



**SCIENTIFIC COMMITTEE
FOURTEENTH REGULAR SESSION**

**Busan, Republic of Korea
8-16 August 2018**

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

WCPFC-SC14-2018 ST-IP-06

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ABSTRACT

This paper reports the Philippine group seine operations in High Seas Pocket 1 based on Observer reports in 2017. It covers thirty-three (33) operational catcher vessels during the period January-June and October-December 2017. 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

The 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 two main objectives of CMM 2008-01 were to reduce bigeye tuna fishing mortality and no increase in yellowfin tuna fishing mortality from the annual average during the period 2001-2004 or 2004. HSP1 is bounded by the exclusive economic zones or EEZs of Federated 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 that gave 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. while CMM 2013-01 and its amendments provided measures for 2014 until December 2017. 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 and 245-3) was issued by the Department of Agriculture through the Bureau of Fisheries and Aquatic Resources (BFAR) to set the regulations and implementing guidelines on the operations of the fleet in HSP1. In addition, FAO 240 was also adopted for the implementation of the National Fisheries Observer Program (NFOP) covering high seas. Further, 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 33 vessels that were able to conduct fishing in HSP1 in 2017. The fleet opted to operate only for 9 months (January-June; October-December), in adherence to paragraph 14 of CMM 2016-01.

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 :

$$\text{Volume (V)} = \pi r^2 h$$

$$\text{Brail capacity} = \text{Volume} \times 80\%$$

Where;

$$\pi = 3.14$$

h= Brail height

r = Brail diameter (d)/ 2

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

Overall, 33 catcher vessels in HSP1 in 2017. The fleet was composed of 28 purse seines and 5 ringnets that opted to operate only for 9 months (January-June; October-December) in accordance to paragraph 14 of CMM 2016-01.

The fleet spent a total of 7,677 days in HSP1, with 2,696 actual fishing days or sets, or just about one (1) fishing day or set for every 2.8 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 all of the 36 vessels.

In addition, of the total 2,696 actual sets/fishing days, only 2,569 sets were successful or an efficiency rate of 95%. Unsuccessful fishing days were attributed to damaged gear, machinery malfunction, unfavorable 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, 2016

Month	No. of Catchers	Days @ HSP1	Fishing days	Set/ HSP1 days	Total catch (t)	Catch rate (t/set)	Catch rate (t/HSP1 day)
JAN	29	909	268	3.39	2,299	8.58	2.53
FEB	27	780	217	3.59	1,823	8.40	2.34
MAR	29	890	312	2.85	2,434	7.80	2.74
APR	31	898	290	3.10	1,752	6.04	1.95
MAY	31	943	295	3.20	1,672	5.67	1.77
JUN	28	584	208	2.81	918	4.41	1.57
OCT	29	851	389	2.19	5,818	14.96	6.84
NOV	30	900	407	2.21	5,943	14.60	6.60
DEC	30	922	310	2.97	2,855	9.21	3.10
TOTAL	32	7,677	2,696	2.85	25,515	9.46	3.32

