

MONITORING ON CATCH COMPOSITION OF SURIT FISHING

Myriflor S. Avenido¹, Liezel Abarca², Jesel Caresusa³, Archimedes Macuray⁴,
 Hermanita Orpina⁵, Julie Grace U. Sullano⁶

¹ Surigao del Sur State University
 Cantilan, Surigao del Sur, Philippines 8317
 myriflorsa88@gmail.com +639088149380

ABSTRACT: Fishing is one of the sources of livelihood in Cantilan Surigao del Sur. Thus, Surit fishing is one of the methods used in catching fish. Surit is usually used during anchovy season, but there are information that say other marine species are caught. This information has neither primary nor secondary data available thus; the purpose of this research was to determine the catch composition of Surit Fishing gear in the municipality of Cantilan, Surigao del Sur. Furthermore, it sought to determine the perception of Surit Fishing operators and workers. Based on the qualitative and quantitative analysis of the data gathered, it was found out that Surit Fishing is an effective way in catching fish, which is beneficial on the part of operators. Although, the data shows that operators were able to catch large quantity of fish, the researchers suggest to limit the light bulbs, because too much light bulbs will attract a lot of fish especially juvenile fish. Furthermore, catch composition of Surit Fishing by respective operators based on the data gathered is made up mostly of squid. The data also reveal the capacity of Surit doesn't matter. It matters in areas where fishing unless catch fish. Based on the data gathered it was recommended that the fish workers and Bureau of Fishery and Aquatic Reform must continue to implement Republic Act 8550, of the Philippine Fisheries Code of 1998, which is an act providing for the development, management and conservation of the Fisheries and Aquatic Resources. Moreover, actions must be taken for those who have been using blast or dynamite during Surit Fishing.

Key Words: Surit Fishing, Catch Composition, Fishing Gear, Squid, Anchovy

1. INTRODUCTION

Fishing activities have a direct impact on target species catch and also on the whole marine ecosystem. It affects habitats, biodiversity and productivity. In particular, bottom trawls are used in catching marine life that live on the seafloor and have a large impact on the habitat [1]. In this context, an increasing amount of scientific effort has been devoted in recent years to studying the effects of fishing activity on the ecosystem. Laws and regulations have also been implemented to regulate fishing operation and to scale the ecosystem. There are also a lot of information, models and recommendations on the most appropriate ways to manage a particular fishery, yet global fish stocks are still on the decline and the trend seems set to continue despite the best efforts of scientists to stem the tide [2 - 6].

Looking into the Philippine scenario, legislators have enacted laws or acts providing for the development, management and conservation of the fisheries and aquatic resources. The Republic Act No. 8550 known as the Philippine Fisheries Code of 1998 states that the state shall ensure conservation, protection and sustained management of the country's fishery and aquatic resources [7].

Surit fishing as it is locally known in Cantilan, Surigao del Sur, Philippines, has been allowed in the municipal water to catch the *bolinao* or anchovy as the target species. This kind of fishing gear based on RA 8550 is classified under marine species. The used of Surit as a fishing gear is allowed since the target species is only *bolinao* or anchovy, but fish workers have observed that other marine species are caught due to its operating activities and gear accessories used. Wherein these activities and gears can caused an enormous negative impact on coastal environment. But, this information has neither primary nor secondary data available. Thus, the purpose of the study was to examine and determine the catch composition using *Surit*. Likewise, this study would like to undertake the fishing operation within the municipal water. The researchers also would like to determine the lived experience of the fish workers and operators who do *Surit* Fishing.

This study was anchored to the concept of “Ecosystem-Based Fishery Management” (EBFM) which examines current fishery management and practices and postulates that an improved understanding and management of stock interactions, stock – prey relationships and stock habitat requirements will result in more sustainable fisheries. A prerequisite is the ability to control and account for harvests and fishing effects by controlling overfishing and reducing bycatch and impacts of fisheries on ecosystem [8]. Furthermore, EBFM considers geographically specified fisheries management that takes account of knowledge and uncertainties about and among, biotic, abiotic and human components of ecosystems, and strives to balance diverse societal objectives. Such an approach will address human activities and environmental factors that affect an ecosystem, the response of the ecosystem and the outcomes in terms of benefits and impacts on humans. A distinguishing feature of an ecosystem approach is an emphasis on protecting the productive potential of the system that produces resources flow. For an ecosystem that is already degraded, the goal becomes one of rebuilding or restoring the ecosystem [9].

