

COMPOSITION OF THE NEW DESIGN OF PAYANG CATCHES IN MAJENE WATERS, MAKASSAR STRAIT

Komposisi Jenis Tangkapan Payang Desain Baru di Perairan Majene, Selat Makassar

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ABSTRACT

This research was intended to assess the performance of a newly designed Scottish seine net that is larger than the one commonly used at the research location. The aim of this research is to analyze the total catch, species composition and length of the catch. The research was carried out by testing new design of Scottish seine net which was operated by local fishermen in the Majene waters of the Makassar Strait. The parameters observed were the types of species caught and the length of each type of species. The results showed that the catch consisted of 8 species of fish with a total of 15,253 individuals. The composition of the catch consisted of Shortfin scad (*Decapterus macrosoma*) 66.48%, Indian mackerel (*Rastrelliger kanagurta*) 14.42%, Rainbow runner (*Elagatis bipinnulata*) 7.09%, Mackerel tuna (*Euthynnus affinis*) 3.83%, Malabar trevally (*Carangoides malabaricus*) 2.39%, Unicorn leatherjacket (*Aluterus monoceros*) 2.29%, Skipjack tuna (*Katsuwonus pelamis*) 2.19% and Goldstripe sardinella (*Sardinella gibbosa*) 1.31%. Based on measurements of the length of the catch, the results showed that the length of the Shortfin scad (*Decapterus macrosoma*), which is the dominant fish species, ranged from 12.5 – 27 cm with a catchable percentage of 82.53%. Meanwhile, the length of Indian mackerel (*Rastrelliger kanagurta*), as the second largest catch, ranges from 11.7 – 23.5 cm with the percentage of fish worth catching is 2.64%.

Keywords: catches, new design, scottish seine net, species composition.

ABSTRAK

Penelitian ini dimaksudkan untuk menguji coba payang desain baru yang berukuran lebih besar dari yang umum digunakan di lokasi penelitian. Tujuan penelitian ini adalah menganalisis total hasil tangkapan, komposisi jenis dan ukuran panjang hasil tangkapan menggunakan payang desain baru. Data diambil dari pengoperasian satu unit alat tangkap payang desain baru yang dilakukan oleh nelayan payang di perairan Majene Selat Makassar. Parameter yang diamati adalah jenis-jenis spesies hasil tangkapan dan ukuran panjang dari masing-masing jenis spesies tersebut. Hasil penelitian menunjukkan bahwa hasil tangkapan terdiri dari 8 spesies ikan dengan total individu 15.253 ekor. Komposisi hasil tangkapan terdiri dari Shortfin scad (*Decapterus macrosoma*) 66,48%, Indian mackerel (*Rastrelliger kanagurta*) 14,42%, Rainbow runner (*Elagatis bipinnulata*) 7,09%, Mackerel tuna (*Euthynnus affinis*) 3,83%, Malabar trevally (*Carangoides malabaricus*) 2,39%, Unicorn leatherjacket (*Aluterus monoceros*) 2,29%, Skipjack tuna (*Katsuwonus pelamis*) 2,19% dan Goldstripe sardinella (*Sardinella gibbosa*) 1,31%. Berdasarkan pengukuran panjang hasil tangkapan, didapatkan hasil bahwa panjang Shortfin scad (*Decapterus macrosoma*), yang merupakan jenis ikan yang dominan, berkisar antara 12,5 – 27 cm dengan persentase layak tangkap 82,53%. Sementara

itu, panjang *Indian mackerel* (*Rastrelliger kanagurta*), sebagai hasil tangkapan terbanyak kedua, berkisar antara 11.7 – 23.5 cm dengan persentase ikan yang layak tangkap adalah 2,64%.

Kata kunci: Payang, desain baru, tangkapan, komposisi spesies.

INTRODUCTION

Scottish seine net, according to the Decree of the Minister of Marine Affairs and Fisheries Number: Kep.06/Men/2010 concerning Fishing Equipment in the Fisheries Management Area (FMA) of the Republic of Indonesia, including the group of Seine nets with the type of boat or vessel seines, fishing gear group is intended for pelagic shoaling fish. Based on the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia number: 02/Permen-KP/2015 that the trawls and seine nets, including Scottish seine nets, are prohibited from being used based on considerations that have resulted in a decline in fish resources and threaten the environmental sustainability of fish resources.

