopias vulpinus*
	Sablihan	Pelagic thresher shark	*Alopias pelagicus*
	Krusan	Great hammerhead shark	*Shpyrna mokarran*
	Dalamugon	Silvertip shark	*Carcharhinus albimarginatus*

	Pasa-pasa	Shortfin Devil ray	*Mobula kuhlii*
Presentacion	Lawihan	Common thresher shark	*Alopias vulpinus*
	Sablihan	Pelagic thresher shark	*Alopias pelagicus*
	Bangkulison	Shortfin mako	*Isurus oxyrinchus*
	Dalamugon	Silvertip shark	*Carcharhinus albimarginatus*
San Andres	Lawihan	Big-eyed thresher shark	*Alopias supercilliosus*
	Balanakon	Silvertip shark	*Carcharhinus albimarginatus*
		Blue shark	*Prionace glauca*
		Bull shark	*Carchachinus leucas*
	Surudan	Scallop hammerhead Shark	*Shpyrna lewini*
	Pasa-pasa	Shortfin Devil ray	*Mobula kuhlii*
Bato	Sablihan	Big-eyed thresher shark	*Alopias supercilliosus*
		Blue shark	*Prionace glauca*
	Surudan	White-spotted Wedgefish	*Rhynchobatus australiae*
Virac	Balanakon	Silvertip shark	*Carchahinus albimarginatus,*
	Lawihan	Pelagic thresher shark	*Alopias pelagicus*

It could be inferred from the lists that tuna fishers in LG had more species encountered but the most frequently encountered species are almost similar across study area. Perhaps the geographic location of LG along the Pacific Ocean could be the reason for the abundance of sharks and ETPs.

3.2.2 Negative Effect of Catching ETP Species. The perceived negative effects of catching ETPs are presented in Figure 6. HH respondents in MS thinks that removal or overfishing of ETPs will result to the decimation of its population (49.02%), the removal of oceanic ecosystem's apex predator will lead to food chain collapse (42.48%), that shark finning is wasteful, inhumane, and unsustainable (7.19%) and removal of ETPs will increase other fish species (1.31%).

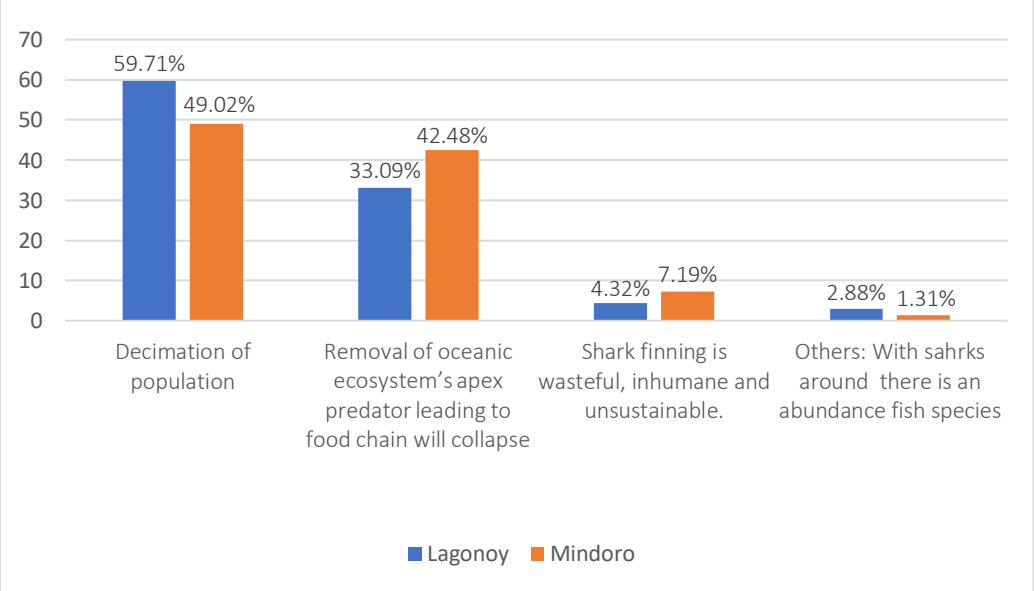

Figure 6. Respondents' distribution about the negative effects of catching ETPs

Meanwhile, HH respondents in LG disclosed that the negative effect of overfishing of ETPs including sharks would result in destroying or killing a large part of the population within the food chain or ecosystem (59.71%). In addition, the removal of the oceanic ecosystem's apex predators will lead to the collapse of the food chain (33.09%). It is also interesting to note that HH respondent thinks that shark finning is wasteful, inhumane, and unsustainable (4.32%). Moreover, from the fishers' experience and accounts, when there are plenty of sharks' arounds, fish is abundant (2.88%).

It is interesting to note that when inquired whether it makes a difference if ETPs are decimated or overfished, HH respondents have divided opinions. In MS, 51.69% of the HH respondents believed that it does make a difference and the remaining 48.31% claimed otherwise. On the other hand, a switch in the percentage that positively agree that it does make a difference was noted. Those that agree registered a 43.79% while those with dissenting perspective posted 56.21%. The differences in opinion or perspectives could be due to the general lack of information among fishers.

On the positive side, the removal of ETPs will result in species extinction, food chain collapse and ecosystem's failure including the fisheries. On the other hand, those with dissenting opinions think that ETPS overfishing is a worst-case scenario. Their argument is centered on the fact that tuna fishers using handlines rarely catch sharks or any non-target species. Besides, with handlines as their main fishing gear, they have very limited capacity to capture sharks and other ETPs. If they do capture them the option is generally to "catch and release" or utilize it to the fullest economic benefits (i.e., fins dried and sold, meat sold and cooked).

3.3 Spatial extent, timing and location of FADs and their interactions with coral reefs/habitat

3.3.1 Fish Aggregating Device (FADs) Used. Today, tuna fishers have abandoned the tradition of open water tuna fishing technique since the emergence of a new fishing aid popularly known as Fish Aggregating Device (FAD). The concept behind FADs is based on the natural behavior of tuna to congregate under floating objects on the surface of the ocean. Locally known as *payao, boya*, or *tabao*, it consists of a floating raft anchored by a weighted line with suspended materials such as coconut fronds or buri palm leaves. These are deployed in strategic areas to attract pelagic and schooling species common in shallow coastal waters at a depth of about 50-200 m.

A wide variety of fish species (i.e., tuna and tuna-like species) including turtles and sharks are known to gather around FADs. As such, "non-target" species are also caught unintentionally, hence, considered as by-catch during tuna fishing in FADs. According to Mongabay (2021), non-targeted species are attracted to FADs, thus increasing their risk of being caught as by-catch. It is estimated that vessels that fish using FADs capture five times more by-catch than those that do not. Comparatively, bycatch can be high when fishing around FADs compared to open water fishing of free school fishes.