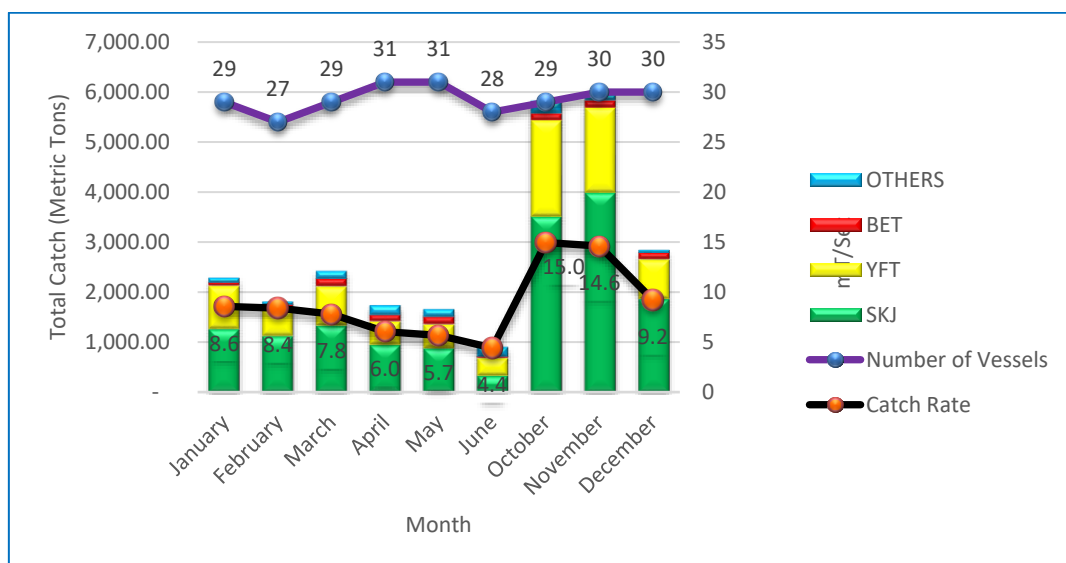


Figure 1. Catch and effort of Philippine group seine operations in HSP1, 2017

B. Catch and species composition

A total of 25,515 tons of fish was caught in HSP1 for 2017, translating to a catch-per-unit effort of 9.46 tons/vessel/set or 3.32 tons/vessel/day in HSP1. The bulk of the catch was composed of skipjack (60.04%) and yellowfin (30.69%). Bigeye was at 4.13% while the remaining 5.14% was comprised of other species including mackerel scad, kawakawa, frigate and bullet tuna, bigeye scad, dolphin fish and triggerfish (Table 2, Fig. 1).

There were also occasional instances or interaction with sharks and other species of special interest during the group seining operation, involving 64 sharks, 37 dolphins, 3 sea turtles, 10 giant manta ray and 1 *Mobula spp.*

Table 2. Catch composition by month

Month	SKJ	YFT	BET	OTHERS	TOTAL
JAN	1,277.03	856.87	63.65	101.31	2,298.85
FEB	1,135.33	515.07	108.00	64.93	1,823.33
MAR	1,342.78	779.38	153.14	159.17	2,434.47
APR	957.99	465.59	127.87	200.86	1,752.31
MAY	889.11	472.51	155.17	155.53	1,672.32
JUN	342.05	346.97	33.12	195.72	917.87
OCT	3,513.75	1,915.50	134.87	253.75	5,817.87
NOV	3,987.06	1,694.41	143.25	118.71	5,943.43
DEC	1,874.68	783.22	134.90	61.79	2,854.60
TOTAL	15,319.78	7,829.51	1,053.99	1,311.77	25,515.05