The ban is not accepted by most people, especially fishermen in West Sulawesi. Najamuddin *et al.* 2020 revealed that fishermen who operate payang at a distance of up to 20 miles from the coast and at a depth of thousands of meters do not agree with this. conditions are very different from the payang fishing areas operated by fishermen on the north coast of Java and other areas.

The construction of the Scottish seine net as a fishing gear has many variations in the size of the net in each section, such as the Scottish seine net operating in the Mamuju waters of West Sulawesi with a mesh size of the wings 25-60 cm, body 15-30 cm and cod ends 1.5-5 cm (Najamuddin *et al.* 2019). Fishers use of nets with a small mesh size in the cod end will result in the catching of small fish, which are still juvenile and unfit for catching. The same thing also happened to the Scottish seine net fishery in the northern coastal areas of West Java and Central Java. Fishers who operate Scottish seine nets in both regionbaks use nets with mesh size in the more minor part of the cod-end, which is 0.5 cm of fishing material, with the main catch targets being *Fringescale sardinella*, Commerson's anchovies, and Spined anchovies in the waters of Karawang Regency (Akbar & Patria 2019), *Scottish seine net Ampera* and *Scottish seine net Genuine* which are operated by fishermen in Kendal Waters also use waring material on the cod-ends (Hakim *et al.* 2014; Wicaksono *et al.* 2014).

In order to minimize the catch of small juvenile fish that are not suitable for catching in a Scottish seine net, several cod-end modifications studies have been carried out, such as the installation of side windows in cod ends with larger mesh sizes (Wicaksono *et al.* 2014) and Anwar *et al.* (2014), another design with a change in the location of the windows installation, namely at the top of the cod-end surface (Hakim *et al.* 2014). In this study, a new design of the Scottish seine net was made by increasing the size of the scottish seine net and the mesh size in certain parts, both on the wings and the cod-end as shown in Figure 2. This study aims to analyze the results of the new design of payang catches, namely species composition, length size of the main catch and size worth catching.

METHODS

This research was conducted from December 2021 to February 2022 in the coastal waters of West and South Majene with the fishing base in Pangaliali Village, Banggae District, Majene Regency. Scottish seine net operations use FADs as fishing aids located at several coordinates in the fishing area, as shown in Figure 1. The fishing gear used in this study is a new design Scottish seine net which generally has a more enormous wingspan and cod-end circle. In some parts of the cod-end, the mesh size is also zoomed in (Figure 2).

This research method was a case study by operating a new design Scottish seine net unit with fishermen at several FAD coordinates as a fishing aid in Majene Waters, Makassar Strait. Parameters (data) observed were the number and types of catches of the new design catch as well as the length size of each type which was carried out on each fishing trip of 35 trips. Parameters (data) observed were the number and types of catches of the new design catch as well as the length size of each type which was carried out on each fishing trip of 35 trips. The species composition of the catch was analyzed based on Krebs 1999, while the size of the suitable species to catch refers to the length of the first gonad maturity in previous studies.

