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SELECTIVITY AND ENVIRONMENTAL FRIENDLINESS OF PURSE SEINE FISHING GEAR IN WATERS KUPANG BAY, EAST NUSA TENGGARA

Tingkat Selektivitas dan Keramah Lingkungan Alat Tangkap Purse Seine di Perairan Teluk Kupang, Nusa Tenggara Timur

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ABSTRACT

Purse seine is a type of multi-species fishing gear and is classified as an active fishing gear. The very small mesh size can have an impact on the size of fish species, the composition of the type of catch, both main and by-catch and has a low level of selectivity which causes overfishing and will have an impact on reducing the availability of fish resources. This research aims to determine the level of selectivity and environmental friendliness of Purse seine fishing gear operated in Kupang Bay waters. The research uses descriptive methods. The data were analyzed using the Shannon Diversity Index formula to calculate selectivity. The results obtained in November 2023 with a value of H'= 1.67, and in December with a value of H'= 1.24, meaning that the purse seine fishing gear is classified as a fishing gear with a high level of diversity and low selectivity. The environmental friendliness level of purse seine fishing gear was obtained with a score of 26.58, which shows that purse seines in the waters of Kupang Bay are categorized as less environmentally friendly ($22.5 < X \leq 31.5$).

Keywords: Selectivity; Environmental Friendliness; Purse Seine; Kupang Bay

ABSTRAK

Purse seine merupakan sejenis alat tangkap multi spesies dan digolongkan ke dalam alat penangkap ikan aktif. Ukuran mata jaringnya yang sangat kecil dapat berdampak pada ukuran spesies ikan, komposisi jenis hasil tangkapan, baik tangkapan utama maupun sampingan serta memiliki tingkat selektivitas rendah yang menyebabkan penangkapan berlebih (overfishing) dan akan berdampak pada menurunnya ketersediaan sumberdaya ikan. Penelitian ini bertujuan untuk mengetahui tingkat selektivitas dan keramahan terhadap lingkungan pada alat tangkap Purse seine yang dioperasikan di Perairan Teluk Kupang. Penelitian menggunakan metode deskriptif. Data dianalisis menggunakan rumus Indeks Keanekaragaman Shannon untuk menghitung selektivitas diperoleh hasil bulan November 2023 dengan nilai H'= 1,67, dan bulan Desember dengan nilai H'= 1,24 mengartikan bahwa alat tangkap purse seine digolongkan

sebagai alat tangkap dengan tingkat keanekaragamn tinggi dan selektivitas rendah. Tingkat keramah lingkungan alat tangkap purse seine di peroleh skor 26,58 yang menunjukan bahwa purse seine di perairan teluk kupang dikategorikan kurang ramah lingkungan (22,5 < X ≤ 31,5).

Kata Kunci: Selektivitas; Keramahan Lingkungan; *Purse Seine*; Teluk Kupang

INTRODUCTION

Kupang Bay has a variety of marine and fisheries resources that provide many benefits to the surrounding community. The potential is utilized by the local community through fishing activities using various types of fishing gear, one of which is using a purse seine. According to (Aisyaroh *et al.,* 2021) Purse seine is a type of fishing gear used to catch various species of fish and is included in the category of active fishing gear. This tool works by surrounding a group of fish, so that the bottom of the net forms a bowl-like depression when the catch is complete. The very small mesh size can affect the size of the fish caught and the composition of the types of catch, both main and by-catch (Pamenan, 2017). In addition, purse seine is also classified as a fishing gear that has a low level of selectivity (Rambun *et al*., 2016).

Fishing activities that are carried out continuously without realizing the availability of fish resources will decrease, so the selectivity of fishing gear and environmentally friendly fishing activities must also be considered so that the availability of fish resources is always there. Therefore, researchers feel the need to study the level of selectivity and environmental friendliness of purse seine fishing gear in order to maintain the availability of fish resources sustainably for the future in the Kupang Bay Waters of East Nusa Tenggara.

This study aims to determine the level of selectivity and environmental friendliness of purse seine fishing gear operated by fishermen in Kupang Bay Waters. The research method is descriptive. The number of respondents is 30 purse seine fishermen, which are then analyzed using the Shannon Diversity Index formula to calculate selectivity, and 9 CCRF (Code of Conduct for Responsible Fisheries) criteria to calculate the level of environmental friendliness of fishing gear.

