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

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ABSTRACT

This paper reports the operations of Philippine group seine operations in High Seas Pocket Number 1 based on Observer reports in 2022. It covers twenty-seven (27) operational catcher vessels during the period January-June and October-December 2022. 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, CMM 2018-01 for 2019-2021 and CMM 2021-01 for 2022. 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

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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 27 vessels that were able to conduct fishing in HSP1 in 2022. The majority of the fleet opted to operate only for 9 months (January-June; October-December) in adherence to paragraph 14 of CMM 2021-01.

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 the 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. The 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:

Volume (V) = $\pi r^2 h$
Brail capacity = Volume x 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 for 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 the 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 to the distinctive characteristics of small size yellowfin and bigeye tunas.

D. Analysis

Data were analyzed using the 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 on 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 2022 were composed of twenty-six (26) purse seine and one (1) ringnet catcher vessels. The fleet opted to operate only for 9 months (January-June; October-December) in accordance to paragraph 14 of CMM 2021-01. During the FAD Closure period, the Philippines allowed 3 vessels with free school fishing capacity to conduct free school operation during the FAD closure but unfortunately, only one free school set was made and no catch was recorded.

Overall, the 27 vessels spent a total of 5,636 days in HSP1 and actual 2,562 fishing days, or just about one (1) fishing day for every 2.2 days spent by each vessel in the HSP1 (Table 1, Fig. 1). 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 fishing days per vessel.

In addition, of the total 2,562 fishing days, only 2,312 sets were successful or an efficiency rate of 90%. Unsuccessful fishing days were attributed to damaged gear, machinery malfunction, unfavorable sea conditions, and other factors, which resulted in no catch being retained whole weight.

Table 1. Summary of catch and effort of Philippine group seine operation in HSP1, 2022

Month	No. of Catchers	Days @ HSP1	Fishing days	HSP1 days/set	Total catch (t)	Catch rate (t/set)	Catch rate (t/HSP1 day)
JAN	24	747	340	2.20	2,765.82	8.13	3.70
FEB	23	696	270	2.58	2,257.01	8.36	3.24
MAR	25	752	306	2.46	2,177.67	7.12	2.90
APR	22	648	219	2.96	1,468.76	6.71	2.27
MAY	20	615	277	2.22	2,184.49	7.89	3.55
JUN	19	493	267	1.85	2,767.62	9.24	5.00
SEP	2	4					
OCT	17	539	330	1.63	3,466.95	10.51	6.43
NOV	17	753	303	2.49	3,823.17	12.62	6.91
DEC	17	589	250	2.36	2,071.21	8.29	3.52
TOTAL		**5,636**	**2,562**	**2.20**	**22,682.22**	**8.85**	**4.02**

