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Group Seine Operations of Philippine Flagged Vessels in High Seas Pocket 1 (HSP1)

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ABSTRACT

This paper reports the operations of Philippine group seine operations in High Seas Pocket 1 based on Observer reports in 2019. It covers thirty-five (35) operational catcher vessels during the period January-June and October-December 2019. It describes catch, effort and operation (catch-per-unit-effort, species and size composition, number of catcher and support boats, number of sets and the number of days) of the fleet in high seas pocket 1.

I. Introduction

High Seas Pocket No. 1 (HSP1) was closed to purse seine fishing for 2 years effective January 1, 2010 as a result of the implementation of Conservation and Management Measure 2008-01 (CMM 2008-01) adopted by the Western and Central Pacific Fisheries Commission (WCPFC). The CMM is intended to reduce fishing mortality of bigeye and yellowfin tunas. HSP1 is bounded by the exclusive economic zones or EEZs of Federal States of Micronesia, Republic of Palau, Indonesia, and Papua New Guinea.

In March 2012, the 8th Regular Session of the WCPFC adopted CMM 2011-01 as a temporary extension of CMM 2008-01 and giving access to Philippine traditional fresh/ice chilled seining vessels operating as a group in HSP1 until February 2013. Subsequently, CMM 2012-01 provided the measures for this fleet in the high seas until February 2014, CMM 2013-01 for 2014-2017, CMM 2017-01 for 2018 and CMM 2018-01 for 2019-2021. The measures involved several conditions including access limit to 36 catcher fishing vessels, mandatory use of automatic location communicator (ALC) and regional observer onboard.

Consequently, Fisheries Administrative Order 245 (FAO 245, 245-1, 245-2, 245-3 and 245-4) was issued by the Department of Agriculture through the Bureau of Fisheries and Aquatic Resources (BFAR) to prescribe regulations and implementing guidelines on the operations of 36 fishing vessels in HSP1. In addition, Fisheries Administrative Order

240 (FAO 240) was adopted for the implementation of the National Fisheries Observer Program (NFOP) covering high seas. Further, Fisheries Administrative Order no. 241 (FAO 241) was issued to strengthen VMS operations in the high seas.

This report was based from the reports of Observers, covering the catch of 35 vessels that were able to conduct fishing in HSP1. The fleet opted to operate only for 9 months (January-June; October-December) in adherence to paragraph 14 of CMM 2018-01.

II. Methods

A. Catch Estimation

Observers total catch estimates were derived from two methods. The main procedure was made by counting and estimating the capacity of brails as fish catch was transferred from the bunt to wells or fish holds of awaiting carriers. The other method was based on capacity and fullness of wells/fish holds. Catch rate was estimated as mT/fishing day. In general, only one set was made in one fishing day. In the brail count/capacity method, total catch was estimated using the following method:

$$\begin{aligned} \text{Volume (V)} &= \pi r^2 h \\ \text{Brail capacity} &= \text{Volume} \times 80\% \\ \text{Where;} \\ \pi &= 3.14 \\ h &= \text{Brail height} \\ r &= \text{Brail diameter (d)/ 2} \end{aligned}$$

The volume of fish catch was estimated at 80% of the volume of the brail to account empty/water space. By using this method, a margin of +/- 2% error was observed (dela Cruz, 2010).

B. Catch Sampling

Spill sampling using the sampling bin specified by SPC was used as sampling protocol. The bin has a capacity of around 300-500 kilograms, depending on the size and species of fish caught. Samples were sorted according to species whenever possible and weighed to the nearest 0.1 kg. The lengths of all tunas and mackerel scad from the sample were measured to nearest cm (fork length for tuna and large pelagic species and total length for mackerel scad).

The large size tunas, billfish and other species that were separated as brails were emptied into the wells. These were weighed and measured separately.

C. Species identification

Species identification was done by Observers based on available identification guides. Special attention was given on the distinctive characteristics of small size yellowfin and bigeye tunas.

D. Analysis

Data were analyzed using descriptive presentation of data using Microsoft Excel to illustrate a general status of operation in HSP1. These include species composition, Effort, CPUE and length frequency.

Information on the number of days the vessels stayed at HSP1 was based VMS data on time/date of entry and exit from HSP1.