RESEARCH METHODS

The research was conducted from November to December 2023 in the waters of Kupang Bay, East Nusa Tenggara. The research method used is a quantitative descriptive method focused on efforts to describe the phenomena in the field accurately and objectively without influencing or manipulating the variables studied. Where this study analyzes the selectivity of purse seine fishing gear by identifying the types of fish and the amount of catch, and identifying the level of environmental friendliness of purse seine fishing gear based on CCRF criteria. Data analysis used to determine the level of selectivity of fishing gear using the Shannon Diversity Index formula is calculated using the following formula (Kartawijaya *et al.,* 2011):

$$H' = -\sum_{i=1}^{s} Pi * Ln(Pi); \quad Pi = \frac{ni}{N}$$

description:
H': Index diversity
Pi: Proportion species caught
ni : Number of individuals species caught
N : Total number of species caught
Criteria mark index Shannon diversity
H' ≈ 0: Diversity low ; selectivity of fishing gear tall
H' > 0.1: Diversity high ; selectivity of fishing gear low .

To see the level of environmental friendliness of the purse seine fishing gear, researchers used 9 criteria of the Code of Conduct for Responsible Fisheries (CCRF) based on FAO 1995, explained in Table 1, below:

Table 1. Criticism Tool Catch Friendly Environment

NO	CRITERIA	EXPLANATION	WEIGHT
1	Has high selectivity	The fishing gear is attempted to only catch fish/other organisms that are the target of the fishing. There are two types of selectivity that are sub-criteria, namely size selectivity and species selectivity. These sub-criteria consist of:	
		✓ Gear that catches more than three species with very different sizes	1
		✓ Gear that catches three species with very different sizes	2
		✓ Gear that catches less than three species with more or less the same size	3
		✓ Gear that catches only one species with more or less the same size	4
2	Does not damage the habitat, where fish or other organisms live and breed.	The criteria are determined based on the area and level of damage caused by TPI, with the following weighting:	
		✓ Causes habitat destruction in a large area.	1
		✓ Causes habitat destruction in a narrow area	2
		✓ Causes some habitat in a narrow area	3
		✓ Safe for habitat (does not damage habitat)	4
3	Does not harm fishermen (fish catchers)	Human safety is a requirement for fishing, because humans are an important part of the sustainability of productive fisheries. Risk weighting is applied based on the level of danger and impact that may be experienced by fishermen, namely:	
		✓ gear and how it is used can result in death for fishermen	1
		✓ Fishing gear and its use can result in permanent disability for fishermen.	2
		✓ Fishing gear and its use can result in temporary health problems.	3
		✓ Safe fishing gear for fishermen	4
4	Produces fish that good quality	The quality level of fish is determined based on the morphological condition of the catch (its shape), with weighting:	
		✓ Dead and rotten fish	1
		✓ Dead, fresh and physically defective fish	2
		✓ Fresh dead fish	3
		✓ Live fish	4
5	The product does not harm consumer health	Fish caught with bombs, chemical fertilizers or cyanide poison are likely contaminated with toxins. The weighting of the criteria is determined based on the level of danger that consumers may experience, namely:	