On the other hand, according to Gomez, G., *et al* (2020), the technology allows fishers to reduce their fuel costs including carbon emissions by taking the shortest route to an area with guaranteed abundance. However, FADs have also been criticized for many negative ecological costs such as endangered, threatened and protected (ETP) species by-catch, overfishing of juveniles, harm to marine protected areas (MPAs) and sensitive habitats (Gomez, G., et al., 2020 and Curnick, D., et al (2020).

Across the study area, tuna fishers are evidently using FADs which are either anchored (aFAD) or drifting (dFAD) fish aggregating devices in tuna fishing operations. The designs and operation are generally the same except their local names. In Mindoro Strait, anchored FADs are locally known as "payao" and the drifting FADs known as "boya" while in Lagonoy Gulf, aFAD is known as *payao, boya* and *tabao* while the dFAD is known as *awad* or *pakaras*.

Anchored FADs occupy a fixed location and attach to the sea bottom using a weight made of large stone, concrete block or cement-filled drum. A rope made of floating synthetics such as polypropylene attaches to the mooring and in turn attaches to a buoy. On the other hand, drifting FADs (dFADs) are not tethered to the bottom and can be natural objects such as logs or man-made (Styrofoam). With FADs, fishers can catch a high volume of commercially valuable species in a single known area reflecting a higher catch per unit effort (CPUE). In both tuna fishing grounds, commercial fishers such as "pangulong" and "taksay" are the owners of most FADs. As a rule, small-scale fishers (SSF) are also allowed to anchor and fish in their FADs using hook and line.

In Mindoro Strait, 91.54% of the tuna fishers are using FADs in their fishing operation (Table 4) while in Lagonoy Gulf, 96.43% of the tuna fishers are into FADs. However, in terms of the number of FADs owned, the distribution MS is 13.28% owned, 42.19% shared and 44.53% have none. On the other hand, in LG, the distribution is as a follow; 23.45% owned, 32.41% shared and 44.14% none.

Along with the type of FADs, results obtained showed there are more drifting FADs than anchored FADs. In MS, 50.82% of the FADs are dFADs against 45.08% aFADS. Similarly, in LG, 56.82% are dFADS with 38.61% aFADs. Apparently, the number of FADs is related to the cost incurred in fabrication. According to fishers account, one aFAD may cost around PhP30,000 depending on the size. While dFADs are affordable to small-scale tuna fishers as the materials used are locally available. The ropes and lines as well as the coconut or *buli* palm leaves encourage the settlement of marine algae and small crustaceans and mollusks, which in turn attract small fish. Besides, an unwritten agreement exists that small-scale tuna fishers are allowed to fish in aFADs usually owned by commercial fishers.

3.3.2 FAD Deployment Location. Across the study, almost all FADs are deployed away from coral reefs. Offshore FADs were also noted deployed in MS and LG. In specific terms, 46.03% of the FADs in MS are deployed mainly away from coral reef areas while 42.86% offshore. In LG, 97.47% are deployed away from coral reef areas and only 2.53% deployed offshore. There may be a few that are deployed near coral reef areas but these are small FADs deployed about 2-3 km away from the reef areas.

Along the question of where FAD deployment would be most effective, the most effective location is away from the reef area and offshore area for obvious reasons. First, it should be away from coral reef areas to avoid potential damage (i.e., anchorage and mooring damages) and competition with reef fishers. Second, the target species are pelagic and migratory species like tuna and tuna-like species, hence, the location should be in an open water where pelagic species are congregating. For these reasons, MS tuna fishers deploy their FAD either away from coral reef areas (41.54%) or offshore (43.08%). However, in LG tuna fishers choose away from coral reef areas (88.34%) over the offshore (6.75%). In the context of the study, the term "coral reef area" refers to the critical habitat beyond sea-grass and seaweed beds where intricate and biologically diverse collections of coral species interact with each other and the physical environment and provide habitat for a large variety of marine life. On the other hand, "offshore" refers to the fishing area where open water deep sea fishing is usually done.

It is also noteworthy to mention that in both fishing grounds, there were no standard rules and regulations about FADs deployment except that is should be away from coral reefs and marine protected areas (MPAs). As a matter of fact, FADs are deployed by fishers that are non-residents of a specific locality bordering the fishing ground.

3.3.3 Potential Negative Effects of FADs on Coral Reefs. Sharks play an important role in the ecosystem. Without them, the ecosystem would collapse and the entire food chain would be affected, leading to less abundance and declining ecosystem health (https://sharkstewards.org). First, because sharks help maintain biodiversity and health of the reefs by controlling large predatory species. The decrease in sharks' population in the ecosystem will correspondingly increase the population of predators like emperors, snappers and grouper which directly affect the algae-eating species (herbivores) that are further down the food chain in the reef. With less herbivores, macroalgae expands and colonize coral reef areas affecting the balance in the reef ecosystem to an algal dominated ecosystem. With the coral reef gone, the fishery it supports will also disappear.

In Mindoro Strait and Lagonoy Gulf, tuna fishers are aware that sharks are protected species and catching or selling is illegal and punishable by fine or imprisonment or both. Unfortunately, sharks and other ETPs are unintentionally captured during tuna fishing. With the high value placed on the shark fins, tuna fishers are sometimes lured to collect shark fins for economic reasons. It is striking to note that across study areas, very few have knowledge about the ecological significance of sharks as a top predator in maintaining the reef ecosystems health and sustainability.

FGD results reveal that in most areas covered by the study, tuna fishers think that FADs have no negative effects on coral reefs and the marine ecosystem in general. Their argument is because FADs are deployed away from reef areas. For instance, in Sta Cruz, Mindoro Occidental, they are deployed 12 to 60 miles away from reef areas while in Tiwi, Albay deployment is about 12 to 15 km away from reef areas. Details of the FGD about the fishers' accounts relative to the impact of FADs to coral reef area and the reef's impacts on FADs are shown in Appendix 6 and 7.

Because of the lack of ecological knowledge about the interconnection between FADs, shark finning and coral reef ecosystems health and the fishery, they think sharks are just another fish species and a commodity which can be sold for income and food security reasons. With this line of thinking, they strongly argued the FADs do not affect coral reefs directly or indirectly because they are deployed away from coral reef areas. Besides, most of the FADs used are drifting fish aggregating devices (dFADs) and therefore do not interfere with corals underneath. In addition, the materials used are organic such as coconut leaves or *buli* palm, hence, they are considered environment friendly. Should the FADs be damaged, they just drift, decompose and are carried by the waves and therefore do not harm the critical environment. It should be noted that FADs are basically designed for tuna fishing not for catching ETPs. In case of FAD that with the float section detached and is no longer in position which may be due to intentional cutting of the rope by rival fishers or turbulent sea that damage worn-out rope, it is highly unlikely that it will damage coral reef areas because other fishers passing by may be able to recover it and redeploy it as their own at no~~t~~ cost on their part.