The diagram below portrays the basis for determining the

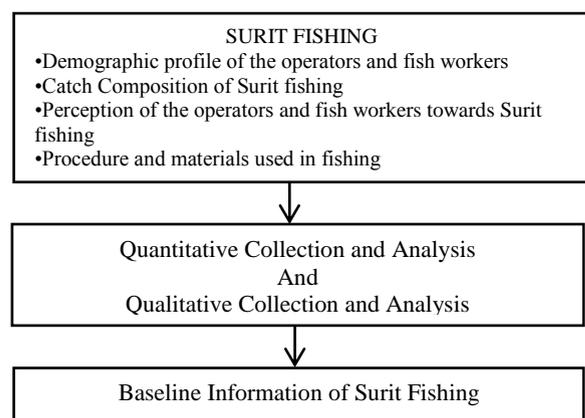


Figure1. Schematic Diagram of the Study

catch composition of *Surit* Fishing gear in Cantilan Surigao del Sur. The schemes are placed according to their respective function and flow.

As shown in the diagram, the first component presents the Profile of *Surit* Fishing. This includes the demographic profile of the operators and fish workers of the said fishing gear and their actual fishing experience/perception. It also includes the catch composition of the fish such as its length, weight, fish identification and type of species. Lastly, it includes the materials, strategies and procedure in using *Surit* for Fishing.

The second component presents the process of acquiring data through mixed qualitative and quantitative methods. In the qualitative method, the researchers conducted an interview. Through this, the researchers were able to acquire data such as the operators and fish worker's demographic profile and their evaluation and perception towards their fishing activities. The researchers were also able to clarify the data gathered and ask questions for further understanding of *Surit* fishing – its gears and procedures. While in the quantitative method, the researchers used survey questionnaires to identify the catch compositions in every *Surit* fishing gears – according to its operators, type of gears, length and weight.

The third component presents the result of the study which the data and other information gathered will serve as the baseline information about *Surit* fishing in Cantilan, Surigao del Sur.

2. MATERIALS AND METHODS

For proper assessment of *Surit* Fishing in the municipal water of Cantilan, Surigao del Sur, there was a need to understand not only its catch composition but also the demographic and socioeconomic status and dynamics of fish workers and operators. The data were gathered through the use of semi-structured interview, in which it was preceded by observation, and informal and unstructured interview in order for the researchers to develop a keen understanding of the topic of interest. Three types of questionnaires were utilized. The first questionnaire was used to interview the *Surit* operators and fish workers. The second questionnaire served as a guide in identifying the catch composition of *Surit* fishing when the fishermen hauled or towed fishes as scheduled and provided sample data. Efforts were taken to ensure that the information collected was as accurate as possible.

There were 36 respondents, 15 of which were *Surit* Fishing Operators and the rest were Fish workers. Most of the respondent's ages 30 to 34 and are already married. All of them are males because *Surit* fishing, as a medium for catching fish, requires full strength and energy in which sometimes strength and energy declines as people aged. In terms of their educational attainment, most of them are high school level because according to them they have the financial difficulty that requires them to work rather than to pursue a scholastic path. Most of them reside in Barangay Lininti-an wherein the primary source of income of the residence is fishing, thus fishing is the primary occupation of the respondents because they earn more than farming.

3. RESULTS AND DISCUSSION

Qualitative Data

The information below is a summary of all that was taken from interviews and general comments.

All of the respondents or 100% (36) answered that using *Surit* Fishing is very advantageous. The respondents said that engaging in this kind of fishing activity would enable them to support the basic needs of their family. On the average, the workers and operators were able to generate 30, 000 to 60, 000 thousand pesos in every haul. The most share system they used, is that all fish workers get an equal share with a share going to the boat and after fuel expenses. The fish operators got the biggest share of income.

This fishing activity is also beneficial for them especially when the anchovy is in seasoned and is very abundant. This is because anchovy is marketable to the local consumers and other fishermen who use anchovy as their bait.

