IDENTIFICATION OF FISHING POTENTIAL FOR LOBSTER IN ACEH JAYA SEA WATERS

Identifikasi Daerah Penangkapan Lobster Di Perairan Aceh Jaya

Hafinuddin[1*], Iyan Al Misbah[1], Samsul Bahri[2], Heriansyah[3]

[1]Aquaculture Departement Teuku Umar University, [2]Marine Science Departement Teuku Umar University, [3]Aquatic Resources Departement Teuku Umar University

Alue Peunyareng Street, Ujong Tanoh Darat, West Aceh District, Indonesia

[*]Corresponding author: hafinuddin@utu.ac.id

ABSTRACT

The waters of Aceh Jaya Regency are included in fisheries management area (WPP) 572, where these waters are located on the west coast of Sumatra and have the potential for lobster fisheries. However, data and information regarding biological conditions, length and weight composition of lobsters caught, and even regarding potential lobster fishing areas in the Aceh Jaya region are still limited. The aim of this research is to identify fishing areas where lobsters live and identify the types of lobsters that are usually caught. This research was conducted at PPI Rigaih in the eastern season from April to May 2022. The research method was carried out using experimental fishing methods with data collection methods, namely interviews and observation. Based on the research results, it shows that the lobster catch obtained was sand lobster (Panulirus homarus) as much as 50%, bamboo lobster (Panulirus longipes) as much as 45%, and batik lobster (Panulirus longipes) as much as 5%. The fishing area has been identified at 04°37'45.99"- 04°39'03.53" north latitude and 095°31'27.37" - 095°32'37.70" east longitude, with seabed substrate conditions being coral sand and coral at depth water 5-10 meters. The results of this research are very important in the development of lobster fisheries in Aceh Jaya in particular and Indonesia in general.

Keywords: Fishing Area, Aceh Jaya Regency, Lobster, Substrate.

ABSTRAK

Perairan Kabupaten Aceh Jaya termasuk kedalam wilayah pengelolan perikanan (WPP) 572 yang mana perairan tersebut terdapat di bagian pantai barat Sumatera serta memiliki potensi perikanan lobster. Namun data dan informasi mengenai kondisi biologis, komposisi panjang dan berat lobster yang ditangkap, bahkan mengenai potensi daerah penangkapan lobster di wilayah Aceh Jaya masih terbatas. Tujuan penelitian ini adalah untuk mengidentifikasi daerah penangkapan dimana lobster hidup dan mengidentifikasi jenis lobster yang biasanya ditangkap. Penelitian ini dilakukan di PPI Rigaih pada musim timur bulan April sampai dengan Mei 2022. Adapun metode penelitian dilakukan dengan menggunakan metode *eksperimen fishing* dengan metode pengumpulan data yaitu wawancara dan observasi. Berdasarkan hasil

penelitian,menunjukkan bahwa hasil tangkapan lobster yang diperoleh adalah lobster pasir (*Panulirus homarus*) sebanyak 50%, lobster bambu (*Panulirus longipes*) sebanyak 45%, dan lobster batik (*Panulirus longipes*) sebanyak 5%. Daerah penangkapan telah diidentifikasi berada pada 04°37'45.99"- 04°39'03.53" lintang utara dan 095°31'27.37" - 095°32'37.70" bujur timur, dengan kondisi substrat dasar laut adalah pasir berkarang dan karang dengan kedalaman air 5-10 meter. Hasil penelitian ini sangat penting dalam pengembangan perikanan lobster di Aceh Jaya khususnya dan Indonesia pada umumnya.

Kata Kunci: Daerah Penangkapan Ikan, Kabupaten Aceh Jaya, Lobster, Substrat.