Along with the question on whether coral reefs have a positive effect on FADs, some tuna fishers believed coral reefs have positive effects on FADs because coral reefs are spawning ground of fishes and squids. Coral reefs can be the source of recruits for FADs and because smaller fishes aggregate or shelter into the FADS which in turn attracts larger predatory species like tuna and tuna-like fishes. This becomes an opportunity for fishers to catch more high value fish to include sharks. Aside from providing fishers the alternative to fish for pelagic species, the reef stocks are given time to recover. However, the interaction between shark extraction (or shark finning) and the integrity of the reef ecosystem is set aside. In essence, the importance of sharks as a top predator that maintains the balance between carnivores and herbivores which sustain the reef ecosystem and the fisheries is not well understood. This therefore calls for an urgent action in terms of information, education, and communication (IEC).

Catching sharks happens anytime whenever the shark smells the bait although infrequent and rare. Fishers' observation points out that in the months of February to June, the probability of catching sharks is high. Fisher's accounts reveal that sharks are accidentally caught since they stay at the same depth (35-60m) as tuna and possibly feed on tuna and accidentally take the baited hook intended for tuna. Accordingly, tuna handline fishers disclosed that they have no intention of catching sharks for the purpose of finning. However, because sharks are by-catch in tuna fishing with or without FADs, they need to get the whole fish to pay off their effort and fishing expenses. Catch and release is also practiced according to fishers accounts especially when they notice it early on.

The extent of fishing operations of tuna fishers in MS and LG is presented in Figure 7. As mentioned earlier, FADs are deployed 50-500 meters deep at 12-60 miles away from reef areas and approximately 5-100 miles away from the shore.

Key informant interviews also revealed the absence of coral reefs along the coastal areas in Occidental Mindoro but not in Lagonoy Gulf where several Marine Protect Areas (MPA) are located. In MS, the nearest MPA is the Apo Reef, a well-known protected area where fishing is not allowed. On this note, direct interaction between FADs and critical

habitat is the least that they expect to happen. Although in an ecological context, the interaction can be by way of shark finning and other ETPs by-catch extraction during tuna fishing using FADs as accessory fishing devices.

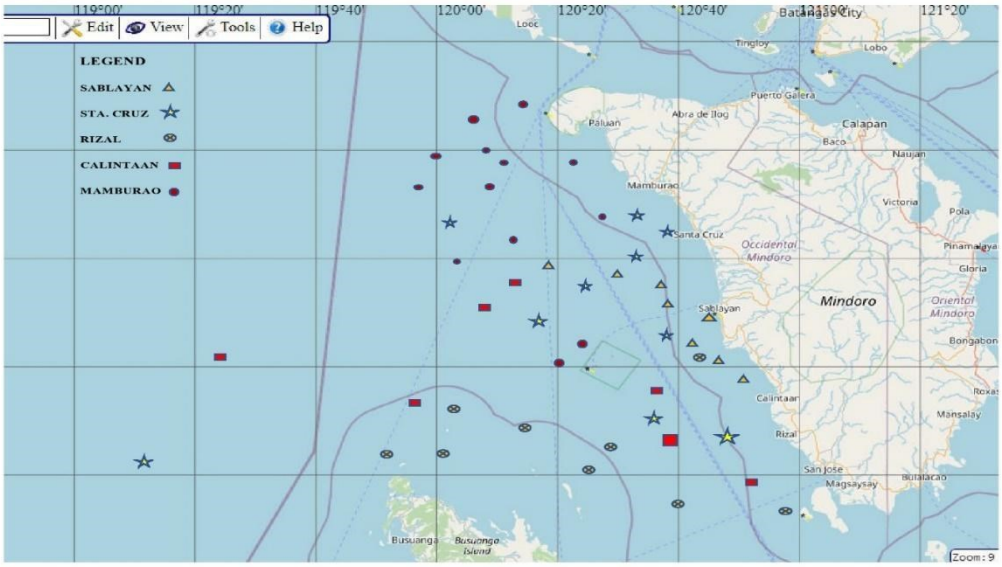

Figure 7. Extent of Tuna fishing Operation of Fishers in Mindoro Strait

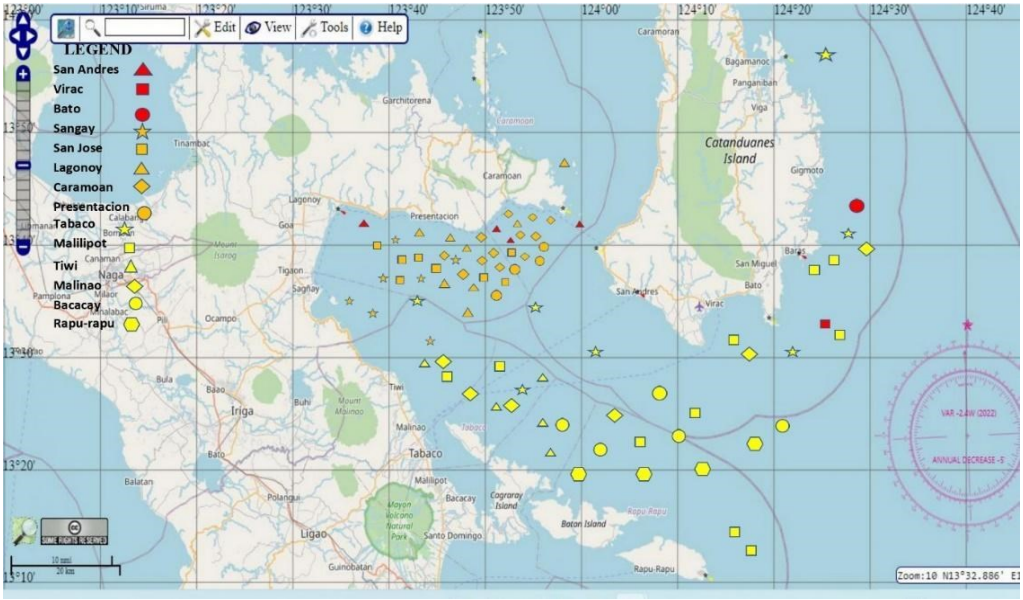

Figure 8. Extent of Tuna fishing Operation of Fishers in Lagonoy Gulf

Aside from sharks, the issue about conflict between fishers and dolphins was noted even in FAD fishing. Dolphins [i.e., Spinner and Bottlenose species] threaten fishers' catch and inflict damages to fishing gears. Even FADs are destroyed when dolphins have frenzy feeding underneath the FADs.