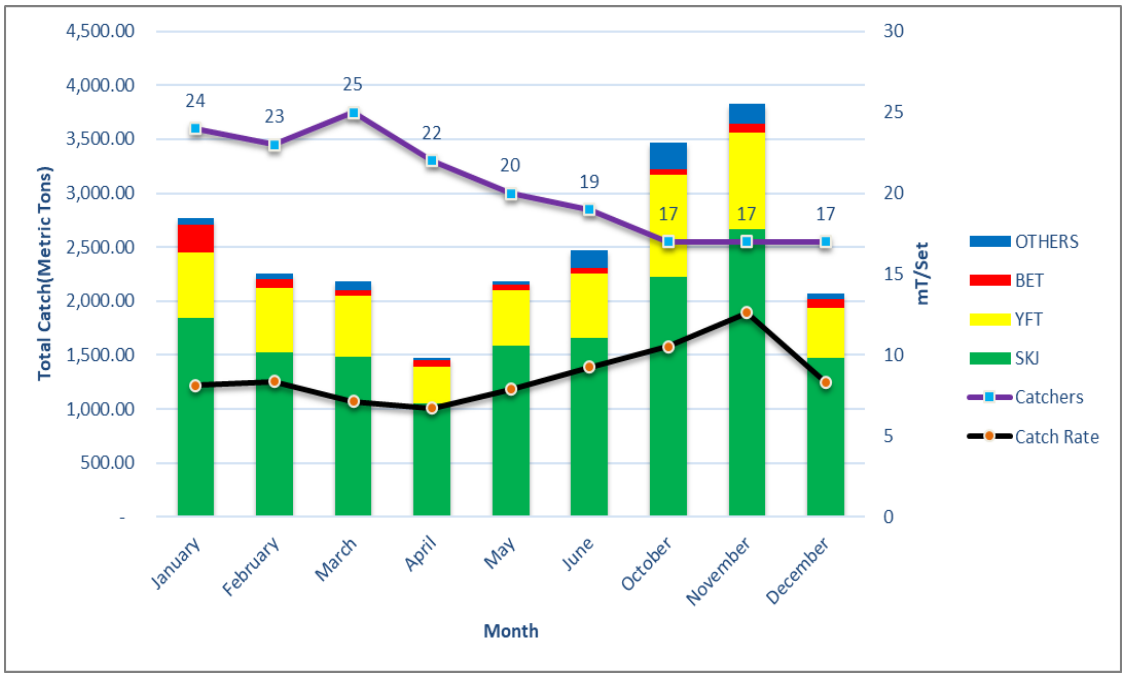

Figure 1. Catch and effort of Philippine group seine operations in HSP1, 2022

B. Catch and species composition

A total of 22,682 tons of fish was caught in HSP1 for 2022, translating to a catch-per-unit effort of 8.85 tons/vessel/fishing day or 4.02 tons/vessel/day in HSP1. The bulk of the catch was composed of skipjack (68.40%) and yellowfin (24.35%). Bigeye was at 3.32% while the remaining 3.92% was comprised of other species including mackerel scad, kawakawa, frigate and bullet tuna, bigeye scad, dolphin fish and triggerfish (Table 2, Fig. 2).

Sharks and other species of special interest were also incidentally encircled during the operation, including 58 sharks, 1 whale, 195 dolphins, 5 sea turtles, 2 giant manta ray, 1 devil ray, and 1 pelagic stingray. These species were handled in

accordance with the relevant Conservation and Management Measures (CMM-2019-04, CMM 2022-04, CMM 2011-03, CMM 2018-04, and CMM 2019-05).

Table 2. Catch of major species by month

Month	SKJ	YFT	BET	OTHERS	TOTAL
JAN	1,843.08	609.78	249.91	63.04	2,765.82
FEB	1,519.2	596.39	87.41	54.02	2,257.01
MAR	1,483.33	568.18	48.34	77.82	2,177.67
APR	1,053.77	335.87	65.15	13.97	1,468.76
MAY	1,589.84	512.94	44.26	37.44	2,184.49
JUN	1,660.53	595.61	52.07	157.91	2,466.13
OCT	2,221.18	945.45	51.19	249.13	3,466.95
NOV	2,670.81	892.42	76.53	183.41	3,823.17
DEC	1,473.68	466.88	78.07	52.68	2,072.21
TOTAL	**15,515.42**	**5,523.53**	**753.84**	**889.42**	**22,682.22**