INTRODUCTION

Aceh Jaya Regency, astronomically located at coordinates 04022' - 05016' N and 04002' - 05016' E with an area of 3,814 km2. Aceh Jaya Regency is located in the northern part of Aceh, bordering Aceh Besar and Pidie Regencies. It borders the Indonesian Ocean and West Aceh Regency to the south, Pidie and West Aceh Regency to the east, and the Indonesian Ocean to the west. The population of Aceh Jaya Regency is 94,418 people (BPS Aceh Jaya Regency, 2022). Aceh Jaya Regency's marine fisheries production reached 5,980.9 tons. Marine fisheries production includes lobster production which reached 143 tons or the equivalent of IDR 42,900,000,000 (DKP Aceh Jaya Regency, 2020).

Lobsters are animals that live in water and have no backbone and hard skin and belong to the phylum arthropods (WWF, 2015). Lobsters are invertebrates from the Crustacea class, these animals have a hard carapace with 5 paired walking legs. In general, lobsters are aquatic animals, most of their habitat is in sea water, from an ecological perspective, one of which is that in the marine ecosystem food chain, lobsters play a very important role from the photic to aphotic zones. There are many species of crayfish with different developmental needs and lifestyles. Lobsters live on the underside of live and dead coral, in fine coral sand, and in rocky areas on coastal islands and bays (Idami, 2020). Market demand for lobster commodities is high, economically important and included as an export commodity (Anggraini *et al.,* 2021), so fishermen no longer pay attention to the preservation of lobster resources and the environment (Kembaren & Nurdin, 2015). The Ministry of Maritime Affairs and Fisheries regulations (2020) also create guidelines for the government or fishermen in realizing lobster management in Indonesia.

A fishing ground is an area where the population of a habitat can be found (utilized) and fishing gear can be operated. As a producer in the fisheries sector, the waters of Aceh Jaya Regency are included in fisheries management area (WPP) 572, where these waters are located on the west coast of Sumatra. Through a Decree (Ministry of Maritime Affairs and Fisheries, 2022) it is explained that WPP 572 has an estimated sustainable potential value (Maximum Sustainable Yield) for lobster of 2,722 tons with a Permissible Catch (JTB) of 0.5% or a sustainable potential of 1,361 tons and a utilization rate of 1.6%. The utilization of lobster commodities in WPP 572 has reached Fully-exploited, therefore fishing efforts are maintained with strict monitoring.

Aceh Jaya Regency, in its lobster fisheries, is still experiencing problems related to the utilization of its resources due to a lack of information from fisheries actors regarding lobster fishing efforts, the biological conditions of caught lobsters, length and weight composition, and even potential fishing areas for lobsters. Based on the problems described above, research is still needed on identifying fishing areas for sustainable lobster fisheries management in Aceh Jaya Regency. The research aims to identify fishing areas where lobsters are often caught and identify the types of lobsters caught.

METHODS

Research was carried out in the waters of Lhok Rigaih or at the Latitude line 04°37'45.99" - 04°39'03.53" N and Longitude 095°31'0.31" - 095°32'37.79"E (Figure 3) which lasted for 2 months in the east season (April to May 2022). Lobster fishing is mostly done in the east season, taking into account that the sea waters are shadier compared to the west season.

This research uses tools including GPS, gill nets, scales, boats, rulers and cameras. This research uses a survey research method with data collection methods carried out using an experimental fishing approach. The data collection technique uses interview and observation methods. Observation activities in this research were carried out by directly observing lobster catching activities carried out by fishermen. According to Zulfikri (2020), observation techniques are observations made directly on something being researched.

Data obtained by observation include the number of coordinate points of the lobster fishing area, the size of the lobster caught and the type of lobster caught. Meanwhile, interviews were conducted in a structured manner with fishermen and with maritime customary stakeholders, namely the Lhok Rigaih panglima laot. Secondary data collected was water temperature data collected via Landsat 8 satellite imagery. Data analysis in this research used quantitative descriptive analysis with Arcgis 10.8 and Microsoft Excel 2013 software.