3.4 Shark Fin Trade

FGD results reveal that in the past, shark fins sold at PhP 900 kg^{-1}. The buyers of shark fins are Taiwanese and Japanese. A recollection from tuna fishers disclosed that before there were fishers targeting Dog shark for the liver and fins in Mamburao, Mindoro. Moreover, fishers also pointed out that there are shark and shark fin buyers from San Jose and Sablayan, Mindoro. A similar story was disclosed by tuna fishers in Lagonoy Gulf with buyers from Tabaco City and Naga City. Unfortunately, the details of the information were not disclosed.

Shark fins are dried, secretly kept and sold to buyers within the province. Buyers set the measurement rules to make it acceptable for sale at a certain price. In most cases, shark fins are kept and sold when a buyer is available but trading is not fully disclosed as **all sharks** according to the FGD participant-fishers are prohibited and protected species and selling is punishable by fine and imprisonment. While they are aware that sharks are protected species, they do not know which species are endangered, threatened and protected. At present, there are no buyers of shark fins in both fishing grounds.

4. CONCLUSION.

Based on the findings relative to the possible occurrence of "shark finning" in Mindoro Strait and Lagonoy Gulf tuna fishers with MSC certified boats, the definition of "shark finning" is inaccurate to conclude its existence in view of the following realities. Capture of sharks or ETPs are basically unintended and a non-target species, therefore a by-catch in tuna fishing. The frequency of capture is infrequent and rare. The fishing gear used (handlines) delimits extensive capture. Tuna fishers are aware that shark and ETPs are protected under the existing laws, hence, it cannot be legally sold and the business is kept a guarded secret.

It is likewise apparent that sharks are caught, finned but the body (meat) taken for sale, food and given away to neighbors. It is also important to note that shark meat is valued as food fish not only for the economic value of the fins. In a strict sense, *shark finning* is not an issue in MS and LG.

It is also common knowledge that shark fins are illegally traded at a relatively higher price. In which case, fishers are sometimes tempted to fish out instead of releasing them. Apparently, tuna fishers claimed that because sharks are non-target species, catching them disturbs and frightens the school of tunas from sheltering in FADs, fishers therefore lose their chance to catch tuna for that day. On the positive side, landing the whole fish will give them at least the opportunity to repay the cost of fuel and other expenses plus provide food fish for the family and their neighbors. On this note, banning shark catching along with tuna fishing or discouraging consumption of shark fin products can be a good management proposition but difficult to enforce.

FADs in general are not inherently bad; but requires additional attention from local government units, fishers' association and BFAR for management and monitoring. If used and managed properly, it can reduce fuel costs and carbon footprints without jeopardizing the

ecosystem or the survival of the target species. In addition, it can also assist in diverting fishing activities from the coastal and nearshore reefs.

5. RECOMMENDATION

Subscribing to the old saying in health management that prevention is better than cure. Having said this, as a preventive measure for the so-called *shark finning* issue can be monitored, species identified, reported, regulated at the LGU levels as part of Monitoring, Control and Surveillance (MCS) of LGUs.

It is recommended that the two small-scale tuna handline fisher federations, namely the Gulf of Lagonoy Tuna Fishers Federation Inc. (GLTFFI) and the Occidental Mindoro Federation of Tuna Fishers Association (OMFTFA) must conduct voluntary self-regulation measures (i.e., reducing the number of FADs, deploying biodegradable and non-entangling drifting FADs, and ensuring the rapid release of non-target species [catch and release] to prevent shark finning among its members. With this in place, MSC certification penalties can be prevented for the common good of the association and its members. It should be noted that shark finning is prohibited within MSC certified fisheries. Thus, its commitment to ensure that shark finning does not take place in MSC certified fisheries.

Finally, because of the attractive incentive from shark finning, it is very difficult to enforce the laws. As such, educating the fishers and the general public of the significant role of sharks in the ecosystem as well as discouraging people to consume shark fin soup or products from ETPs may provide greater impact. For this reason, massive information, education, and communication (IEC) is recommended.

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APPENDICES

Appendix l

Sustainable Tuna Partnership 2 (STP 2)

Informed Consent Form

ABOUT THE PROJECT
The Survey interview is one the key components of **Sustainable Tuna Partnership 2** implemented by the WWF Philippines. The activity is designed to validate that shark finning is not taking place along tuna fishing, study the impact of the fishery on ETPs and the spatial extent, timing and location of FADs and their interactions with coral reefs/habitat.

PROJECT OBJECTIVES
This engagement is designed to generate key information on the following aspects from selected stakeholder involved in tuna fishing:
1) validate that shark finning is not taking place
2) study on the impact of the fishery on ETPs
3) study on the spatial extent, timing and location of FADs and their interactions with coral reefs/habitat

PARTICIPATION
Participation in the survey is strictly voluntary. The target participant is the household head with age 18 years old and above.

OTHER DETAILS
It is likewise important to note that there will be no monetary giving in exchange of the information during the interview. In addition, should the participants feel uncomfortable for some questions being asked please feel free not to answer any of those questions.

ANONYMITY & CONFIDENTIALITY
WWF Philippines shall treat the information from participants with utmost protection and confidentiality, in compliance with the Data Privacy Act of 2012. Participant's name shall be anonymous during the data processing. All information will be stored in protected and encrypted devices.

CONSENT
I, the undersigned, have been selected as one of the participants for House Hold Survey. I understand the details about the project. I was able to clarify the questions being asked. Hence, I signed this consent to participate voluntarily in the survey.

_____ _____
Name and Signature of Participant Date

SUSTAINABLE TUNA PARTNERSHIP 2
SURVEY INTERVIEW

GENERAL INFORMATION

1. Full Name: _____
2. Address and Contact No.: _____
3. Respondents Cluster:
4. Age:
5. Gender:
6. Marital Status

SUSTAINABLE TUNA PARTNERSHIP
Shark Finning Verification

1. How many years are engaged in Tuna fishing? _____

2. Do you use Fish Aggregating Device (FAD) in tuna fishing?
   - O Yes
   - O No

3. Have you encountered catching sharks during tuna fishing?
   - O Yes
   - O No
   - O If yes please specify: No. _____

4. If yes please identify the species caught in the picture: ____ [Note: Show the picture and record the ID number in the picture].