Here is an excerpt from the interview of the respondents' evaluation towards *Surit* Fishing:

Fisher 1: "*Dako gajod na tabang ang surit fishing sa amo panginabuhian kai makatabang kini pag suporta sa adlaw-adlaw namo na mga panginahanglanun sa among pamilya.*" He said that engaging in this kind of fishing activity would enable them to support the basic needs of his family.

Fisher 2: "*Nakatabang karajaw ang surit fishing sa amo kay tungod ni ini nakapaskwela ako sa ako mga bata.*" He said that he is able to finance the educational needs of his children through *surit* fishing as his livelihood.

Fisher 3 "*Marajaw ang surit fishing kay dako ang amo ginansya na makuha*". He said that he can gain more profits through *surit* fishing.

The operators' and fish workers' were also asked towards their perception in using *Surit* for fishing. The question asked was in a form of open-ended question, wherein respondents were given opportunity for them to answer the question in their own words.

The data shows that 88.89 percent of the respondents perceived that using *Surit* for fishing is very sustainable economically and environmentally. Thus, they need to continue *Surit* Fishing because the profit they get from *Surit* Fishing was able to provide their daily needs. It also enables them to finance the educational needs of their children.

Furthermore, fisher 1 said that they want to continue using *Surit* for fishing since it provides environmental sustainability because it cannot affect or it cannot destroy the coral reefs for it only uses net and lights. On the other hand, 11.11% of the respondents perceived that *Surit* Fishing may not be dangerous but they still consider to discontinue it because some operators or fish workers opted to use dynamite or blast fishing to stun or kill schools of fish for easy collection. This practice destroys the ecosystem since the explosion will destroy the underlying habitat such as coral reefs that support the fish. The others also decided to discontinue using *Surit* because they have experienced a traumatic incident, when a big whale was caught off by the *Surit* they're using. Others may have decided to stop using *Surit* but reasons were due to other factors and not on the methods and process of *Surit* Fishing itself.

The respondents were asked to estimate the number of kilos of catch per day, since sometimes they are able to haul 2 to 3 times every night per peak season.

Table 1. Maximum No. of Kilos of Catch as Perceived by the Fish workers and Operators

MAXIMUM NO. OF KILOS	F	%
100 kilos	1	2.77
200 kilos	3	8.33
300 kilos	1	2.77
400 kilos	14	38.8
500 kilos	17	47.22
50 kilos	36	100%
TOTAL	36	100

The table above shows that 47.22% of the respondents catch 500 kilos of fish per day. Meanwhile 2.77% of the respondents catch 300 kilogram of fish per day and another 2.77% catch 100 kilogram per day. On the other hand, when it is off season all of the respondents said that they catch 50 kilos of fish per day.

Procedures and Fishing Accessories Used in Surit Fishing

The respondents narrate the procedures and gears used in *Surit* Fishing. The respondents said that there are 6 fishing gears used by *surit* fishers namely: black net, rope, bamboo stick, generator and bulb.

Table 2. Fishing Accessories Used in Surit Fishing

Fishing Gears	Description
Black Net (fishing net)	A net used for fishing made from fibres woven in a grid-like structure. Fishing nets are usually meshes formed by knotting a relatively thin thread. These large nets are designed to be towed behind the boat.
Rope/Hauler	The Fisherman is able to pull the fishing gear aboard by turning the handle of the hauler, where the rope is attached. Through this, the effort needed to haul the fishing gear can be made less.
Generator	Serves as a source of electricity.
Light Bulb/ Fishing light attractor	A fishing aid which uses lights attached to the <i>Surit</i> to attract both fish and members of their food chain to specific areas in order to harvest them. locally, <i>surit</i> fish workers and operators use dynamo as their fishing light attractor.
Bamboo Sticks	Serve as wings of the <i>Surit</i> , tied by rope together with the black net.

The process of using *Surit* for fishing, is that, first, the fish workers and operators arrive at exactly 5 pm then they will find an area where there are more fish. At 7 pm, they switch on the generator to allow light, so that fish will come over near the boat. The fish workers then observe if there are lots of fish below the light attractor. If so, the black net will be dropped. Next, the light at the side will be turned off, but the light bulb at the centre will remain. This will enable the fish to gather at the centre. After that, the fish workers will gradually untie the rope on each side. Lastly, the fish workers roll the rope and pull each side of the black net to the centre area to collect the fish they caught.