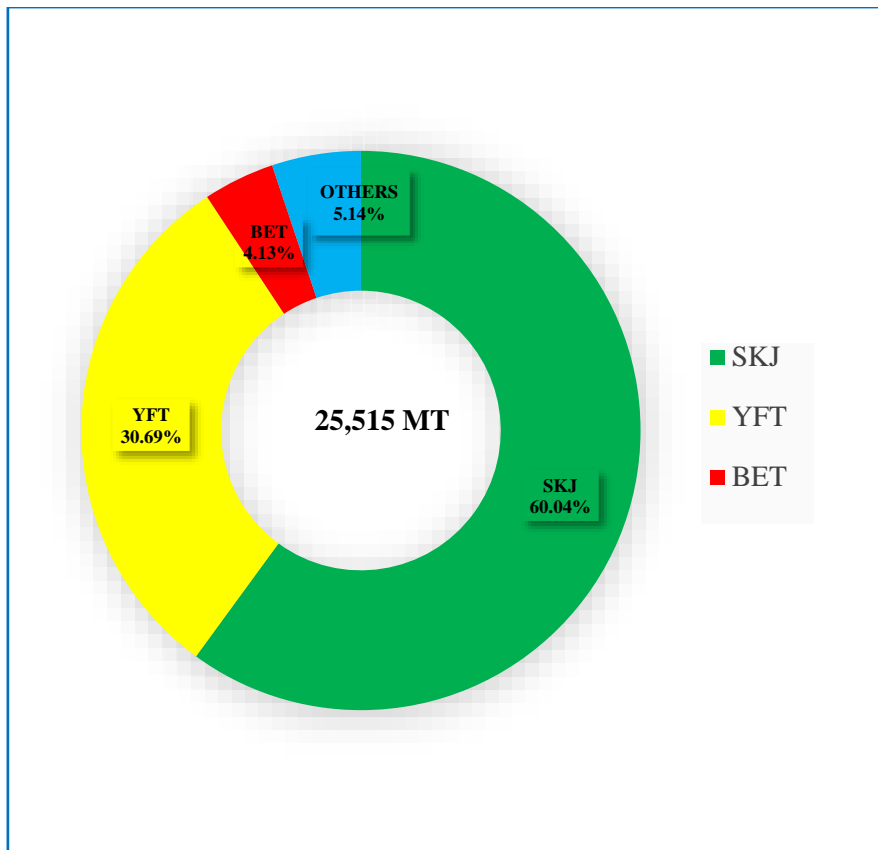


Figure 2. Catch composition of Philippine group seine in HSP1, 2017

C. Size composition

Table 3 illustrates the sizes of skipjack (SKJ), yellowfin (YFT) and bigeye (BET) tunas, indicating and average length of 38 cm, 41 cm and 51 cm respectively. All of the species show downward trends in size, starting from February to April and uptrend from October to December. Skipjack tuna indicated modal peaks at 26 and 43 cm (Fig 3, Table 3), yellowfin tuna at 45 cm and bigeye tuna at 29 cm and 50cm. The average sizes of yellowfin tuna and skipjack tuna were found to be smallest at under 35 cm and 30 cm in the months of April and June, respectively while bigeye tuna was found to be smallest in October (Fig 4).

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

Species	SKJ	YFT	BET	MSD
n	324,266	157,603	10,341	163,063
Ave (cm)	38.41	41.91	51.28	24.61
Min (cm)	12	14	17	10
Max (cm)	90	135	125	57
Mode(cm)	26,43	45	29,50	22