5. How often do you catch sharks?
   - O Most of the time
   - O Occasionally
   - O Seldom
   - O Others, please specify _____

6. Do sell the whole fish [shark]?
   - O Yes
   - O No

7. If no, what part of the shark is sold?
   - O Fin only
   - O Flesh
   - O Other body parts, please specify: _____

8. If only the fins are taken, what do you do with the other body parts?
   - O Thrown back to the sea live after cutting the fins
   - O Flesh is used as bait
   - O Other please specify: _____

9. Do you know that shark-finning is prohibited by law?
   - O Yes
   - O No

Impacts of the fishery on endangered, threatened and protected species (ETPS)

10. What other species of endangered, threatened and protected species (ETPS) have you caught in FADs?

- O Sea turtle
- O Dolphins
- O Manta rays.
- O Others, please specify _____

11. Which of the following ETP species is most frequently caught in FADs?
    - O Sharks
    - O Sea turtle
    - O Dolphins
    - O Manta rays.
    - O Others, please specify _____

12. What do think are the negative effect of catching ETP species?
    - O Decimation of population
    - O Removal of oceanic ecosystem's apex predator leading to food chain will collapse
    - O Shark finning is wasteful, inhumane and unsustainable.
    - O Others, please specify _____

13. Is there a difference if ETPs are decimated/overfished?
    - O Species extinction
    - O Removal of oceanic ecosystem's apex predator leading to food chain will collapse
    - O Increase of "prey" species
    - O Others, please specify _____

Spatial extent, timing and location of FADs and their interactions with coral reefs/habitat

14. How many FADs do you have? _____

15. Where do you install (place/establish) your FADs if any?
    - O Near the coral reef area
    - O Away coral reef area
    - O Near shore area
    - O Off shore
    - O Others, please specify _____

16. Where do you think is the most effective FAD location/sites?
    - O Near the coral reef area
    - O Away coral reef area
    - O Near shore area
    - O Off shore
    - O Others, please specify _____

17. Do you think installing FADs near coral and coral reef areas have negative effects?
    - O Yes
    - O No
    - O Not aware

18. What possible negative effects do you think will occur?
    - O Possible intrusion of fishers in reef areas
    - O Damaged/lost/abandoned FADs may result to "ghost fishing" in reef areas.
    - O Damaged/lost/abandoned FADs may result to many litters in reef areas causing disruption in coral growth and abundance
    - O Others, please specify _____

Thank you very much for your time responding to this FGD!

SUSTAINABLE TUNA PARTNERSHIP 2
FOCUS GROUP DISCUSSION GUIDE

Spatial extent, timing and location of FADs and their interactions with coral reefs/habitat

1. Profile

Province/ Municipality/ Barangay	Fishing Gear Type	No. of FAD/Gear Units	No. of FADs	By-catch catch composition.	By-catch Lean mos./Ave catch	By-catch Peak mos. & Ave catch	Remarks

2. Location of FADs and their interactions with coral reefs/habitat

Grid map of the fishing ground will be shown to the fishers-participant for them to identify the location of the FADs within the fishing ground, and the location of MPAs and reef areas.

Province/Municipality/ Barangay					
1. Do you think FADs affects coral reefs					
2. What do you think are the negative effects of FADs in coral reef areas					
3. What do you think are the positive effects of FADs in coral reef areas					

Thank you very much for your time responding to this FGD!

Prepared by:

PLUTOMEO M. NIEVES, PhD.
Consultant/Fisheries Technologist

Appendix 2

Focus Group Discussion Attendance in Mindoro Strait and Lagonoy Gulf

Date	Venue	Number of Pax
Mindoro Strait		
June 17, 2022 (PM)	CFLC, Sablayan, Occidental Mindoro	39
June 18, 2022 (PM)	Brgy. Poblacion 1, Santa Cruz, Occidental Mindoro	14
June 19, 2022 (AM)	Covered Court, Brgy. Rumbang, Rizal, Occidental Mindoro	29
June 19, 2022 (PM)	Municipal Compound, Calintaan, Occidental Mindoro	28
June 20, 2022 (AM)	Sitio Igsusu, Tubili, Paluan, Occidental Mindoro	none
June 20, 2022 (PM)	WWF Mamburao Field Office, Brgy. 6, Mamburao, Occidental Mindoro	20
TOTAL		130
Lagonoy Gulf		
July 24, 2022 (PM)	Cluster 1: San Andres, Virac & Bato, Catanduanes CFLC, Codon, San Andres, Catanduanes	30
July 26, 2022 (AM)	Cluster 2: Sagnay & Tigaon in Camarines Sur @Bongalon, Sagnay, Camarines Sur @CFLC, Nato, Sagnay, Camarines Sur	30
June 26, 2022 (PM)	Cluster 3: San Jose and Lagonoy in Camarines Sur CFLC, Sitio Talisay, Brgy. Dolo, San Jose, Camarines Sur	44
July 27, 2022 (AM)	Cluster 4: Presentacion & Caramoan in Camarines Sur CFLC, Sta. Maria, Presentacion, Camarines Sur	49
July 28, 2022 (AM)	Cluster 5: Malilipot and Tabaco City in Albay APTC, Fatima, Tabaco City	57
July 28, 2022 (PM)	Cluster 6: Malinao & Tiwi in Albay CFLC, Sugod, Tiwi, Albay	73
July 29, 2022 (AM)	Cluster 7: Bacacay & Rapu-Rapu in Albay Cawayan Elementary School, Cawayan, Bacacay, Albay	56
TOTAL		**374**

Appendix 3

Household Survey Attendance in Mindoro Strait and Lagonoy Gulf

Date	Venue	Number of Pax
Mindoro Strait		
June 17, 2022 (PM)	Sablayan	39
June 18, 2022 (PM)	Santa Cruz	14
June 19, 2022 (AM)	Rizal	29
June 19, 2022 (PM)	Calintaan	28
June 20, 2022 (AM)	Paluan	none
June 20, 2022 (PM)	Mamburao	20
Sub-Total		130
Lagonoy Gulf		
July 24, 2022 (PM)	Cluster 1: San Andres, Virac and Bato Catanduanes	30
July 26, 2022 (AM)	Cluster 2: Sagnay & Tigaon in Camarines Sur	30
June 26, 2022 (PM)	Cluster 3: San Jose and Lagonoy in Camarines Sur	29
July 27, 2022 (AM)	Cluster 4: Presentacion & Caramoan in Camarines Sur	28
July 28, 2022 (AM)	Cluster 5: Malilipot and Tabaco City in Albay	30
July 28, 2022 (PM)	Cluster 6: Malinao & Tiwi in Albay	27
July 29, 2022 (AM)	Cluster 7: Bacacay & Rapu-Rapu in Albay	29
Sub-Total		203
Grand Total		**333**