NO	CRITERIA	EXPLANATION	WEIGHT
		✓ Has a high chance of causing death	1
		✓ Potential to cause health problems for consumers	2
		✓ Very small chance of harming consumer health	3
		✓ Safe for consumers	4
6	The catch that minimum waste	Non-selective fishing gear results in wasted catches. will increase, because many non-target species are also caught. The results non-target catches, some of which can be utilized and some of which cannot. The weighting of these criteria is determined based on the following:	
		✓ By-catch consists of several types (species) that are not sold on the market.	1
		✓ by-catch consists of several types and some are sold in the market	2
		✓ by-catch less than three types and sells well in the market	3
		✓ by-catch is less than three types and has high value in the market	4
7	Fishing gear that used must make an impact minimum against diversity of resources biodiversity	The weighting of these criteria is determined based on the following:	
		✓ Fishing gear and its operations cause the death of all living creatures and destroy habitats.	1
		✓ Fishing gear and its operations cause the death of several species and damage habitats.	2
		✓ Fishing gear and its operations cause the death of some species but do not damage habitat.	3
		✓ Safe for the diversity of biological resources	4
8	Do not catch species that are protected by law or endangered.	The level of danger of fishing gear to species protected by law determined based on the fact that:	
		✓ Fish protected by law are often caught by fishing gear.	1
		✓ Fish protected by law have been caught several times by fishing gear	2
		✓ Protected fish once caught	3
		✓ Protected fish are never caught	4
9	Socially accepted	Public acceptance of a fishing tool will depend greatly on social, economic, and cultural conditions in a place. A tool is accepted universally social by the community if: (1) investment costs are cheap, (2) it is profitable in terms of economy, (3) does not conflict with local culture, (4) does not conflict with with existing regulations. The weighting of the criteria is determined by assessing the reality on the ground is that:	
		✓ Fishing gear meets one of the four points of the statement above	1
		✓ Fishing gear meets two of the four points in the statement above	2

NO	CRITERIA	EXPLANATION	WEIGHT
		✓ Fishing gear meets three of the four points in the statement above	3
		✓ The fishing gear meets all the points of the statement above	4
		Total score	36

Source : FAO 1995

Furthermore determination classification and determination the criteria use formula formulation (Devi *et al* ., 2019):

$$\bar{X} = \sum_{i=1}^{N} \frac{Xi}{N} \; atau \; \bar{X} = \frac{\sum Xn}{N}$$

Description:
$\bar{X}$: The level of environmental friendliness of a fishing gear
Xi: Total weight mark
N: Total respondents

Table 2. Classification Criteria environmental friendliness

No	Category Environmental friendliness	Score Value (X)
1	Environmentally Friendly	X > 31.5
2	Less Environmentally Friendly	22.5 < X ≤ 31.5
3	Not Environmentally Friendly	13.5 < X ≤ 22.5
4	Damaging the Environment	X ≤ 13.5

Source : *Devi et al. , 2019*

RESULTS

Composition of Fish Types Caught

The results of the identification of fish caught by purse seine for 2 months, namely November 2023 with 22 trips and December 2023 with 15 trips with ship sizes ranging from 6GT-30GT, showed that the purse seine fishing gear obtained 13 species, with a total catch of 295,224 kg, explained in Table 3 below:

Table 3. Number of Catches *Purse Seine* In The Gulf Waters Kupang

No	Types of Fish	November Catch (Kg)	Catch Results December (Kg)	Total (Kg)
1	Tuna	7,423	-	7,423
2	Tongkol	20,330	8,050	28,380
3	Tembang	6,990	1,900	8,890
4	Nippi	4,500	-	4,500
5	Lajang	63,350	31,220	94,570
6	Kombong	1,050	-	1,050
7	Golo Golo	500	-	500
8	Gergahing	870	-	870
9	Skipjack Cakalang	63,909	25,800	89,709

No	Types of Fish	November Catch (Kg)	Catch Results December (Kg)	Total (Kg)
10	Baby Tuna	54,405	-	54,405
11	Manok	1,900	-	1,900
12	Cendro	-	1,550	1,550
13	Julung-Julung	-	1,477	1,477
TOTAL		**225.227**	**66,997**	**295,224**

Source : Processed research data, 2024.

The main catch of Purse seine in Kupang Bay waters is Single Fish (Decapterus spp) and the most dominant caught with a total weight of 94,570 kg and the others are by-catch.

Table 4 presents the percentage of the main and side catches of purse seine fishing gear in Kupang Bay Waters.

Table 4. Percentage of Main and By-catch Results from Purse Seine Fishing Gear in Kupang Bay Waters.

Catch main	November Catch (Kg)	Catch Results December (Kg)	Total
Lajang Fish	63,350	31,220	94,570
%	67%	33%	32%
Bycatch	November Catch (Kg)	Catch Results December (Kg)	Total
Table 3	161,877	38,777	200,654
%	80.67%	19.32%	68%

Source : Processed research data , 2024.

The percentage of main catch (Lajang Fish) was lower at 67% in November compared to bycatch at 80.67%, but in December the percentage of main catch was higher at 33% compared to bycatch at only 19.32%.