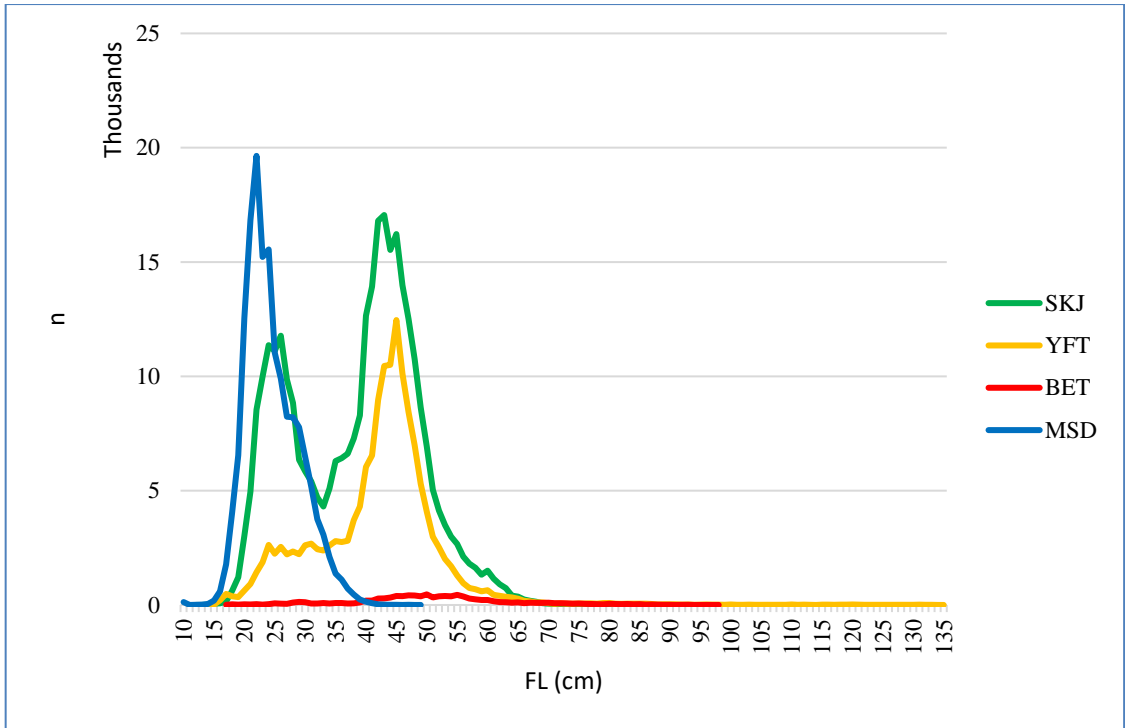


Figure 3. Size composition of SKJ, YFT, BET and MSD caught in HSP1

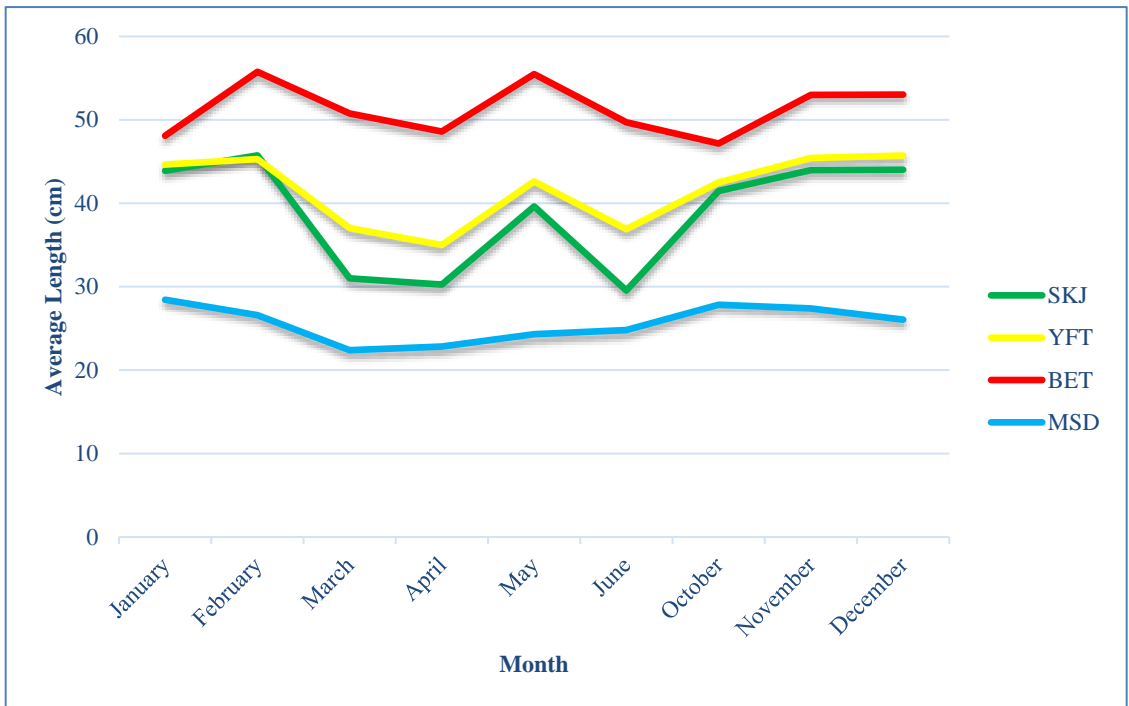


Figure 4. Average size of SKJ, YFT, BET and MSD caught in HSP1

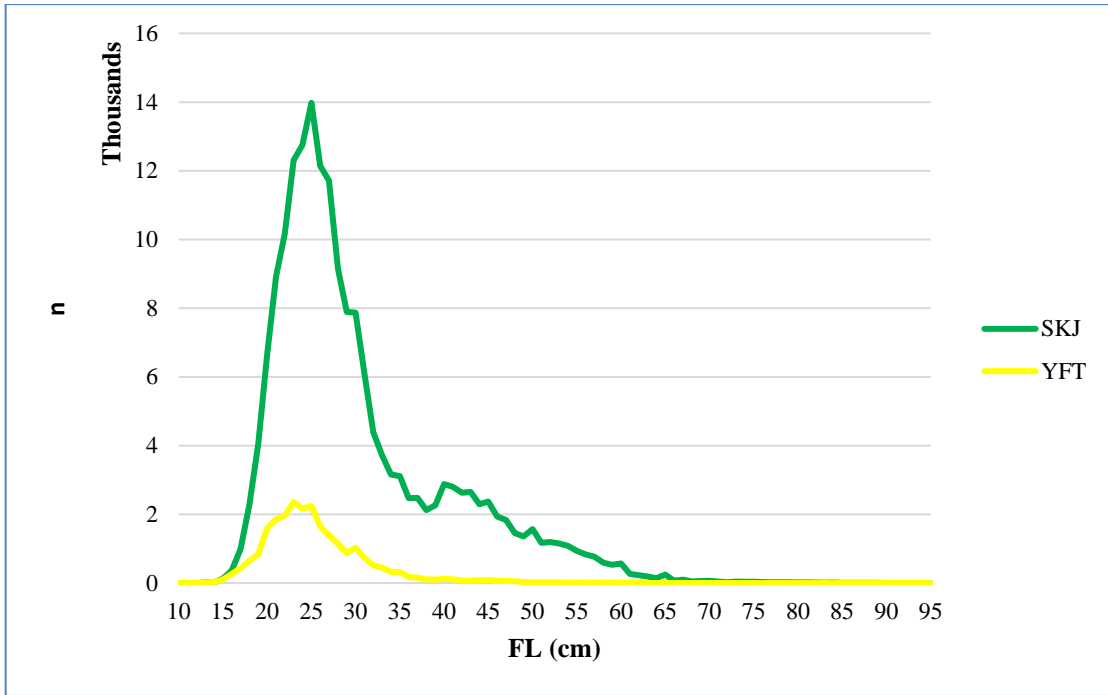


Figure 35. Size composition of SKJ, YFT, BET and MSD caught in Philippine EEZ (NSAP 2017)

In contrast with fish caught within Philippine EEZ in 2017, the lengths for the 2 tuna species (SKJ and YFT) were relatively smaller with modal lengths at 25 and 23 cm and average lengths of 30.46 cm and 25.62 cm respectively (Fig 5, Table 4).