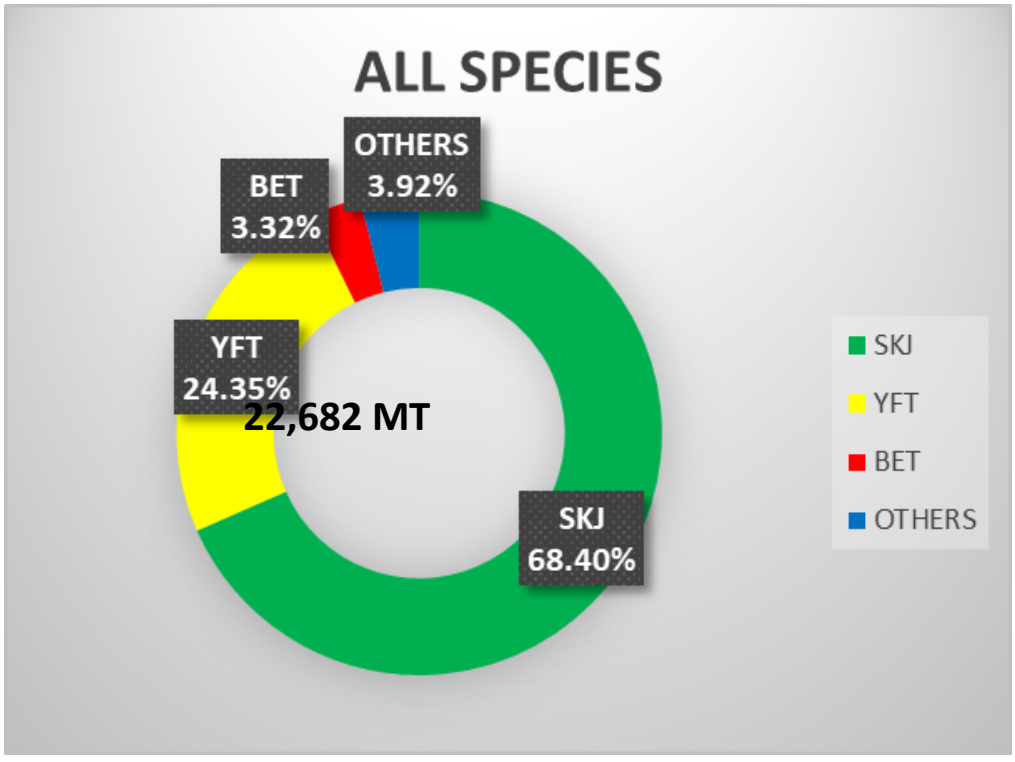

Figure 2. Catch composition of Philippine group seine in HSP1, 2022

C. Size composition

Table 3 illustrates the length frequency of skipjack, yellowfin, and bigeye tuna indicating the average length of 42.59, 47.39, and 51.15 centimeters respectively. yellowfin tuna showed an upward trend starting from January to June while the

bigeye tuna showed an increasing size trend from February to May and started to decrease in June (Fig 4). Skipjack tuna, on the other hand, showed an upward trend from January to April only and started to reduce in average size from May to June. All three species of tuna show an upward direction from October to November. Skipjack, yellowfin, and bigeye tuna also indicated modal peaks at 42, 45, and 45 centimeters respectively (Fig 3, Table 3). The average size of the skipjack and yellowfin tuna were found to be smallest at under 39 and 43 centimeters respectively both in October while bigeye tuna was found to be smallest in February at 48 centimeters (Fig 4). Inversely, skipjack tuna was at the highest average size in April, bigeye tuna in January, and yellowfin tuna in June at 45, 53, and 53 centimeters respectively.

Table 3. Range and size of SKJ, YFT, BET and MSD caught in HSP1, 2022

Species	SKJ	YFT	BET	MSD
n	307,506	85,907	7,319	101,768
Ave (cm)	**42.59**	**47.39**	**51.15**	**24.94**
Min (cm)	12	13	16	7
Max (cm)	81	129	120	62
Mode(cm)	42	45	45	22