The results of the study showed that purse seine fishing gear tends to catch more or less target fish (main-catch) compared to bycatch, depending on fish availability, migration patterns, especially target fish such as mackerel. This study was conducted in a tropical area that has multi-species fisheries characteristics, meaning that this area is inhabited by various types of marine biota. In addition, the size of the mesh also has an effect. According to Rambun *et al.* (2017), the size of the mesh used in fishing with a purse seine allows various types of fish to be caught.

Analysis of Fishing Gear Selectivity Level

Diversity Index of catches *Purse Seine* During the research conducted in November and December , there were variation in the results . Index diversity highest recorded in November with a value of H' = 1.67 , while the lowest Diversity Index was in December with a value of H' = 1.24 . This can be seen in Figure 1 below:

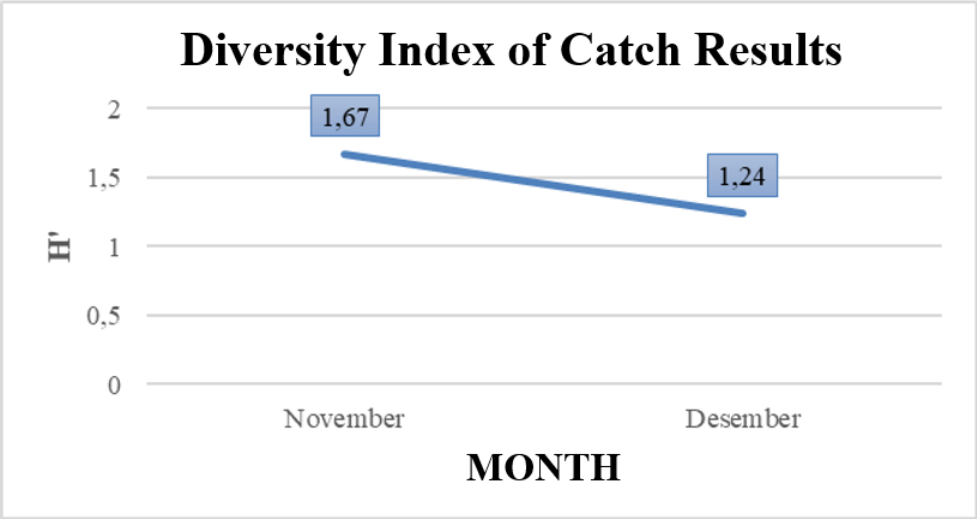

Figure 1. Index Diversity of Purse Seine Catches in Gulf Waters Kupang .

Environmental Friendliness Level

Analysis results level environmental crowding of fishing gear *Purse seine* uses 9 CCRF criteria explained in Table 4 below:

Table 5. Analysis of the Level of Crowded Fishing Gear Environment *Purse seine* in the Gulf Waters Kupang.

No	Criteria	Sub Criteria	Weight	Rspnd	Score (Total Rspnd X Weight)
1	Has High Selectivity	Catching more than three species of fish with different size variations	1	10	25
		Catching three or less species of fish with very different size variations	2	0	0
		Catching less than three species with approximately the same size	3	3	6
		Catching only one species with approximately the same size	4	17	4
		Amount		**30**	**87**
2	Does not damage the habitat, home and breeding place of fish or other organisms	Causes habitat destruction in a large area.	1	0	0
		Causes habitat destruction in a narrow area	2	0	0
		Causes some habitat in a narrow area	3	1	3
		Safe for habitat (does not damage habitat)	4	29	116
		Amount		**30**	**119**