RESULT

The fishing fleet used in this research is a ship with a length of 7 meters, a width of 2 meters, a robin type engine and a gross weight of 3 GT. Meanwhile, the fishing gear used to catch lobsters is a gill net with a mesh size of 4.5 inches, 70-120 meters long and 2.5 meters wide. Lobster catching is carried out in 3 stages, including setting the net in the afternoon from 16.20 to 18.00, then immersing it for approximately 12 hours and hauling the net in the morning from 05.30 to 09.00. To make a catch, fishermen need a travel time of 45 minutes from the fishing port to the (fishing ground).

Composition of Catch

The lobsters caught include bamboo lobsters (*Panulirus longipes*), batik lobsters (*Panulirus longipes*) and sand lobsters (*Panulirus homarus*). More details about the types of lobsters caught can be seen in table 1 and figure 2.

Table 1. Catch results and fishing gear specifications

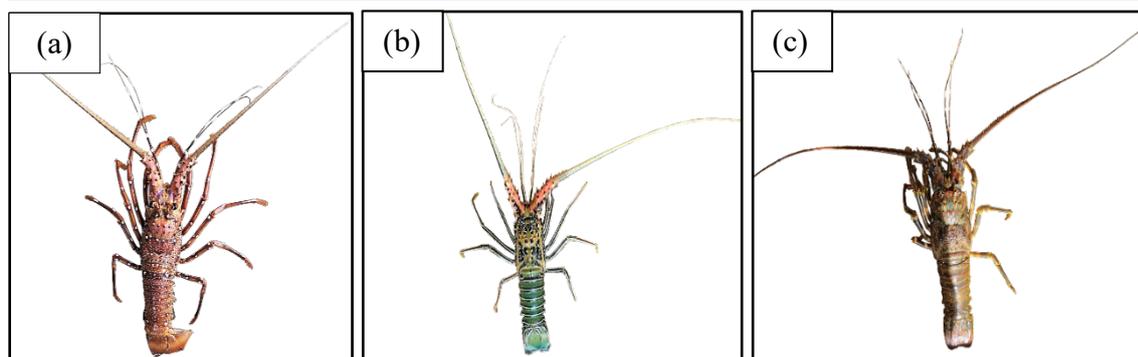| Catching Tool	Net Length (m)	Net Width (m)	Mesh Size (inchi)	Catch
Jaring insang	100	2.5	4.5	Bamboo lobster (*Panulirus versicolor*), batik lobster (*Panulirus longipes*) and sand lobster (*Panulirus homarus*)
	70	2.5	4.5	
	120	2.5	4.5	
	100	2.5	4.5	
	100	2.5	4.5	
	100	2.5	4.5	
	70	2.5	4.5	
	120	2.5	4.5	
	100	2.5	4.5	

Figure 1. The catch of lobsters caught: (a) batik lobster (*Panulirus longipes*), (b) bamboo lobster (*Panulirus longipes*), (c) sand lobster (*Panulirus homarus*)

Table 1 and Figure 1 can explain that the fishing gear used for catching lobsters is gill nets with a mesh size of 4.5", 2.5 meters wide and 70 to 120 meters long. The catches that are caught vary greatly, including bamboo lobsters. (*Panulirus versicolor*), batik lobster (*Panulirus longipes*) and sand lobster (*Panulirus homarus*).