As observed in *Surit* Fishing there are two types of lights used: the dynamo and the petromax. The dynamo is a type of light which needs a generator as a source of electricity of light while petromax is traditional and needs kerosene. The respondents compared which among the two is more effective and is currently used. They revealed that the use of dynamo is more efficient with less hassle than the use of petromax.

Quantitative Data

This section of the results examined the biometric data or the catch composition collected from the different *Surit* in different barangays in Cantilan, Surigao del Sur. The type of data collected included the name of the fish or its identification, the length and its weight. After every haul, the researchers were able to obtain a sample size.

Catch Composition of Surit Fishing

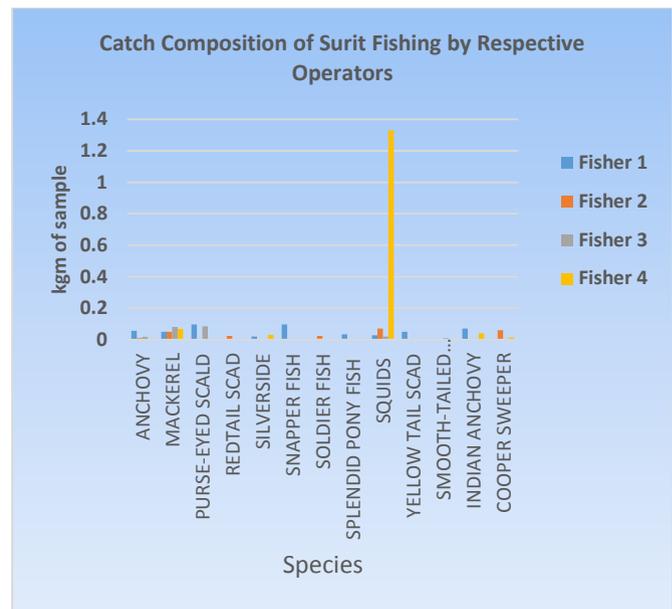


Figure 2. Catch Composition of Surit Fishing by Respective Operators in terms of Fish Identification, Length and Weight

Based on the data gathered, the results were graphed (Figure 2). It presents the type of species caught by using *surit*, wherein Fisher 4 caught 1.3 kilograms of squid. *Surit* is known as a fishing gear to catch anchovies. However, based on the data, squid has the biggest number of those using *surit* because according to the fisherman, the catch composition of *surit* varies from the weather and the areas where they were caught.

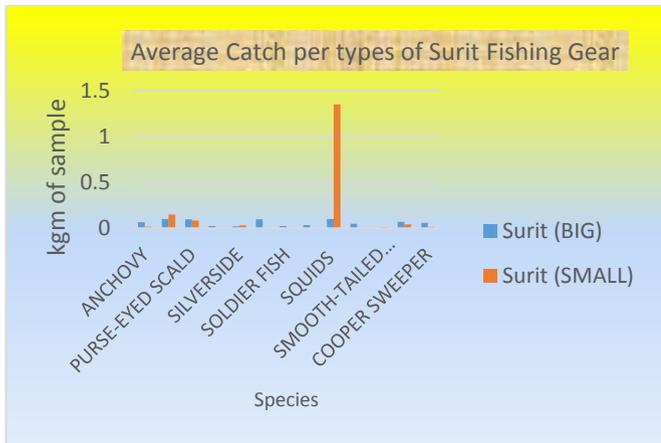


Figure 3. Average Catch Per Types of Surit Fishing Gear

The type of gear classification whether it is small or big in size and its catch composition was also analyzed. Based on the data gathered, small *surit* has the biggest fish catch than the big *surit* but the big *surit* has more type of fishes caught than small *surit*. Among those that are caught, the squid has the biggest catch with 1.3 kilograms. It reveals that the capacity of the *surit* doesn't matter but on the areas where one catches fish. Based on the data, the big *surit* caught 0.7 kilograms of samples compared to the 1.7 kilograms of samples caught using the small *surit*. One of the differences of big and small *surit* is capacity. A small *surit* has black net with 30 rounds of length and 3 fathom of depth. While big *surit* has 60 rounds of length and 9 fathom of depth. Another difference is that a small *surit* has six lights with 9 watts and 220 volts while big *surit* has 10 lights with 9 watts and 220 volts. Based on actual observation and what fish worker said, the fish catch composition of both small and big *surit* varies not only due to their own capacity but also of the condition of the weather, the season and the areas where they catch fish. However, the big and small *surits* also have similarities. The ropes used in the two *surits* have the same length and the operation of the two has the same process.