No	Criteria	Sub Criteria	Weight	Rspnd	Score (Total Rspnd X Weight)
3	Does not endanger fishermen	Fishing gear and how it is used can result in death for fishermen	1	0	0
		Fishing gear and how it is used can result in permanent disability for fishermen	2	1	2
		Fishing gear and how it is used can result in temporary health problems	3	1	3
		Safe fishing gear for fishermen	4	28	112
		Amount		**30**	**117**
4	Produces good quality fish	Dead and rotten fish	1	0	0
		Dead fish, fresh and physically defective	2	2	4
		Fresh dead fish	3	28	84
		Live fish	4		0
		Amount		**30**	**88**
5	Products do not endanger consumer health	High chance of causing death	1	0	0
		High chance of causing consumer health problems	2	0	0
		Very small chance of causing consumer health problems	3	0	0
		Safe for consumers	4	30	120
		Amount		**30**	**120**
6	Minimum wasted catch	By-catch consists of several types (species) that are not marketable	1	0	0
		by-catch consists of several types and some are marketable	2	26	52
		by-catch is less than three types and marketable	3	1	3
		by-catch is less than three types and has a high market value	4	3	12
		Amount		**30**	**67**
7	The fishing gear used must have a minimum impact on the	Fishing gear and its operations cause the death of all living things and damage the habitat	1	0	0
		Fishing gear and its operations cause the death of several	2	0	0

No	Criteria	Sub Criteria	Weight	Rspnd	Score (Total Rspnd X Weight)
	diversity of biological resources (biodiversity).	species and damage the habitat			
		Fishing gear and its operations cause the death of several species but do not damage the habitat	3	0	0
		Safe for the diversity of biological resources	4	30	120
		Amount		**30**	**120**
8	Do not catch species that are protected by law or endangered.	Fish protected by law are often caught by gear	1	0	0
		Fish protected by law are caught several times by gear	2	0	0
		Protected fish have been caught	3	1	3
		Protected fish have never been caught	4	29	116
		Amount		**30**	**119**
9	Socially accepted	Fishing gear meets one of the four points of the statement above	1	0	0
		Gear The catch meets two of the four points of the statement above	2	0	0
		The catch meets three of the four points of the statement above	3	0	0
		The catch meets all of the points of the statement above	4	30	120
		Amount		**30**	**120**
	Total score		**36**		**957**
	Environmentally Friendly Criteria				**26.58333**

Source : Processed data , 2024.

DISCUSSION

Composition of Fish Types Caught

During the research period, Skipjack Tuna (*Katsuwonus pelamis*) was the second most dominant catch, followed by baby tuna fish in November 2023 for the by-catch category, and in December 2023 the dominant catch was single fish (*Decapterus* spp). According to Simajutak (2018), the lajang fish season takes place every month and peaks in November and December.

The many types of catches using purse seine are due to several factors: 1) Related to the characteristics of fisheries in tropical areas which are multi-species, where various types of

marine biota inhabit the area, 2) The very small mesh size in purse seine fishing operations, which allows other types of fish and small fish to be caught, and 3) Similarity of habitat between target and non-target fish, which contributes to the diversity of catches. (Rambun *et al*., 2016).

The composition of purse seine catches in the Kupang Bay area consists of skipjack tuna (*Katsuwonus pelamis*), baby tuna (*Baby thunus*), tuna (*Euthynu affinis*), tuna (*Thunus* spp), tembang fish (*Sardinella*), nipi (*Hemiramphus* sp), lajang fish (*Decapterus* spp), kombong fish (*Rastrelinger*), Golo-golo fish, Gergahing fish (*Caranx ignobilis*), Manok Fish (*Tylosurus crocodilus*), Cendro Fish (*Tylosurus crocodilus*), Julung-julung Fish (*Hemiramphus brasiliensis*). According to Tahir (2020), purse seines are a more efficient fishing tool for catching small pelagic fish around the surface of the water.

Analysis of Fishing Gear Selectivity Level

Figure 1 means that the index value obtained is more than 0.1 (H '> 0.1) then the purse seine fishing gear in Kupang Bay Waters is classified as a fishing gear with a high level of diversity and low fishing gear selectivity with an average diversity index value of 1.45. The results of the study by Aisyaroh *et al* (2021) stated that the Purse Seine managed to catch 18 species with varying total catches, where the number of fish species caught showed a high level of diversity but low selectivity, with a value of 1.55 in November 2020, 0.89 in December 2020, and 0.77 in January 2021). According to Rambun et al (2016) the purse seine fishing gear is classified as a fishing gear that has a low level of selectivity because it catches 14 types of species with a total catch of 75,945 fish weighing 9,092 kg. The composition of bycatch is more dominant, namely 78.7% compared to the main catch of 21.3%.