Appendix 4

Type FADs used, Number and By-catch Species Composition in Mindoro Strait by Municipality

Prov/Mun. /Brgy	Type FADs used	No. of Units	By-catch species composition.
Sablayan			
Brgy. Buenavista, SitioTabuk	Payao made of buri palm	50	Dorado, Gulyasan, Blue Marlins, Dog Shark, Thresher Shark [Lawihan], Blue shark and Sting Ray
Sta Cruz			
Sta.Cruz , Poblacion 1	Payao (drifting)	30	Malasugi [Sword fish], Pating lawihan (*Alopias pelagicus*), *Carcharhinus amblyrhynchoides* , *Carcharhinus brevipinna*, *Carcharhinus*, and *Alopias vulpinus*
Calinataan,			
New Dagupan	Payao	500+	Pasa-pasa, *Alopias superciliosus*
Poblacion	30 units of drift FADs at 50 meters (local name Buya buya)	30	*Prionace glauca*
Ereron			*Alopias vulpinus*
Concepcion			*Dalatias licha; Eusphyra blochii*
Rizal			
Malawaan	Payao	15	Barakuda, *Prionace glauca*, and Bluemarlins
Salvacion			*Sphyrana mokarran*
Rumbang			Skipjack tuna, black fin tuna
Paluan			
Sitio Igsuso Brgy Tubili			*Alopias Pelagicus, Alopias Superciliosus, Lamna nasus*, *Mobula mobular, Sphyrna zygaena*, and *Rhynchobatus laevis*
Mamburao			
Tayaman	Payao Boya-boya/ parachute type	70 30	Manta ray, *Carcharchina brachyurus* *Alopias vulpinus, Alopias supeciliosus* *Alopias pelagicus, and Sphyrna mokkaran*
Total		**725**	

Appendix 5

Type FADs used, Number and By-catch Species Composition in Lagonoy Gulf by Municipality

Prov./Mun.	Type of FADs Used	No. of Units	By-catch species composition.
ALBAY			
Tabaco	Boya or Payao (Anchored FADs): *Awad* (drifting FADs used at night)	1	Lawihan (*Alopias vulpinus*), Bangkulison(*Isurus oxyrinchus*), Surudan (*Shpyrna mokarran*), Bolinawon (*Carcharhinus longimanus*)
Malilipot	Boya or Payao (Anchored FADs): *Awad* (drifting FADs used at night)	1	Lawihan/sablihan(*Alopias vulpinus*) , Bangkulison (*Isurus oxyrinchus*)
Tiwi	Boya or Payao (Anchored FADs): Awad (drifting FADs used at night)	1	Bangkulison (*Isurus oxyrinchus*), Sablihan (*Alopias vulpinus* and *Alopias pelagicus*)
Malinao	Boya or Payao (Anchored FADs): Awad (drifting FADs used at night)	1	Bangkulison(*Isurus oxyrinchus*), Araduhon (*Rhynchobatus australiae*), Sablihan/lawihan (*Alopias vulpinus, Alopias pelagicus*)
Bacacay	Boya or Payao (Anchored FADs): Awad (drifting FADs used at night)	2	Sablihan(*Alopias vulpinus*, Bangkulison (I*surus oxyrinchus*), *Nebrius ferrugineus, Chiloscylliun plagiosum*
Rapu-rapu	Boya or Payao (Anchored FADs): Awad (drifting FADs used at night)	2	Sablihan(*Alopias vulpinus*, Bangkulison (I*surus oxyrinchus*), N*ebrius ferrugineus, Chiloscylliun plagiosum*
CAM SUR			
San Jose	Tabao (Local term)	1	Lawihan (*Alopias pelagicus)*, Balanakon (*Carcharhinus albimarginatus*) (*Carcharhinus altimus*) Hammer head (*Shpyrna mokarran*) Bangkulison (*Isurus oxyrinchus*)
Lagonoy	Almost all using awad [dFADs]	0	Lawihan (*Alopias pelagicus*), Balanakon (*Carchahinus albimarginatus*), *Carchahinus altimus*), Surudan (*Shpyrna mokarran*)
Tigaon	Tabao (Local term for aFADs)	3	Lawihan (*Alopias pelagicus*), Bolinawon (*Carcharhinus longimanus*), surudan (*Sphyrna lewini*), Pagi /blue spotted stingray (*Taeniura lymma*), pasa-pasa (*Mobula kuhlii*)
Sangay	Tabao (Local term for aFADs)	1	Lawihan (Alopias pelagicus/A. vulpinus), Surudan(*Sphyrna lewini*), Bolinawon (Isurus paucus), bankulison (Isurus oxyrinchus), Pagi /blue spotted stingray(*Taeniura lymma*), Pasa pasa(*Mobula kuhlii*)
Caramoan	Tabao (Local term for aFADs)	26	Araduhon(*Rhynchobatus australiae*), Lawihan (*Alopias pelagicus/Alopias vulpinus*), krusan(*Shpyrna mokarran*), Dalamugon (*Carcharhinus albimarginatus*),Pasa pasa(mobula kuhlii)
Presentacion	Tabao (Local term for aFADs)	2	Lawihan (*Alopias pelagicus/Alopias vulpinus*), Bangkulison (*Isurus oxyrinchus*), Dalamugon (*Carcharhinus albimarginatus*)
CANTANDUANES			
San Andres	Pakaras (local for dFAD/Awad)	1	Lawihan (*Alopias supercilliosus*), Balanakon (*Carcharhinus albimarginatos*), blue shark (*Prionace glauca*), *Carchachinus leucas* (bull shark), Surudan (*Sphyrna lewini*), Pasa-pasa/short fin devil ray(*Mobula kuhlii)*
Bato	Tabao (Local term for aFADs)	2	Sablihan (*A. supercilliosus*), Blue shark (*Prionace glauca*) , Surudan (*Rhynchobatus australiae*)
Virac	Tabao (Local term for aFADs)	3	Balanakon (*Carchahinus albimarginatus*, Lawihan (*Alopias pelagicus)*