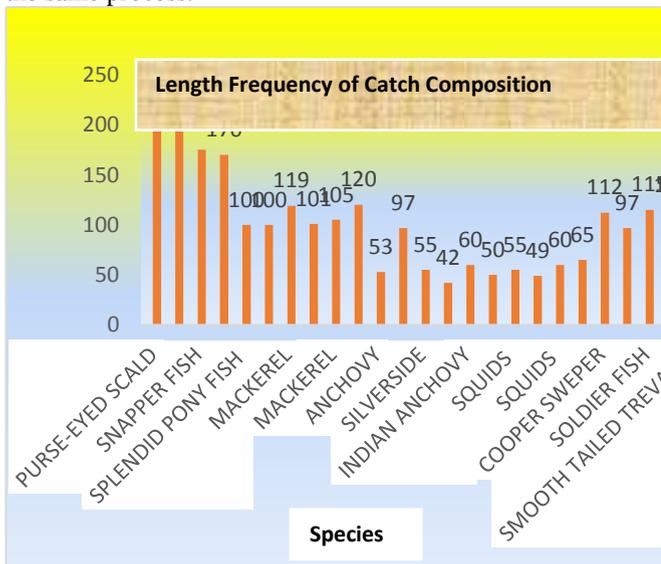


Figure 4. Length Frequency of Catch Composition

Based on the data gathered, the following results were graphed. The species were measured in centimetres. These species were considered as a mature species except the squid because the squids were only 60 cm and they will still grow. Among all the species, smooth tailed trevally is the longest species with 210 cm and this species is considered as matured species. The smallest species caught by the *surit* is the silverside. This species is also considered as matured species because based on the book of fishes of the Philippines by Genevieve Broad 2003, the silverside family has a size range of 4 in, or 10cm.

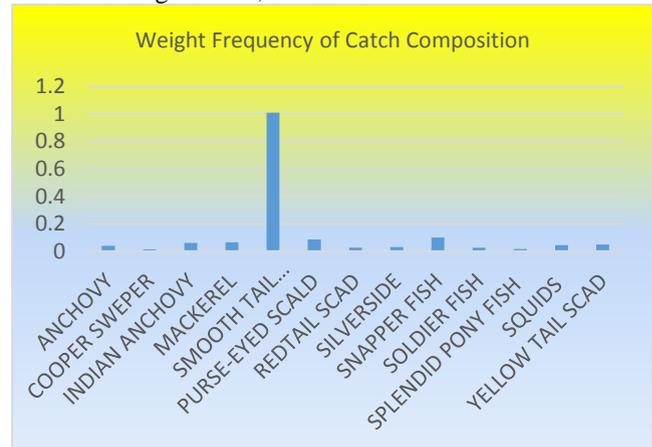


Figure 5. Weight of Frequency of Catch Composition

Based on the data gathered, the following results were graphed. It presents the different species caught using *surit* and the number of kilograms of the samples. Among all the species, smooth tailed trevally has the heaviest weight with one kilogram. This species is considered as a matured species based on the book, Fishes of the Philippines by Genevieve Broad 2003. The smallest weight caught using *surit* is cooper sweeper which is also considered as matured fish.

4. CONCLUSION

Surit Fishing is an effective way in catching fish. Based on the data it is beneficial on the part of the fish workers and operators. Thus, all of the respondents sell their fish to trading vessels, fish vendors and other fish workers. This shows that *surit* fishing plays a vital role in sustaining the livelihood of fishers in Cantilan, Surigao del Sur. Investing in this fishing activity will generate a big amount of income especially during peak season and is a big help to the economic development of the fish workers.