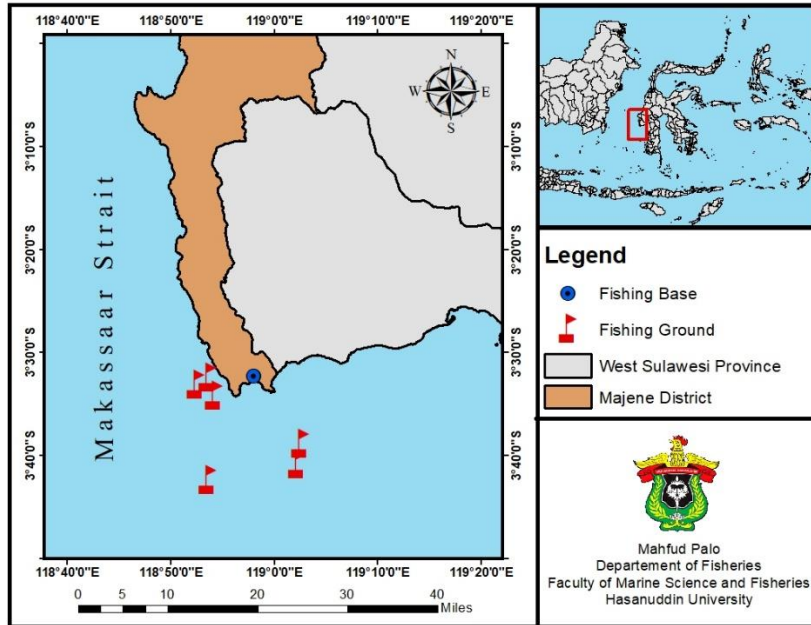


Figure 1 Map of FAD coordinate positions at fishing ground and fishing base Scottish seine net

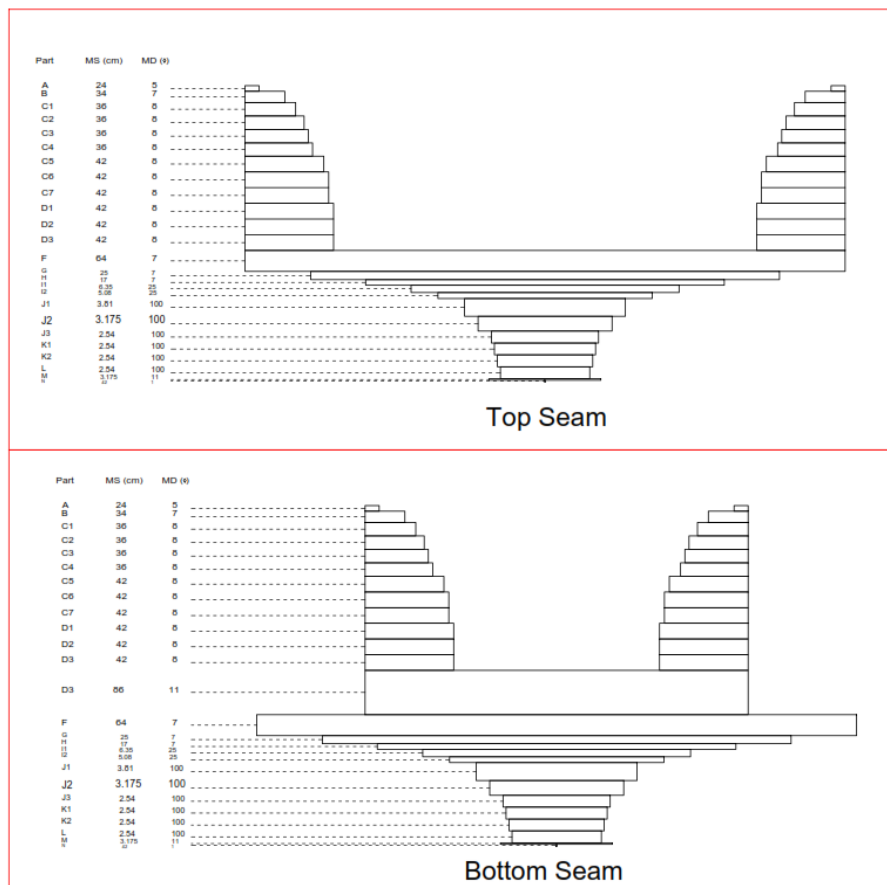


Figure 2 New design Scottish seine net used in this research

RESULTS

Fishing operations with the new design Scottish seine net were carried out for 35 trips from December 2021 to February 2022 during the west monsoon season. The catches

obtained consisted of 8 species of fish in the main cod-end, namely: Shortfin scad (*Decapterus macrosoma*), Indian mackerel (*Rastrelliger kanagurta*), Rainbow runner (*Elagatis bipinnulata*), Mackerel tuna

(*Euthynnus affinis*), Malabar trevally (*Carangoides malabaricus*), Unicorn leatherjacket (*Aluterus monoceros*), Skipjack tuna (*Katsuwonus pelamis*) and Goldstripe sardinella (*Sardinella gibbosa*) and the same five species in the outer cod end (cover net).