Appendix 6

Fisher's Accounts on ETPs encounter during tuna fishing in Mindoro Strait

Municipality	Fishers Accounts

SABLAYAN	Sharks [Dog Shark, Thresher Shark, Blue shark], Blue Marlins and Sting rays are ETPs accidental caught using Tuna Handline in FADs
	Live sharks are released if alive but in case of dead ones, they are finned and the body parts taken for home consumption
	Before, Dog Sharks by-catch are finned, flesh consumed and liver cooked for squalene oil
	Citing of dolphins [Spinner and Bottle nose] and sperm whale in the tuna fishing ground
	Pangulong [small commercial] are FAD owners and SSF area allowed to anchor and fish in the FADs
	Cutlass fish locally known as *liwit* is considered a threat to tuna fishers as they cut the fishing the lines with its sharp tooth resulting to the escape of the catch.
	Tuna fisher can go fishing beyond 15km without restriction
	Sablayan is an open fishing ground without restrictions to other fishers in other municipalities or province
	Tuna fishers disclosed that they have no intention of purposely catching sharks for fins only.
	Pandan island MPA [marine fish sanctuary]
	Dolphins conflict with SSF observed resulting to loss of catch & fishing gear damage especially when fishing for tulingan [bonito] at gulyasan .
	14. At present there are no buyers of shark fins; SSF's are aware the all sharks are prohibited and catching and selling is punishable by fine and imprisonment
STA, CRUZ	Except the head part of shark, all body parts are used and consumed as food fish. Shark fins are also taken but selling or trading is not fully disclosed in as much as ALL SHARKs are prohibited and protected species
	Sharks are considered by-catch or mostly unintended species caught during tuna fishing with or without FADs.
	Tuna fishers are aware the sharks are protected species but do not know which species are ETPs
	Dolphin [Spinner and Bottle Nose] conflict with SSF: compete with catch and damage gears
	Kitang [Multiple long line] was cited to frequently catch sharks and sting rays during the months of Dec. - Feb.
	About 60 - 80 kgs Thresher Sharks are sometimes caught
	FADs are installed 25miles from shore - where SSF fish and take shelter
	There are more sharks in APO Reef
CALINTAAN	Locally, *Payao* is stationary while *Boya* is drifting structure; One (1) fisherman have 4 payao [costing about @PhP 10,000/unit] to anticipate loss.
	Buli and *nipa* leaves is used in FADs, coconut leaves appear to be smells good for fishes
	Feb-June posibility of catch shark in tuna handline fishing
	The possibility of catching sharks during tuna fishing could be explained by the fact that they also swim and feed at the same depth [35-60m] with tunas, they also predate on tunas
	Dolphins' are attracted to light where fish also aggregate - provide better opportunity for feeding frenzy for dolphins [Spinner and Bottlenose]
	Basnig [<3 GT] are used in catching fish that aggregate in FADs [Payao]
	Three (3) barangays in Calintaan have MPAs
	Tuna handline fishing makes use live bait: *Squid* at night time and *Alumahan* in daytime fishing
	Before there is a market for shark fins
	Three (3) barangays [New Dagupan, Ereron and Concepcion] in Calintaan are nesting ground ng pawikan [Marine turtles]
	The increased number of marine turtles [*pawikan]* at dolphins, are now creating conflict with fishers.
RIZAL	Catching shark happens anytime whenever they shark smell the bait
	No coral reefs in the area of Rizal

	Sharks' fins are keeps and sold when buyer is available
	There are concrete artificial reefs [ARs] in the area
	If the shark is exhausted and dying, it the time to haul the shark for safety reason
	Buyer of shark and fins are from San Jose and Sablayan
	FADs are deployed 2.5 to 3 miles from the shore.
	Damaged FADs floats and are carried by the wave and sometimes taken by other fishers
	dFADs [Boya-boya] is allowed near the reef area
	Basnigan are used to catch/harvest fish in FADs
	In February, whale citing occurs but dolphins are year-round fishers' problems
	Reason for dolphin's conflict: increase in dolphin population due to protection, [forage] fish decreased while there was an observed increase in fishers' population.
	Sharks are caught at 300meter depth, all body part are utilized.
	A 30kgs of thresher shark was caught by tuna fishers
PALUAN	October month of encounter during tuna season
	Approx. 500 to 1000kgs shark,
	In case of Dog shark, the liver and the fins are the primary parts taken but other body parts are included. Fins sold to TAIWANESE at JAPANESE buyer in Mamburao at PhP 900/kg [before]
	Several species of fish are caught in FADs; deployed in about 2-3 miles away from coral reef; the biggest tuna caught is 120kgs while smaller ones weigh about 40-50kgs
	Shark fins are secretly dried, store and sold. Buyers also requires specific measurement of fins cut to make it saleable
MAMBURAO	At least one (1) chance a year to capture of sharks
	Squid bait will catch ORCA; Sting ray and dolphin are usually entangled in FADs and Handlines
	Payao's are installed 5-100 miles away from shore
	Dolphins disturbs the fish and squid aggregation at nighttime making live tuna bait problematic to get.
	Bottlenose dolphin damages even the FADs when forage fish is not enough to satisfy meal for the day
	Dolphins are feeding on "gulyasan"
	Some species of sharks /Orca are too dangerous, they even damage boat hull and propellers
	FADs deployment is very far from coral reef besides they only use "buli" and coconut leaves
	Bahura [coral reef] 10 is the name for nearshore reef areas

Appendix 7
Fisher's Accounts on ETPs encounter during tuna fishing in Lagonoy Gulf