III. Results

A. Catch and fishing effort

The group seine fleets that were able to fish in HSP1 in 2019 were composed of 30 purse seine and 5 ringnet catcher vessels. The fleet opted to operate only for 9 months (January-June; October-December) in accordance to paragraph 14 of CMM 2018-01.

Overall, the 35 vessels spent a total of 7,232 days in HSP1 and actual 2,654 fishing days, or just about one (1) fishing day for every 2.7 days spent by each vessel in the HSP1. FAO 245 which provides regulation and guidelines for the operation of Philippine group seine operation set the annual catch limit not to exceed an equivalent of 9,846 fishing days for the 36 vessels, or corresponding to 273.5 fishing days per vessel.

In addition, of the total 2,654 fishing days, only 2,402 sets were successful or an efficiency rate of 91%. Unsuccessful fishing days were attributed to damaged gear, machinery malfunction, unfavourable sea condition and other factors, which resulted to no catch to be retained whole weight.

Table 1. Summary of catch and effort of Philippine group seine operation in HSP1, 2019

Month	No. of Catchers	Days @ HSP1	Fishing days	Set/HSP 1 days	Total catch (t)	Catch rate (t/set)	Catch rate (t/HSP1 day)
JAN	32	980	346	2.83	2,798	8.09	2.85
FEB	30	889	214	4.15	2,213	10.34	2.49
MAR	27	877	349	2.51	3,609	10.34	4.12
APR	27	804	365	2.20	2,762	7.57	3.44
MAY	27	827	324	2.55	2,573	7.94	3.11
JUN	25	611	230	2.66	1,650	7.18	2.70
OCT	25	744	318	2.34	3,336	10.49	4.48
NOV	24	741	248	2.99	2,305	9.29	3.11
DEC	24	759	260	2.92	2,089	8.04	2.75
TOTAL		7,232	2,654	2.72	23,336	8.79	3.23

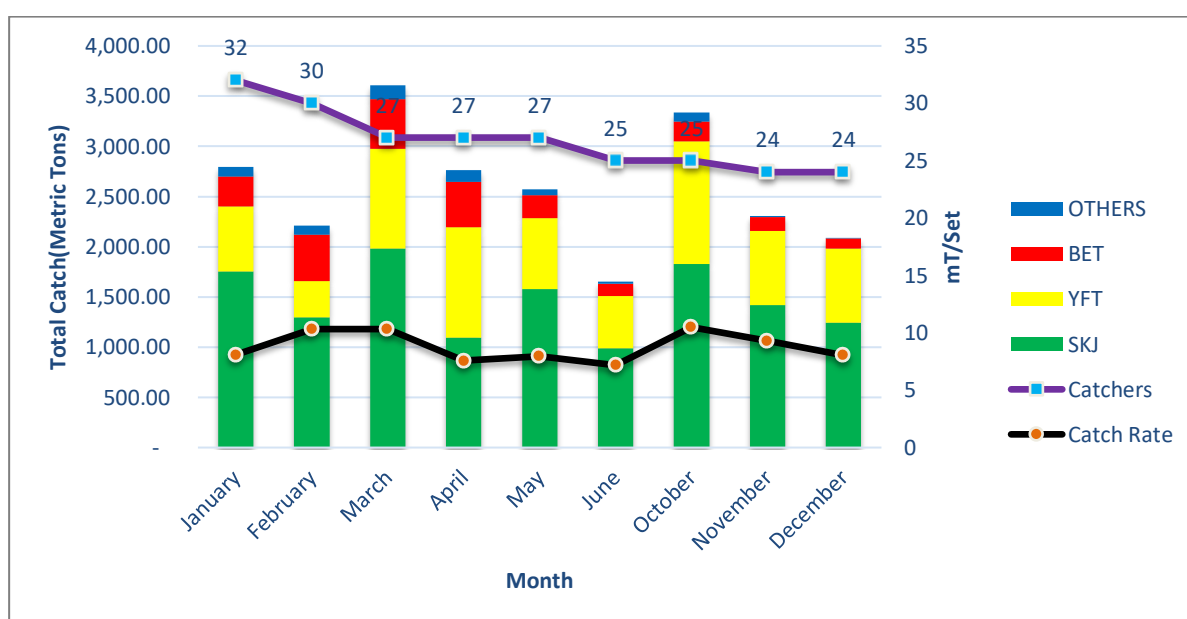


Figure 1. Catch and effort of Philippine group seine operations in HSP1, 2019

B. Catch and species composition

A total of 23,336 tons of fish was caught in HSP1 for 2019, translating to a catch-per-unit effort of 8.79 tons/vessel/fishing day or 3.23 tons/vessel/day in HSP1. The bulk of the catch was composed of skipjack (56.50%) and yellowfin (30.13%). Bigeye was at 10.66% while the remaining 2.71% was comprised of other species including mackerel scad, kawakawa, frigate and bullet tuna, bigeye scad, dolphin fish and triggerfish (Table 2, Fig. 1).