In line with Masrifatul's research (2021) that the level of selectivity of the purse seine fishing gear, based on the number of fish species caught, is included in the category of high diversity but with low selectivity, with a value of 1.55 in November 2020, 0.89 in December 2020, and 0.77 in January 2021. In terms of environmental friendliness, this tool is categorized as less environmentally friendly with a score of 28.298. Compared to the Gil Net fishing gear, the results of the study (Alinda et all, 2015) that the comparison between the millennium gill net and the ordinary gill net (2.0 inches) shows that the two fishing gears have almost the same length category, namely 18.28 ± 0.707951 for the millennium gill net and 18.78 ± 0.92655 for the ordinary gill net.

Environmental Friendliness Level

Analysis results during the research based on the 9 FAO criteria (1995) are as follows:

1. Has high selectivity

Selectivity criteria with a percentage value of 56.67% of respondents' answers that the purse seine fishing gear catches only one species with more or less the same size, 33% answered more than three species of fish with different sizes and 10% answered less than three species with more or less the same size, this shows that the purse seine fishing gear has low selectivity because it uses a small mesh size of 0.6-1 inch on the bag section so that the size of the fish caught varies from small to large, catching 13 types of fish caught consisting of one main type of fish, while other fish are included in the category of bycatch. According to Prayitno *et al*. (2017), purse seines that use the fish chasing method usually produce catches with uniform sizes and types, because this tool catches fish that swim in schools. Conversely, purse seines that use auxiliary tools tend to produce more diverse catches both in terms of type and size.

2. Does not damage the habitat

The criteria of not damaging the habitat obtained a percentage of 96.67% of respondents, indicating that the purse seine fishing gear is considered safe for fish habitat. Purse seine is

designed to catch pelagic fish on the sea surface, with a net height of around 30-40 meters, while the water depth ranges from 50-60 meters, so that this tool does not touch the seabed. This is in line with the opinion of Setyasmoko & Budi (2015) who stated that this operating technique does not damage the habitat, either in narrow areas, wide areas, or in coral reef habitats on the seabed.

3. Does not endanger fishermen

The criteria of not endangering fishermen obtained a percentage of 93.33%, which indicates that the use of purse seine fishing gear in Kupang Bay Waters is generally safe for fishermen, although some risks of temporary health problems still exist, such as minor injuries, sprains, or being cut by ropes during the net pulling process (hauling) because it is still done manually. According to Rusmilyansari (2012), this is due to the use of fishing gear that is still operated manually. Radarwati *et al*. (2010), also added that the level of danger experienced by fishermen when operating fishing gear is greatly influenced by the type of gear used and the skills of the fishermen.

4. Producing high-quality fish

The criteria for producing high-quality fish obtained a percentage of 93.33%, indicating that most of the catch consisted of fresh dead fish, although some died fresh but were deformed. Based on the level of freshness, this catch is classified as high quality, although some types of fish have a meat texture that is easily damaged. To maintain the freshness of the fish, ABK (ship's crew) usually handles the catch by storing it in a ship equipped with ice, in order to maintain the quality of the fish during the journey to the market.

5. Production does not endanger consumers.

The criteria for production that is safe for consumers received a percentage value of 100%, indicating that the composition of the catch obtained by purse seine fishermen is safe for consumption. In addition, there were no complaints from consumers regarding the consumption of the fish.

6. Low by-catch

The criteria for low by-catch received a percentage value of 86.67%, indicating that the catch of fishermen in the Kupang Bay Waters consists of several species and is marketable.

7. Impact on Biodiversity

The impact criteria on biodiversity received a percentage value of 100%, indicating that the catch from the purse seine does not endanger biodiversity. This can be seen from the operating technique of the purse seine fishing gear carried out on the surface of the sea, so that it does not cause damage to marine ecosystems, such as coral reefs.

8. Does not endanger protected fish.

The criteria indicating that there is no danger to protected fish received a percentage value of 96.67%. This shows that the purse seine fishing gear in the Kupang Bay Waters has caught protected fish. Several types of protected marine biota that have been caught by the purse seine fishing gear include dolphins and stingrays. However, usually if the dolphin is caught alive, one of the crew will immediately release it from the fishing gear.