The total catch obtained during the study was 18,858 fish consisting of 15,253 fish (80.88%) in the main cod end and 3,605 fish (19.12%) in the cover net. The composition of the species caught in the main cod end was Shortfin scad (*Decapterus macrosoma*) 66.48%, Indian mackerel (*Rastrelliger kanagurta*) 14.42%, Rainbow runner (*Elagatis bipinnulata*) 7.09%, Mackerel tuna (*Euthynnus affinis*) 3.83%, Malabar trevally (*Carangoides malabaricus*) 2.39%, Unicorn leatherjacket (*Aluterus monoceros*) 2.29%, Skipjack tuna (*Katsuwonus pelamis*) 2.19% and Goldstripe sardinella (*Sardinella gibbosa*) 1.31% (Figure 3). while the composition of the usual payang catch from October to November at the same

fishing area is: Shortfin scad (*Decapterus macrosoma*) 70%, Bigeye scad (*Selar crumenophthalmus*) 14%, Skipjack tuna (*Katsuwonus pelamis*) 11%, Rainbow runner (*Elagatis bipinnulata*) 4% and Yellowstripe scad (*Selaroides leptolepis*) 1%.

Shortfin scad (*Decapterus macrosoma*) is the catch with the highest percentage (66.48%). Shortfin scad (*Decapterus macrosoma*) is the catch with the highest rate (66.48%), having a length distribution of 12.5 – 27 cm. The highest length frequency is between 20.0 – 21.4 cm, while the lowest is between 26.0 – 27.4 cm (Figure 4).

Indian mackerel (*Rastrelliger kanagurta*) is the second highest new design Scottish seine net catch after Shortfin scad with a percentage of 14.42% with the length between 11.7 – 23.5 cm. The length of the haul with the highest frequency is between 14.3 – 15.5 cm, and the lowest is 23.4 – 24.6 cm (Figure 5).

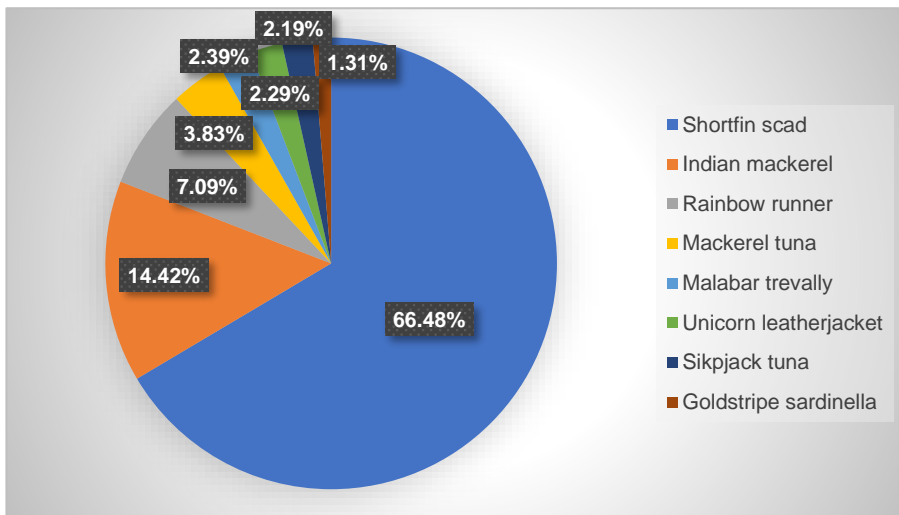


Figure 3 New design Scottish seine net catch composition

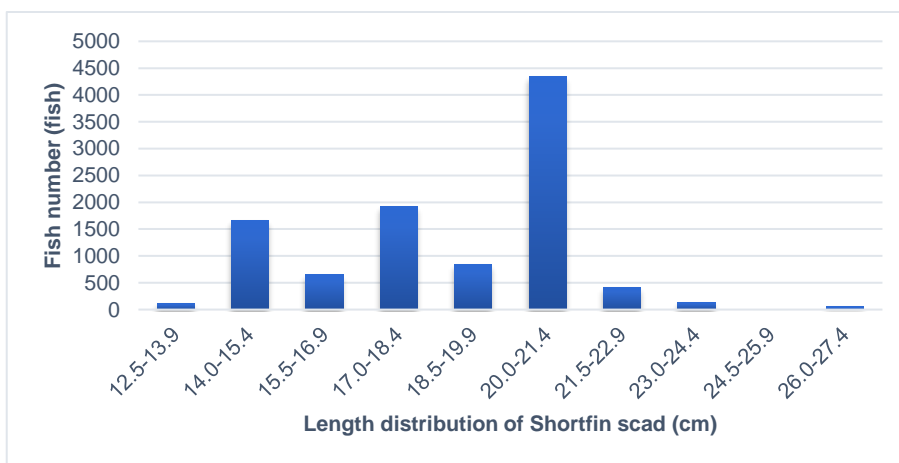


Figure 4 Length distribution of Shortfin scad (*Decapterus macrosoma*) caught by the Scottish seine net