Sharks and other species of special interest were also occasionally caught during the operation, including 138 sharks, 11 dolphins, 4 sea turtle, 3 pelagic stingray 1 giant manta ray and 6 *Mobula* spp.

Table 2. Catch of major species by month

Month	SKJ	YFT	BET	OTHERS	TOTAL
JAN	1,751.37	649.86	296.04	100.24	2,797.51
FEB	1,294.16	362.71	460.97	95.05	2,212.90
MAR	1,984.44	993.29	494.27	137.32	3,609.33
APR	1,096.94	1,098.72	451.86	114.66	2,762.19
MAY	1,580.00	706.01	228.15	58.48	2,572.64
JUN	986.75	523.44	120.05	20.11	1,650.35
OCT	1,825.56	1,224.54	197.39	88.87	3,336.37
NOV	1,420.68	735.48	137.57	11.40	2,305.12
DEC	1,243.98	737.85	102.17	5.29	2,089.29
TOTAL	13,183.89	7,031.90	2,488.47	631.42	23,335.69

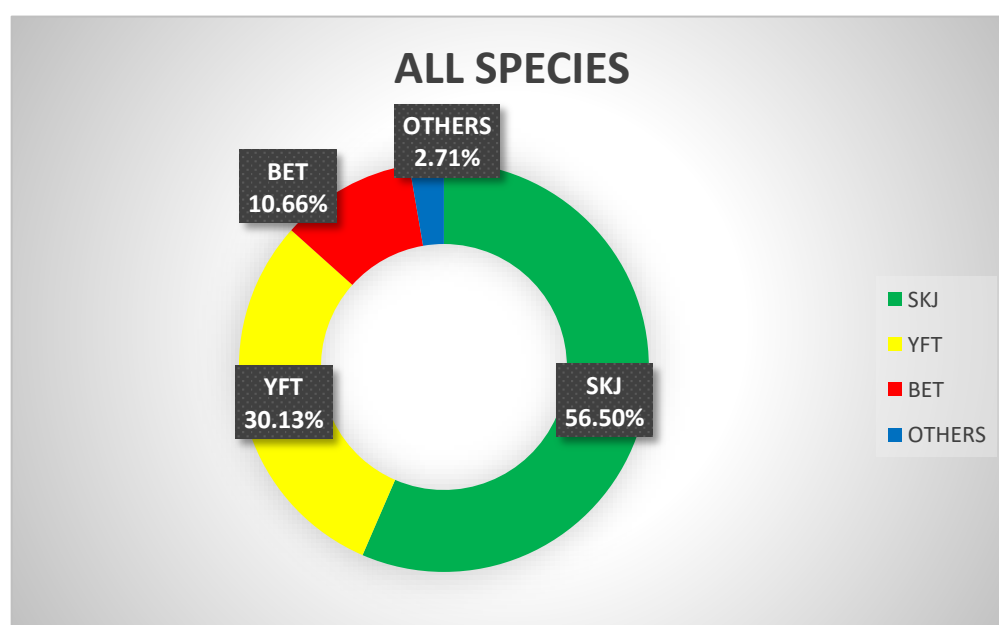


Figure 2. Catch composition of Philippine group seine in HSP1, 2019

C. Size composition

Table 3 illustrates the length frequency of SKJ, YFT and BET indicating average length of 45.99, 55.09, and 61.50 centimeters respectively. Skipjack and Yellowfin tuna shows an upward trend starting from February to December. This is contrasting with the trend of Bigeye tuna which shows a downward direction from February to May. Skipjack tuna indicated modal peaks at 42 and 55 centimeters (Fig 3, Table 3) while Yellowfin Tuna form mode at 54 centimeters and Bigeye Tuna at 55 centimeters. The average size of the Skipjack Tuna and

Yellowfin Tuna were found to be smallest at under 39 and 51 centimeters in the month of January and February respectively while BET found to be smallest in May at 56 centimeters (Fig 4).