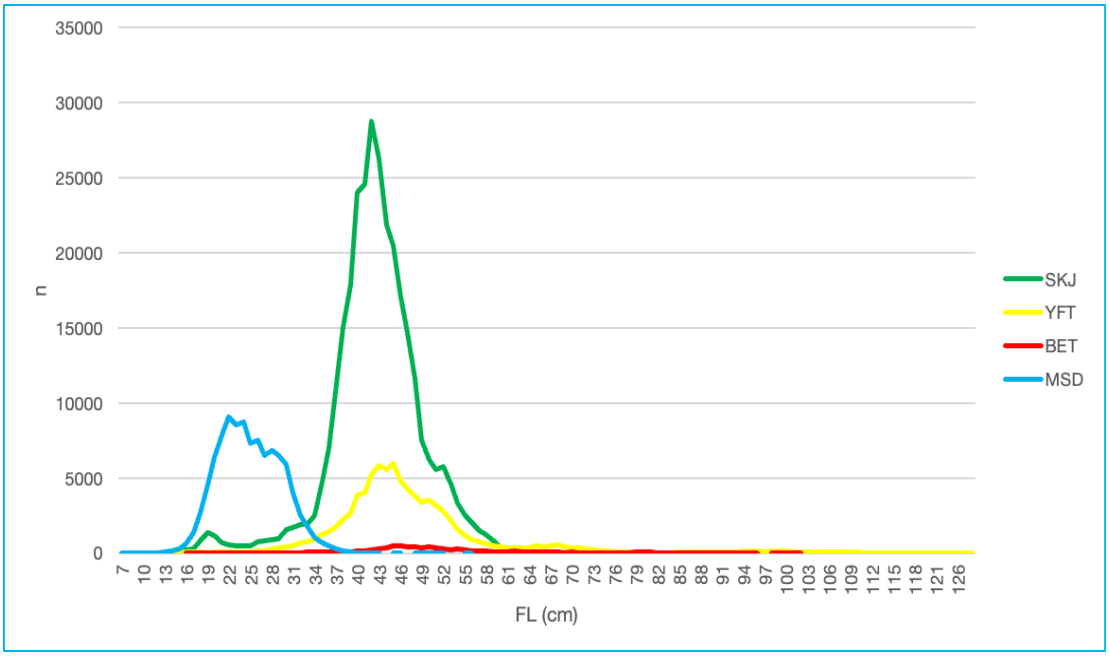

Figure 3. Size composition of SKJ, YFT, BET and MSD caught in HSP1, 2022

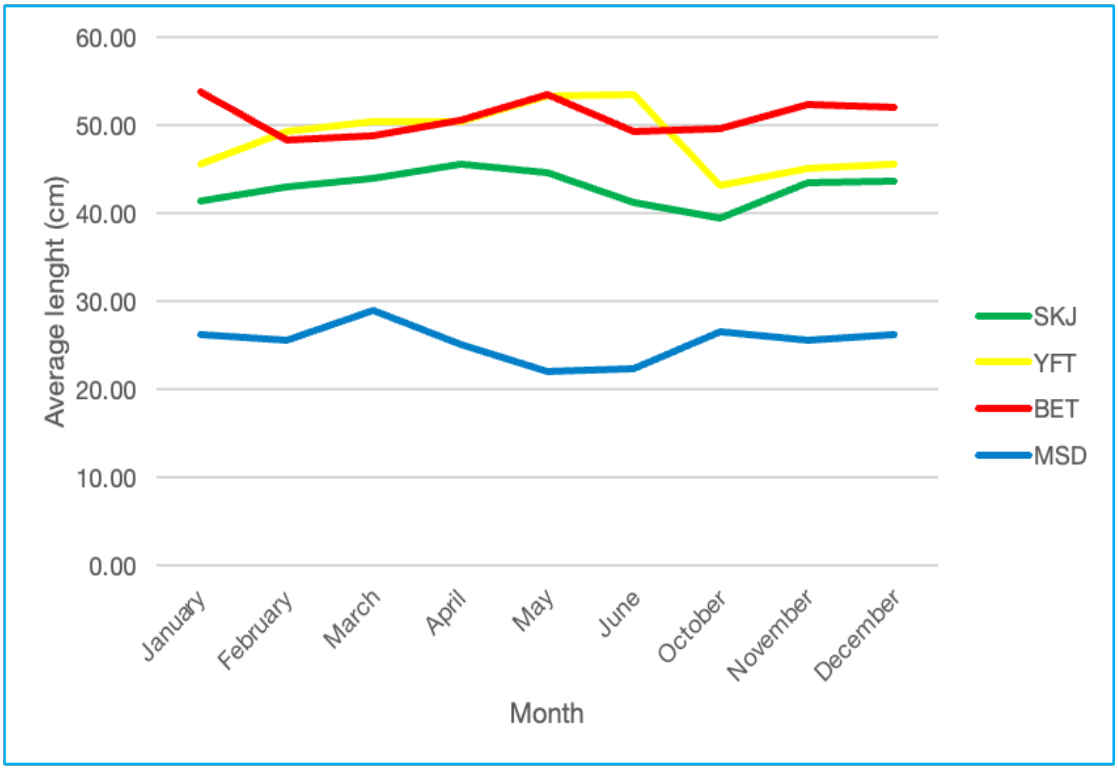

Figure 4. Monthly average size of SKJ, YFT, BET and MSD caught in HSP1, 2022

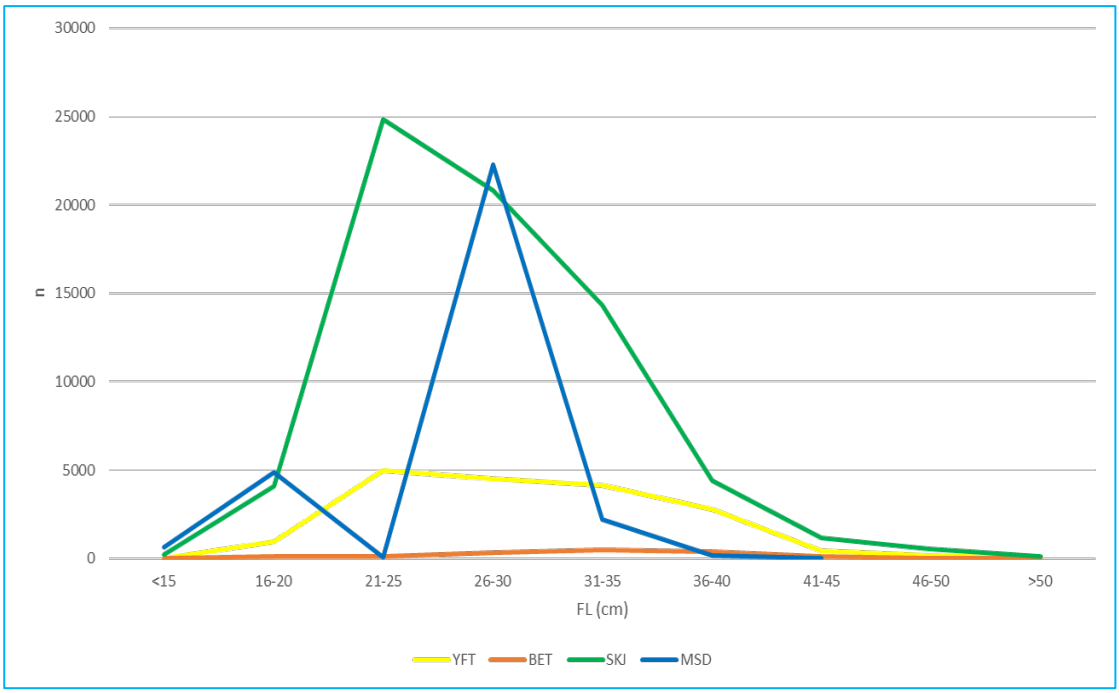

Figure 5. Size composition of SKJ, YFT, BET, and MSD caught in Philippine Waters, 2022

In contrast with fish caught within Philippine EEZ and other Philippines waters in 2022, the lengths for the three tuna species (SKJ, YFT, and BET) were relatively

smaller with modal lengths at 29, 23 and 34 centimeters and average lengths of 28.45, 29.36 and 32.47 centimeters respectively (Fig 5, Table 4).