9. Socially acceptable

The socially acceptable criteria received a percentage value of 100% indicating that the use of the purse seine fishing gear does not conflict with existing regulations, both government regulations and local customs.

The analysis results obtained scores from respondents' assessments resulted in purse seine As a fishing gear that is classified as less environmentally friendly, it is suspected that the criteria score indicates high selectivity, which is the lowest among the other criteria of the nine (9) criteria analyzed. In addition, the types of fish caught are more than three (3 species/types) of fish, which means that the selectivity of the types is diverse (low selectivity).

The results of the environmental friendliness analysis based on the 9 FAO criteria (1995) in Kupang Bay Waters obtained a score of 26.58. The value obtained shows that the purse seine in Kupang Bay Waters is categorized as a fishing gear that is Less Environmentally Friendly ($22.5 < X \leq 31.5$). The criteria that need to be considered so that the purse seine fishing gear can be more environmentally friendly are the selectivity and by-catch criteria, which have lower values compared to other criteria.

Research by Fadli *et al.* (2020), that Based on the results of the analysis carried out, the composition of the catch from the purse seine fishing gear consists of 19 types of fish. The highest composition is komo tuna, which reaches 23.8% or 67,300 kg, while the lowest composition is grouper as much as 0.002% or 5 kg. In addition, the level of environmental friendliness of the purse seine fishing gear is classified as less environmentally friendly, with a total scoring value of 29.

The results of research by Masrifatul *et al*. (2021), show that the analysis of the level of selectivity of the purse seine fishing gear, based on the number of fish species caught, is included in the category of high diversity with low selectivity, with values of 1.55 (November 2020), 0.89 (December 2020), and 0.77 (January 2021). In addition, the level of environmental friendliness of this fishing gear is included in the less environmentally friendly category, with a score of 28.298.

CONCLUSION

Based on the results of this study, it can be concluded that the purse seine fishing gear operated in the waters of Kupang Bay has results obtained during the study of more than 0.1 ($H' > 0.1$), which indicates that this fishing gear has low selectivity. This can be seen from the results obtained in November 2023 with a value of $H' = 1.67$, and December 2023 with a value of $H' = 1.24$. An index value of more than 0.1 ($H' > 0.1$) indicates that the purse seine fishing gear in the waters of Kupang Bay is classified as a fishing gear with a high level of diversity and low selectivity. In addition, the level of environmental friendliness of the purse seine fishing gear scored 26.58, indicating that this fishing gear is categorized as less environmentally friendly ($22.5 < X \leqslant 31.5$).

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REFERENCE

Aisyaroh, M., Zainuri, M., Pertanian, F., Manajemen, P., Perairan, S., Madura, U. T., Telang, J., Universitas, K., & Madura, T. (2021). (Selectivity Of Purse Seine In Pasongsongan Waters of Sumenep) Keywords: Purse Seine , Fishing Catch , Selectivity Purse seine merupakan sejenis alat tangkap multi spesies yang menangkap beberapa jenis ikan dan digolongkan ke dalam bawah jaring berbent. *Journal of Fisheries and Marine Research, 5*(3), 604–616.

Dewanti, L. P., Sienna, Y. I., Khan, A., Apriliani, I. M., & Herawati, H. (2020). Selektivitas Gillnet Yang Menangkap Sumberdaya Ikan Layur (Trichiurus lepturus) Di Kabupaten Pangandaran. Albacore *Jurnal Penelitian Perikanan Laut*, 3(3), 273–281.

https://doi.org/10.29244/core.3.3.273-281

Damayanti, H. O. (2020). Produktivitas Perikanan Tangkap Jaring Purse Seine. *Jurnal Litbang, 16*(1), 29–46.

Dinas Kelautan dan Perikanan Nusa Tenggara Timur. 2019, Potensi Lestari Perikanan Provinsi NTT.

Eri Fadli, Edy Miswar , Alvi Rahmah , Muhammad Irham , Adli Waliul Perdana. 2020. Tingkat Keramahan Lingkungan Alat Tangkap Purse Seine Di Ppi Sawang Ba'u Kabupaten Aceh Selatan.. *Jurnal Ilmiah Mahasiswa Kelautan dan Perikanan Unsyiah*. 3 (5). 1-10.