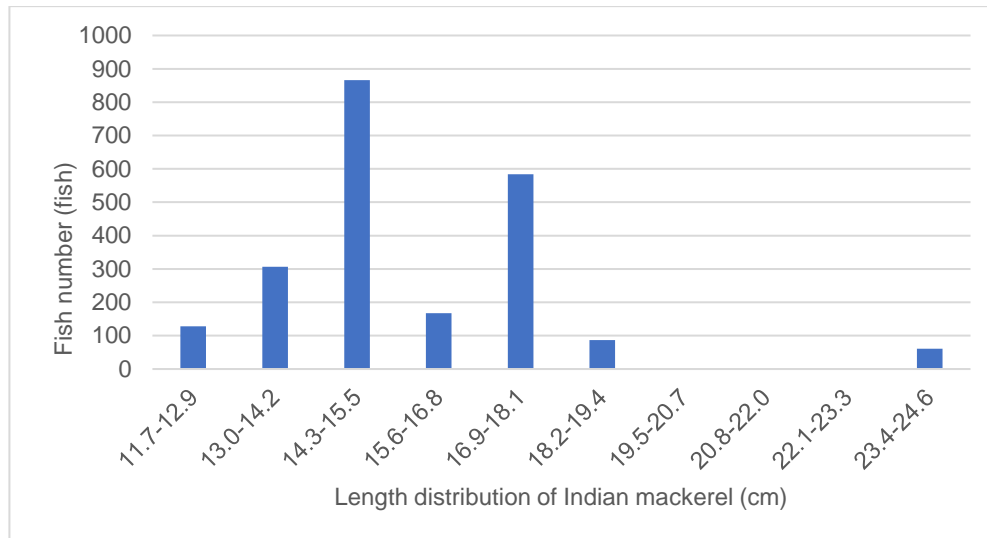


Figure 5 Length distribution of Indian mackerel (*Rastrelliger kanagurta*) caught by the Scottish seine net

DISCUSSION

The composition of this catch was very different from the Scottish seine net catch in the waters north of Karawang which catches small pelagics including Spined anchovy (*Stolephorus tri*), anchovies (Commerson's anchovy), Fringescale sardinella (*Sardinella fimbriata*), Savalai hairtail (*Lepturacanthus savala*), Yellowstripe scad (*Selaroides leptolepis*) and Indian mackerel (*Rastrelliger kanagurta*) with the highest catch percentage of 68%, demersal fish (Black pomfret, Black and white snapper) 22%, squid (squid) 6% and large pelagic fish (Narrow-barred Spanish mackerel, Mackerel tuna) and Malabar trevally) 4% (Akbar & Patria 2019). The difference in the composition of the catch species was thought to be due to differences in the conditions of the fishing area in Karawang waters including the shallow sea category compared to the Makassar Strait. This is also different from the Scottish seine net which operates in the waters of West Aceh by only catching five types of fish without any dominant catch species, namely Yellowtail fusilier (*Caesio cuning*) 21.8%, Razorbelly scad (*Alepeskalla*) 28.2%, Spotted sardinella (*Sardinella sirn*) 33.1% Sumatran silverside (*Hypoatherina valenciennesi*) 5.6% and Mackerel (*Rasterliger sp.*) 11.3% (Hafinuddin et al. 2017), while Scottish seine net catches are dominant in Gorontalo Bay waters in the dry season. West Java is Savalai hairtail (*Trichiurus savala*) as much as 69% (Asruddin et al. 2020).

The total main catch of the new design Shortfin scad (*Decapterus macrosoma*)

during research in Majene waters was 10 139 fish, 82.53% of which were suitable for catching based on the size of the first gonad maturity. 68 cm and females at 15.62 cm (Hasrun & Kasmawati 2021).