Table 4. Range and size of SKJ, YFT, BET and MSD caught in Philippine EEZ (NSAP data, 2017)

Species	SKJ	YFT
n	185,678	24,403
Ave (cm)	30.46	25.62
Min (cm)	11	13
Max (cm)	95	79
Mode (cm)	25	23

Table 5. Comparative Summary of HSP1 and Philippine EEZ Catch in 2017

Species	HSP1 Catch Composition(%)	PHIL EEZ Catch Composition(%) *	HSP1 Average Size (cm)	PHIL EEZ Average Size (cm)**
SKJ	60.05	54.93	38.41	30.46
YFT	30.68	28.22	41.91	25.62
BET	4.13	2.90	51.28	
MSD(OTHERS)	5.14	13.95	24.61	

*based on observer estimate during FAD Closure **NSAP data

D. Catch variation by depth of net

Analysis on the variation of catch with depth of net was also 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 103-198 fathoms (Table 6) and were classed by 20 fathoms, in particular >141, 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	1,001
121-140	1,116
>141	579
Grand Total	2696

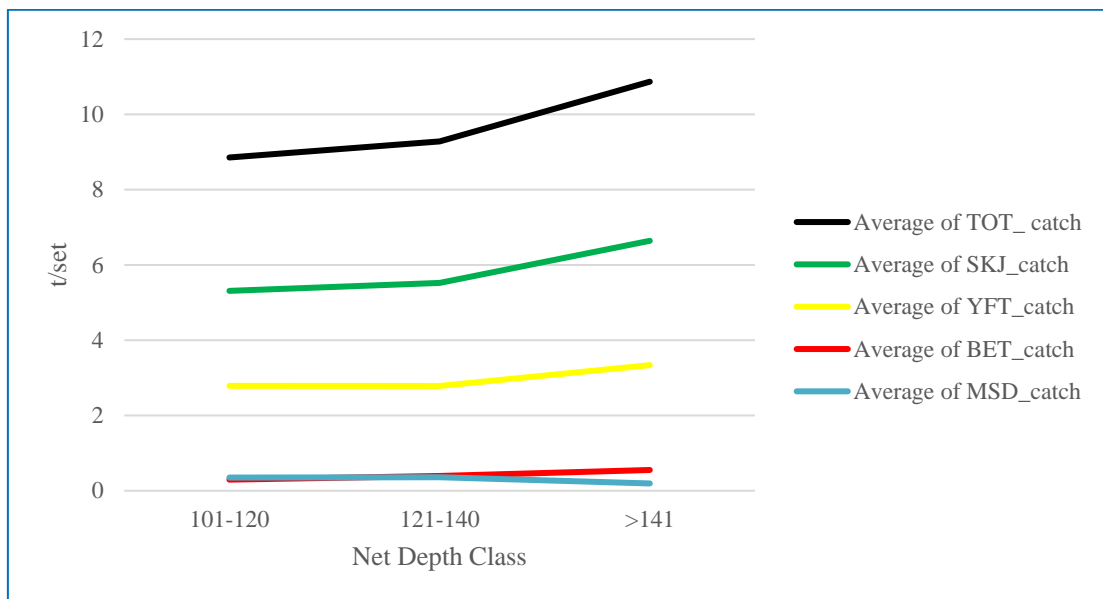


Figure 6. Average catch by species by net depth

The catch variation across gear depths are shown in Fig. 6, indicating increase on the average catch for SKJ, YFT and BET with increasing depth of net. It was also observed that largest 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 25%-29% for every 20 fathoms decrease in net depth.

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

Net depth range	Average catch (t/set)	% BET Decrease
>141	0.552	
121-140	0.394	29%
101-120	0.295	25%

IV. Summary / Recommendations

- 1) The total catch in 2017 of the Philippine group seine fleet in HSP1 was 25,515 tons; 24,203 MT or 95% were SKJ, YFT and BET;
- 2) The average catch was catch-per-unit effort of 9.46 tons/vessel/set or 3.32 tons/vessel/day;
- 3) The average length of SKJ, YFT and BET caught in HSP1 were relatively bigger than tunas caught in Philippine EEZ.
- 4) Net depth reduction should be considered as a measure to reduce BET and YFT catch in purse seine fishery.

V. References

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