Table 4. Range and size of SKJ, YFT, BET, and MSD caught in Philippine Waters in 2022

Species	SKJ	YFT	BET	MSD
n	61,212	18,016	1,596	56,076
Ave (cm)	28.45	29.36	32.47	24.96
Min (cm)	10	12	15	12
Max (cm)	66	117	77	44
Mode (cm	29	23	34	26

Table 5. Comparative Summary of HSP1 and Philippine Waters Catch in 2022

Species	HSP1 Catch Composition(%)	PHIL EEZ Catch Composition(%)*	HSP1 Average Size (cm)	PHIL EEZ Average Size (cm)*
SKJ	68.40	51.83	42.59	28.45
YFT	24.35	16.91	47.39	29.36
BET	3.32	3.07	51.15	32.47
MSD(OTHERS)	3.92	28.19	24.94	24.96

*based on observer purse seine/ringnet records in Philippine waters

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 103-201 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	670
121-140	742
141-160	346
≥161	804
Grand Total	**2,562**

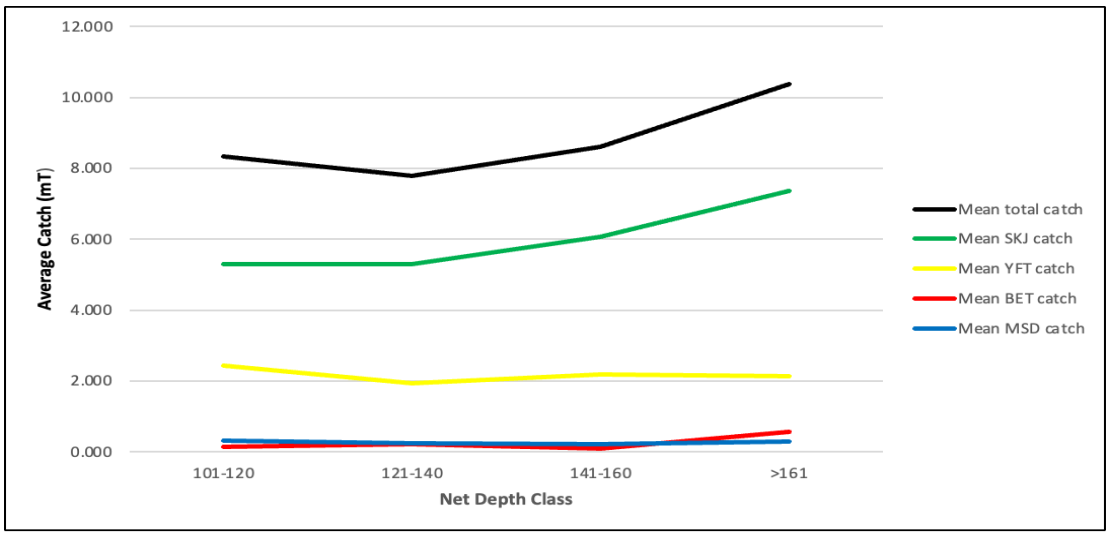

Figure 6. Average catch by species by net depth

Catch variation across gear depths is shown in Fig. 6, indicating an increase in the average catch of the three tuna species with increasing depth of net. For yellowfin tuna, however, the catch was highest at the net depth of 101-120 fathoms and seems not to show a very significant increase in catch as the net goes deeper. Conversely, skipjack tuna showed a clear pattern of increasing catch with deeper net depth.

For bigeye tuna catch, Table 7 showed a decrease of about 38%-82% for every 20 fathoms decrease in net depth except for the net depth range of 141-160 to 121-140 fathoms where there is an increase of 121% in average bigeye tuna catch.

Table 7. BET catch reduction

Net depth range (fm)	Average catch (t/set)	% BET Decrease
≥161	0.566	
141-160	0.103	82%
121-140	0.227	-121%
101-120	0.142	38%

IV. Summary / Recommendations

1. The catch in 2022 of the Philippine group seine fleet in HSP1 totaled 22,682 metric tons of which 22,682 mt were skipjack, yellowfin, and bigeye tuna or comprised about 15% of the production of these tuna species that were caught within Philippine EEZ.

2. The average catch was a catch-per-unit effort of 8.85 tons/vessel/fishing day or 4.02 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.

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