During peak season, *surit* fishers and operators were still able to catch a large quantity of fish, which could lead to overfishing. Thus, overfishing has been determined as the leading cause of ecological extinction in coastal ecosystems. It was also observed that undersized or juvenile fish were caught while using *surit*. The catching of juvenile fish of a target species can lead to both growth and recruitment of overfishing and can thus lead to a decline in the resource of interest or of that type of fish. Thus, the researchers would like to recommend to the fisher workers and operators to limit the light bulbs, because too many light bulbs will attract a lot of fish that would lead to overfishing. Furthermore, the Bureau of Fisheries and

Aquatic Resources may address this problem and suggest other means to get rid of incidents like this.

Catch composition of *surit* fishing by respective operators based on the data gathered, is made up mostly of squid. There is a higher difference in the fish caught using different *surit* fishing gear. Moreover, the data reveal that capacity of *surit* doesn't matter. It matters in areas where fishing workers catch fish.

On the length frequency of the sample, it was found out that most of them catch matured fish base on the measurement of maturity of fish. The squids were not considered as matured species because they can still grow larger. In terms of weight, smooth-tailed trevally was the heaviest species that caught using *surit* while copper sweeper was the lightest that was caught using *surit*.

The researchers would like to recommend that the fish workers and BFAR must continue to implement Republic Act 8550, of the Philippine Fisheries Code of 1998, an act providing for the development, management and conservation of the Fisheries and Aquatic Resources. Moreover, actions must be taken for those who have been using blast or dynamite during *Surit* Fishing. The Bureau of Fisheries and Aquatic Resources must have a close monitoring and strict implementation of R.A. 8550 as they adhere to their mission of Fish Forever, a program which gives hope to the world's oceans and those who depend on them.

5. ACKNOWLEDGMENT:

The authors would like to thank Surigao del Sur State University Cantilan Campus Research and Development Program and also the Bureau of Fishery and Aquatic Reforms – Cantilan for the warm support in helping the authors in their search for knowledge.

6. REFERENCES:

- [1] Sanchez, P., Sartor, R., & Recasens, L. "Trawl catch composition different fishing intensity periods in two Mediterranean demersal fishing grounds." *Scientia Marina*. **74**. 765 – 773. (2007).
- [2] Anderson, O. "A qualitative and quantitative measurement of the small-scale snapping fisheries of the Las Perlas Archipelago, Panama." Retrieved August 15, 2015 at http://www.stri.si.edu/sites/darwin_initiative/PDFs/OAnderson.pdf. (2005)
- [3] Pauly, D. and Agüero, M. "Small-scale fisheries in the neotropics: research and management issues." In Agüero, M. (ed.) Contributions to the study of artisanal fisheries in Latin America. ICLARM *Conference Proceedings*, **35**, 113. (1992)

- [4] Pauly, D., Mines, A.N. and Navaluna, N.A. "Catch and effort in the small-scale fisheries." In Pauly, D and Mines, A.N. (eds.) Small-scale fisheries of San Miguel Bay, Philippines: biology and stock assessment. *ICLARM Technical Reports*, **7**, 124. (1982)
- [5] Ruttenberg, B.I. "Effects of artisanal fishing on marine communities in the Galapagos Islands." *Conservation Biology*. **15(6)**, 1691-1699. (2001).
- [6] Gill, D. "Socio – economic profile of fisheries in the Grenadine Islands." *Centre for Resource Management and Environment Studies*. University of the West Indies, Faculty of Pure and Applied Science, Cave Hill Campus, Barbados. (2007).
- [7] Verceles, L.F., McManus LT, Aliño PM. "Participatory monitoring and feedback system: an important entry towards sustainable aquaculture in Bolinao, northern Philippines." *Sci Diliman*, **78- 87**. (2001).
- [8] Ward, T., Tarte, D., Hegerl, E. & Short, K. "Ecosystem-based management of marine capture fisheries." *World Wide Fund for Nature Australia*, **80**. (2002.)
- [9] Christie, Patrick, David Fluharty, Alan White, Liza Eisma-Osorio, and William Jatulan. "Assessing the feasibility of ecosystem-based fisheries management in tropical contexts." *Marine Policy* **31**, 2007: 239-250.

Surit Fishing Gear