Table 3. Average length of SKJ, YFT, BET and MSD caught in HSP1

Species	SKJ	YFT	BET	MSD
n	221,262	80,801	14,544	95,555
Ave (cm)	45.99	55.09	61.50	22.72
Min (cm)	11	11	16	10
Max (cm)	88	137	119	64
Mode(cm)	42,55	54	55	21

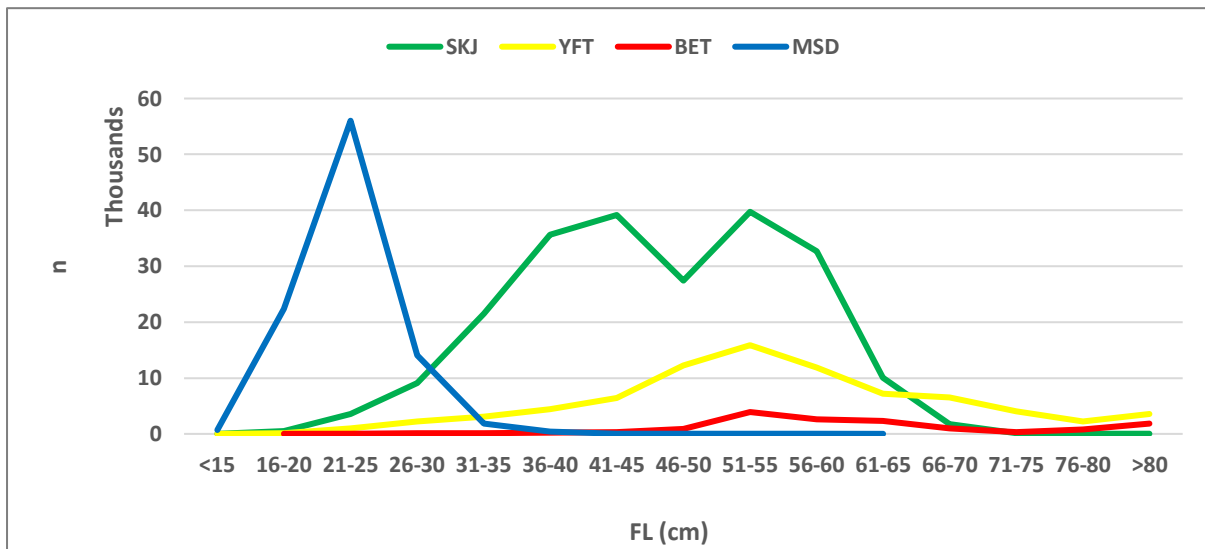


Figure 3. Size composition of SKJ, YFT, BET and MSD caught in HSP1

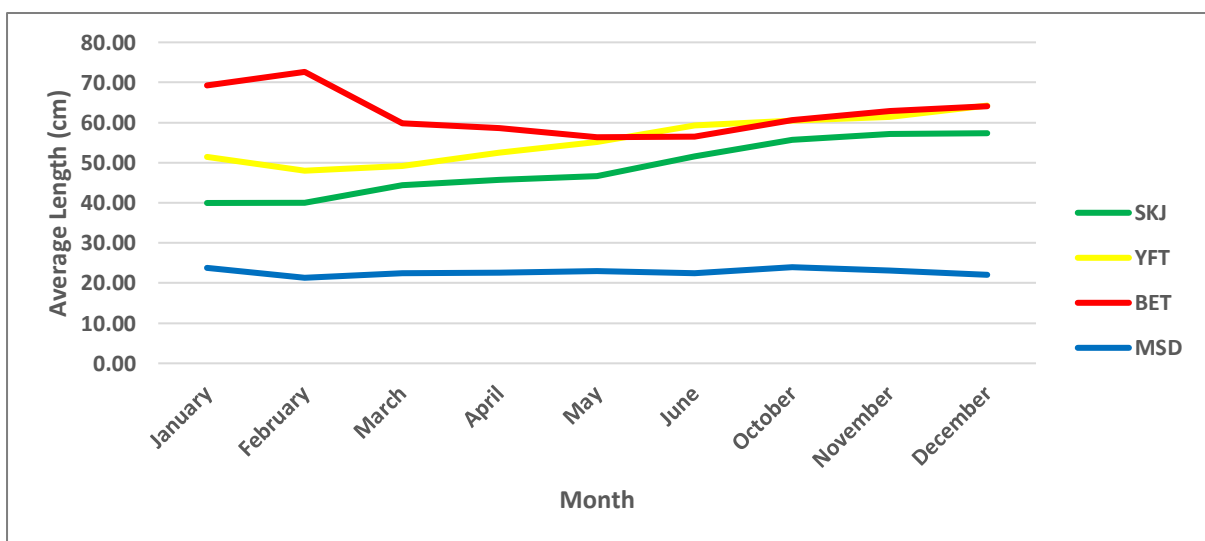


Figure 4. Average size of SKJ, YFT, BET and MSD caught in HSP1

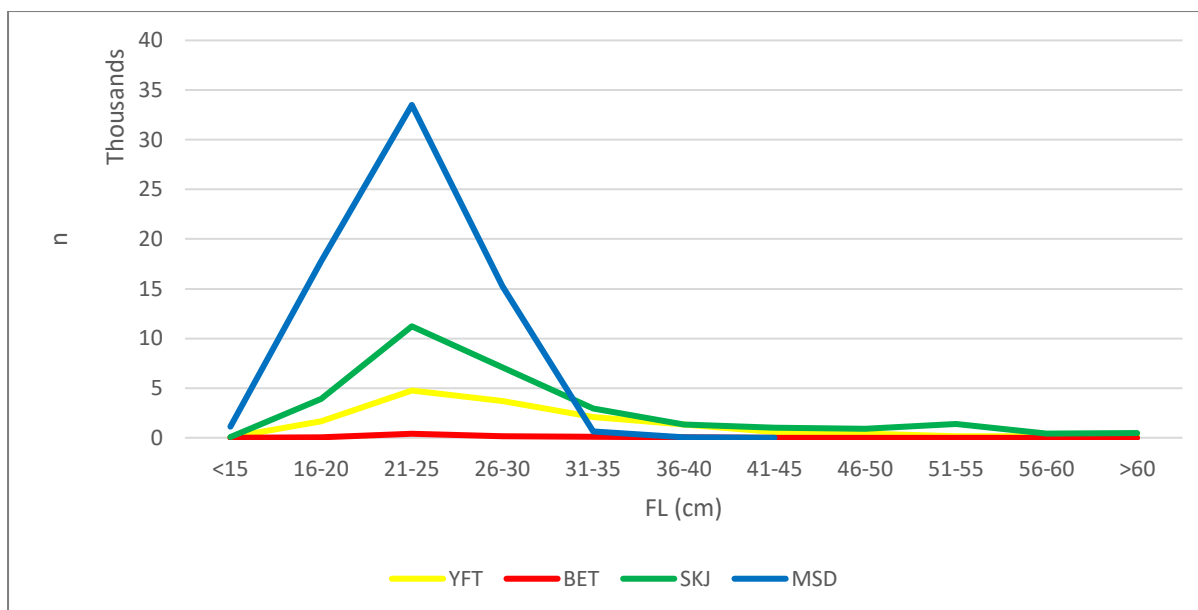


Figure 3. Size composition of SKJ, YFT, BET and MSD caught in Philippine EEZ (FAD Closure 2019)

In contrast with fish caught within Philippine EEZ in 2019, the lengths for the three tuna species (SKJ, YFT and BET) were relatively smaller with modal lengths at 21, 26 and 24 centimeters and average lengths of 28.93, 29.30 and 27.22 centimeters respectively (Fig 5, Table 4).

Table 4. Range and size of SKJ, YFT, BET and MSD caught in Philippine EEZ (FAD Closure, 2019)

Species	SKJ	YFT	BET	MSD
n	30,815	15,189	806	68,326
Ave (cm)	28.93	29.30	27.22	22.75
Min (cm)	10	11	14	10
Max (cm)	79	138	124	43
Mode (cm)	21,26	26	24	23

Table 5. Comparative Summary of HSP1 and Philippine EEZ Catch in 2019

Species	HSP1 Catch Composition(%)	PHIL EEZ Catch Composition(%)*	HSP1 Average Size (cm)	PHIL EEZ Average Size (cm)*
SKJ	56.50	40.01	45.99	28.93
YFT	30.13	22.69	55.09	29.30
BET	10.66	1.24	61.50	27.22
MSD(OTHERS)	2.71	36.06	22.72	22.75

*based on observer estimate during FAD Closure

D. Catch variation by depth of net

Initial analysis on the variation of catch with depth of net was made. The actual stretched depths of nets were measured during inspections as a condition to their license to fish in HSP1. Depth of nets ranged from 103-180 fathoms (Table 6) and were classed by 20 fathoms, in particular >161, 141-160, 121-140 and 101-120 fathoms.