Total catch of Indian mackerel (*Rastrelliger kanagurta*) as many as 2200 (14.42%) at a length of 11.7 – 23.5 cm. Most of them were not deal for detecting or only about 2.64% were suitable for catching based on the size of the first maturity of the gonads. Indian mackerel (*R. kanagurta*) male 19.3 cm and female fish 17.7 cm (Putera & Setyobudiandi 2019), while Lubis et al. (2019) stated that the size of the first male Indian mackerel (*R. kanagurta*) caught in the Sunda Strait was 17.8 cm and the female was 16.9 cm. This indicates that most of the Indian mackerel (*R. kanagurta*) detected with the new design *Scottish seine net* in Majene Waters, Makassar Strait have not been reproduced to maintain the stock available. The new Scottish seine net design is made to pass small catches that are not suitable for catching by increasing the size of the mesh in some parts of the cod-end. The change in mesh size was good enough for the main catch target of Shortfin scad (*Decapterus macrosoma*) by obtaining 82.53% of the catchable catch, but not so with the bycatch of Indian mackerel (*R. kanagurta*) which only got 2.64% of the yield worth catching. This is presumably due to the more significant length of the Indian mackerel (*Rastrelliger kanagurta*) than the Shortfin scad (*Decapterus macrosoma*).

Table 1 Comparison of The Length Range of Shortfin Scad (*Decapterus macrosoma*) with Previous Studies

No	Range Length (cm)	Number (fish)	Reference
1	12.5-13.9	118	Najamuddin <i>et al.</i> 2021 (Scottish seine, range 14-25 cm with highest frequency 19-20 cm)
2	14.0-15.4	1653	Randongkir <i>et al.</i> 2018 (10.9 - 30.3 cm with the highest frequency range 16.4-18.1 cm)
3	15.5-16.9	653	Kusumaningrum <i>et al.</i> 2021 (14.7-35.1 cm)
4	17.0-18.4	1926	Jamal <i>et al.</i> 2021 (Purse seine, range 12-27 cm with highest frequency range 21.01-22.50 cm)
5	18.5-19.9	849	Mourniaty <i>et al.</i> 2021 (Purse seine, 11.0-20.8 cm with highest frequency range 17-17.9 cm)
6	20.0-21.4	4339	
7	21.5-22.9	413	
8	23.0-24.4	138	
9	24.5-25.9	0	
10	26.0-27.4	50	

Tabel 2 Comparison of the length range of Indian mackerel (*Rastrelliger kanagurta*) with previous research

No	Range Length (cm)	Number (fish)	Reference
1	11.7 – 12.9	128	Faizun <i>et al.</i> 2021 (range 13.0 - 26.0 cm with the highest frequency 16.1-17.5 cm)
2	13.0 – 14.2	307	Kasmi <i>et al.</i> 2017 (Hand line, range 17.1-25.3 cm)
3	14.3 – 15.5	866	Sinaga & Afriani 2020 (Gill net, range 16.5-19.0 cm with the highest frequency 18.3-18.8 cm)
4	15.6 – 16.8	167	Fauzi <i>et al.</i> 2020 (Purse seine, range 13.7-25.7 cm)
5	16.9 – 18.1	584	
6	18.2 – 19.4	87	
7	19.5 – 20.7	0	
8	20.8 – 22.0	0	
9	22.1 – 23.3	0	
10	23.4 – 24.6	61	

CONCLUSION

The species composition of the new design Scottish seine net catch is dominated by Shortfin scad (*Decapterus macrosoma*) as catch at as much as 66.48%, then Indian mackerel (*Rastrelliger kanagurta*) 14.42%, Rainbow runner (*Elagatis bipinnulata*) 7.09% and five other species respectively. Below 4%. Shortfin scad as the dominant catch is between 12.5 – 27 cm, and 82.53% of them are suitable for catching, while Indian mackerel as the second highest catch with a size range of 11.7 – 23.5 cm is only about 2.64% suitable for detecting.

RECOMMENDATIONS

Based on the results obtained, we recommend the use of a new Scottish net design for fishing in the Majene Waters in particular and the Makassar Strait in general.

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