Municipality	Fishers Accounts
Tabaco	NO comment

Malilipot	If they accidentally catch shark, they take the whole fish for economic use [i.e., fins for sale, body parts/meat for food]
Tiwi	NO comment
Malinao	Sharks bites the bait intended for tuna, catching shark is therefore unintended
	Fishers are aware that endangered, threatened and protected (ETP) species like marine turtles, manta rays and sharks protected and catch is illegal.
	They cut lines to release the shark if they if the feel it's a shark but sometimes they take the whole fish to make up for their expenses
	There is a buyer in Malinao area.
Bacacay	No rules and regulations for FADs
	Should they catch shark they make full use of all its body parts.
Rapu-rapu	No rules and regulations for FADs
	Should they catch shark they make full use of all its body parts.
San Jose	*Awad* or drifting FADs is used at night. To attract the fish, lightings are installed
	They do not own FADs; but are usually allowed to fish in FADs owned by other fishers
	They believe there still large population of sharks in LG, the reason why they keep on biting bait intended for tuna
Lagonoy	Sharks are caught in FADs during tuna fishing
	If they feel it's not tuna taking their bait they cut the line, but in case no tuna is caught, they will take the shark [whole fish] to at least pay-off the fishing expenses for the day.
	Sometimes FADs are lost
Tigaon	There is a greater chance of catching sharks outside the gulf than inside the gulf
Sangay	There are about more than 50 units of FADs in the fishing ground but small-scale tuna fishers but they are allowed to fish. Damaged or detached FADs drifting in the sea and found by other fishers are not returned to the owner.
	Accidentally detached FADs and found by other fishers are not returned to the owner.
	Should they catch shark they make full use of all its body parts: fins are sold in Tabaco or Naga City.
	Catching shark is also dangerous besides the price of shark meat is comparative low for a dangerous catch.
Caramoan	Shark is caught by accident not intended
	Should they catch shark they make full use of all its body parts for food and the fins are sold
	Reef is important in fishing area to have good catch, the nearer the ground the better
	Nearest FAD is 6.5-7km from the shore, the usual distance of deployment is 15km.
	They prefer FADs in tuna fishing
	"Tiktik" are gillnetters that exploit other FADs without permission from the owner that causes damage to the FAD or loss of the same
Presentacion	Shark is caught accidentally and unintentionally.
	"Tiktik" are FAD destroyers
	Compressor fishing with obnoxious substance affects fishing in many ways.
San Andres	Offshore FADs affect small scale FADs inside LG
	"Surudan" is the most expensive shark fin
	Sometimes, when pasa-pasa (Giant manta/Pelagic Manta Ray) (*Mobula birostris*), Shortfin Devil Ray (*Mobul kuhlii*) got entangled to the fishing line, they just cut it for safety reasons.
	No limit in deploying FADs
	Because of strong current in the gulf, FADs site for deployment is carefully selected
	Dolphins are also causing problems to fishers
	Blue shark is very dangerous to catch, there are only 1-2 chances of catching sharks in a year
Bato	Virac, Bato, Baras area are saturated with FADs since there are not regulations in place or limitation in number and ownership.
	30km away from MPA, FADs deployment
Virac	July to Nov Start tuna season when sharks are also caught
	50Km distance of FADs from MPAs

Appendix 8

FGD's Output on the issue about FADs and Coral Reef in Mindoro Strait

INQUIRY	SABLAYAN	STA CRUZ	CALINTAAN	RIZAL	PALUAN	MAMBURAO
Do you think FADs affects coral reefs	NO: [1] FADs are installed 15 nautical miles from the shore of Sitio Tabuk; [2] Coral Reefs are located in 1000 m away from FADS; [3] Distance of FADs from APO Reef is 4 NM.	NO: [1] FADs usually installed 12 to 60 miles away from reef areas. [4 types of FADs used" aFADs, usual type with float, anchor line and anchor made of big stone or concrete container + coconut /buri leaves; dFAD with floatation and coconut/buri leaves underneath; dFADs parachute type/floatation is made of leather and the commercial FADs from BFAR for offshore]	NO - malayo na sa coral ang arya ng mga payao; 50meters depth in the area no more corals available in the municipal water	NO since Payao are installed away from reef areas and used as mooring /anchorage of tuna fishers	NO: FADs do not damage coral reefs	No negative to FADs
What do you think are the negative effects of FADs in coral reef areas	Fisher thinks that FAD has not negative effect on coral reef since they are made of rope and "Buri palm leaves" which is an organic material that is biodegradable	Fishers feels FADs have not negative effects on coral reefs	NO negative effect: bahura meron sa labas na ng municipal water: damage ng bagyo, bottom set gill net can catch sharks	NO	No negative effect	No negative effect
What do you think are the positive effects of FADs in coral reef areas	1. FADS serve as anchoring station day and night while fishing [H&L fishers]; 2. Fishing area where to fish [catch available fish size small and big].	Fisher is on the opinion that Coral Reefs have positive effect on FADs because coral reefs are spawning ground of fishes and squids. FADs serve as mooring buoys and therefore will not harm corals; FADs can also be the source of recruits of fishes feeding on FADs which attracts bigger-size predatory species	YES, possible positive effect on recruitment	Attracted fish and in time stays in reef area	No idea	positive to coral reefs to FADs

Appendix 9

FGD's Output on the issue about FADs and Coral Reef in Lagonoy Gulf

ALBAY

INQUIRY	Tabaco	Malilipot	Tiwi	Malinao	Bacacay	Rapu-Rapu
Do you think FADs affects coral reefs	No. FAD location is far from reef areas [about 5 km away from coral reefs]	No. FAD location is far from reef areas [about 10 km away from coral reefs]	No. FAD location is far from reef areas [about 10-15 km away from coral reefs]	No. FAD location is 15 km away from coral reefs]	No since FADs are deployed away from CRs.	No. FADs were deployed at the middle of LG, therefore cannot affect CRs.
What do you think are the negative effects of FADs in coral reef areas	NONE. since FADs are deploy away from reef areas	With the distance of 10 km., we believe it will not affective coral reefs negatively	With 10-15 km away from coral reefs, no negative effect will occur	No idea	None	None
What do you think are the positive effects of FADs in coral reef areas	NO IDEA: The facilitator explained the connection b/w coral reef & FADs	NO IDEA: The facilitator explained the connection b/w coral reef & FADs	Fishers believed that there is no connection whatsoever: FADs and Coral reef ecosystem	NO IDEA	Yes: Because CRs is the spawning ground for small fish the shelter in FADs	NO IDEA

CAMARINES SUR

INQUIRY	San Jose	Lagonoy	Tigaon	Sangay	Presentation	Caramoan
Do you think FADs affects coral reefs	No. FADs were deployed away from CRs. But when deployed 2-3kms away from Coral Reef there is a possibility to affect or damage due to anchor ropes which may get entangled with the corals	No. FADs are deployed aways from Coral Reefs	No. FADs are deployed aways from Coral Reefs	No. FADs are deployed aways from Coral Reefs	No [7km distance of deployment will not affect Coral Reefs	Yes, if FADs are deployed near the Coral Reefs. [6.5 -7km away from shoreline the nearest FADs, and 15km the farthest FADs
What do you think are the negative effects of FADs in coral reef areas	None	None	None	None	No, may be minimal if in case.	Yes, minimal damage, affects water quality, if FADs are near Coral Reefs.

What do you think are the positive effects of FADs in coral reef areas	NO IDEA	NO IDEA	NO IDEA	NO IDEA	Yes, more tunas are caught due to coral reefs which is connected to the whole aquatic food chain	Yes, Good reef condition mean good fish catch

CATANDUANES

INQUIRY	San Andres	Virac	Bato			
Do you think FADs affects coral reefs	No because FADS are deployed far from Coral Reefs]	No because FADS are deployed far from Coral Reefs	No because FADS are deployed far from Coral Reefs			
What do you think are the negative effects of FADs in coral reef areas	No because FADS are deployed far from Coral Reefs	No because FADS are deployed far from Coral Reefs	No because FADS are deployed far from Coral Reefs]			
What do you think are the positive effects of FADs in coral reef areas	Yes, but we cannot explain it the connection	No Idea	No Idea			