Table 6. Number of observations by depth of net (class)

Depth of net (Class)	No. of sets
101-120	1,062
121-140	735
141-160	455
≥161	402
Grand Total	2,654

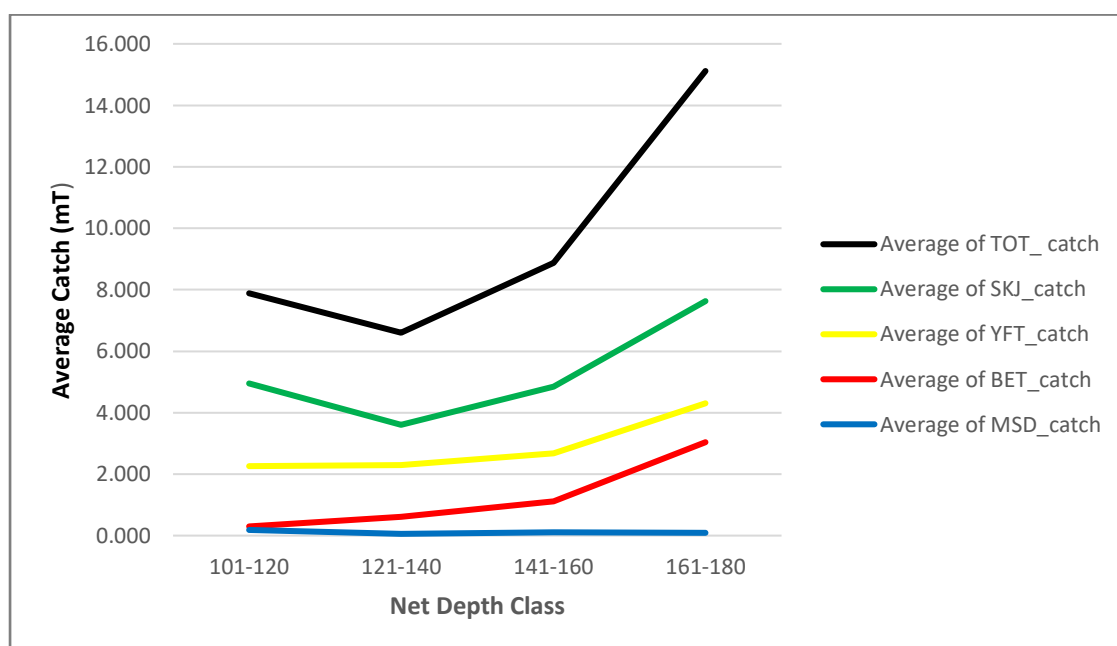


Figure 6. Average catch by species by net depth

Catch variation across gear depths is shown in Fig. 6, indicating increase on the average catch of BET and YFT with increasing depth of net. It was also observed that deeper nets had the lowest MSD catch.

Attempt was made to determine decrease of BET catch by depth of net class by forecasting (linear regression) indicating decrease of about 46%-63% for every 20 fathoms decrease in net depth.

Table 7. BET catch reduction by linear regression (forecast)

Net depth range (fm)	Average catch (t/set)	% BET Decrease
≥161	3.038	
141-160	1.116	63%
121-140	0.602	46%
101-120	0.298	50%

IV. Summary / Recommendations

1. The catch in 2019 of the Philippine group seine fleet in HSP1 totaled to 23,336 tons of which 22,704 mt were SKJ, YFT and BET or comprised about 15% of the production of these tuna species that were caught within Philippine EEZ.
2. The average catch was catch-per-unit effort of 8.79 tons/vessel/fishing day or 3.23 tons/vessel/day in HSP1.
3. The average length of SKJ, YFT and BET caught in HSP1 were relatively bigger than tunas caught from Philippine EEZ.
4. Reduction of net depth to reduce the catch of BET should be evaluated and considered as an alternative measure to reduce BET and YFT catch in purse seine fishery.

V. References

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