Fitriany, D., Hamzah, A., & Wianti, N. (2019). Studi Modernisasi Nelayan di Kota Kendari (Studi Kasus Armada Purse Seine di Pelabuhan Perikanan Samudera Kendari). *Jurnal Ilmiah Membangun Desa Dan Pertanian, 4*(2), 29–34.

Food Agriculture Organization, 1995. Code of Conduct for Responsible Fisheries (CCRF) tahun 1995.

Kartawijaya, T., Ardani1, Eddy, H., Didin, K., Arinto, K. J., Imanuel, M. T., Suri, P. F., Iwan, D., Soraya, G., Stylia, J., dan Kaharuddin, S. (2011). Analisis Tingkat Keramahan Lingkungan Alat Tangkap Trammel Net di Teluk Palabuhan Ratu. *Jurnal Buletin PSP*. 12 (3): 253 – 266.

Masrifatul Aisyaroha, Muhammad Zainuria. 2021. Selektivitas Alat Tangkap Pukat Cincin (Purse Seine) Di Perairan Pasongsongan Sumenep (Selectivity Of Purse Seine In Pasongsongan Waters of Sumenep). *Journal of Fisheries and Marine Research* Vol 5 No.3 (2021) 604-616.

Pamenan, A. R., Sunarto, S., & Nurruhwati, I. (2017). Selektivitas alat tangkap purse seine di Pangkalan Pendaratan Ikan Muara Angke. *Jurnal Departemen Perikanan*, 6(2), 100–105. https://doi.org/10.13170/depik.6.2.5381

Prayitno, M.R.E., J.I. Menengkey., M. Zaini. (2016). Manfaat dan Dampak Penggunaan Rumpon sebagai Alat Bantu dalam Penangkapan Ikan. *Buletin Matric, 13*(2): 34-41.

Radarwati S., M.S. Basoro., D.R. Monintja dan A. Purbayanto. (2010). Alokasi Optimum dan Wilayah Pengembangan Berbasis Alat Tangkap Potensial Teluk Jakarta. *Jurnal Teknologi dan Mnajemen Perikanan Laut. 1* (2): 189-198.

Rambun, A., Sumarto, dan I. Nurruhwati. 2016. Selektivitas Alat tangkap Purse Seine di Pangkalan Pendaratan Ikan (PPI) Muara Angke Jakarta. *Jurnal Perikanan Kelautan. 7*(2): 97-102.

Rusmilyansari. 2012. Inventarisasi Alat Tangkap Berdasarkan Kategori Status Penangkapan Ikan yang Bertanggungjawab di Perairan Tanah Laut. *Fish Scientiae. 2* (4): 141-151.

Setyasmoko & Budi. T. 2015. Kesesuaian Teknis Rasio Gaya Apung (*Bouyance Force*) dan Gaya Tenggelam (*Sinking Force*) pada Pukat Cincin (*Purse Seine*) Tipe Waring di TPI Sendang Sikucing, Kabupaten Kendal [*Skripsi*]. Universitas Diponegoro. Semarang.

Suharyanto, Saputra, R. S. H., Mufid, M. A., & Sutono, D. (2020). Analisis Usaha Perikanan Purse Seine di Perairan Kendari, Provinsi Sulawesi Tenggara. Pelagicus*: Jurnal Iptek Terapan Perikanan Dan Kelautan, 1*(1), 21–29.

Supriadi, D., Saputra, A., Yeka, A., & Heryanto. (2021). Produksi Dan Komposisi Hasil Tangkapan Purse Seine Waring Di Pelabuhan Perikanan Pantai (Ppp) Bondet Kabupaten Cirebon Production And Composition Of Purse Seine Waring Catch At The Bondet Coastal Fishing Port (Ppp) Cirebon Regency Pendahuluan Sumberda. *Jurnal Akuatek, 2*(1), 7–18.

Tambunan SBS dan Agustriani F. 2010. Selektivitas Drift Gillnet pada Ikan Kembung Lelaki (Rastrelliger kanagurta) Di Perairan Belawan Pantai Timur Sumatera Utara Provinsi Sumatera Utara. *Maspari Journal: Marine Science Research. 1*(1):63-68.