Based on the results of the fishing test, it shows that the lobsters caught included sand lobsters (*Panulirus homarus*) with a total catch of 11 if the percentage was 50% of the total catch, while the number of bamboo lobsters (*Panulirus longipes*) caught was 10 if the percentage was 45 % of the total catch and the least batik lobster (*Panulirus longipes*) caught was 1 fish as a percentage, namely 5% of the total catch. For more details, see Figure 2.
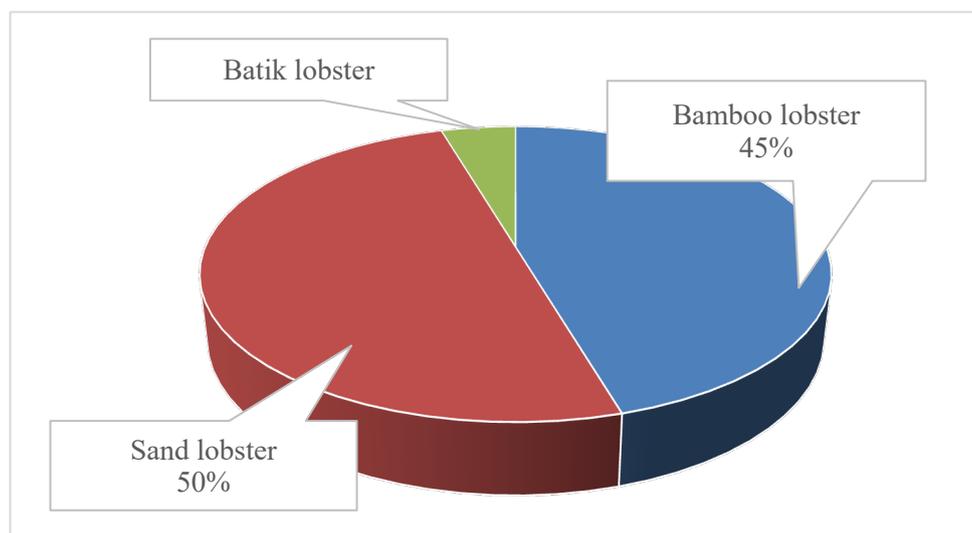

Figure 2. Percentage composition of catch

Lobster Fishing Area

The habit of lobster fishermen in Aceh Jaya is to look for areas to catch lobsters based on the criteria of areas containing coral, rocky sand and rocks. The depth of the lobster fishing area that is often carried out is 5 meters to 10 meters. This research has carried out fishing trials with gill nets in 9 (nine) lobster fishing areas (table 3).

Table 3. Lobster fishing area

Location	Coordinate		Seabed	Depth (m)
	N	E		
1	04°38'58.71"N	095°32'37.79"E	Coral sand	5
	04°39'03.53"N	095°32'37.70"E		
2	04°38'16.58"N	095°31'04.12"E	Coral	8
	04°38'22.67"N	095°31'00.15"E		
3	04°38'22.20"N	095°31'01.31"E	Coral	8
	04°38'26.30"N	095°31'07.73"E		
4	04°38'07.17"N	095°31'43.20"E	Coral	7
	04°38'06.07"N	095°31'39.30"E		
5	04°38'53.93"N	095°32'34.11"E	Coral sand	5
	04°38'52.48"N	095°32'29.91"E		
6	04°37'45.99"N	095°31'27.37"E	Coral	10
	04°37'51.07"N	095°31'21.02"E		
7	04°38'13.10"N	095°31'4.02"E	Coral	10
	04°38'08.86"N	095°31'8.12"E		
8	04°38'08.86"N	095°31'2.37"E	Coral	8
	04°38'24.07"N	095°31'0.31"E		
9	04°38'16.90"N	095°31'18.33"E	Coral	5
	04°38'12.56"N	095°31'19.05"E		

Potential lobster fishing areas in Aceh Jaya Regency are often found in areas with coral, rocks or coral sand. Lobsters use this place as a shelter from predators, a place to get food and also as a place to breed. The lobster fishing area in Aceh Jaya Regency is located on a group of small islands and the location where the fishing gear is placed is a breaking wave area so it requires skills and experience from fishermen in fishing for lobsters. If the weather conditions are bad, fishermen cannot catch lobsters. Therefore, natural factors are very important for lobster fishermen. Lobster fishing locations during the research can be seen in Figure 3.

Lobster fishing areas when viewed from oceanographic factors include water temperature at the time of data collection using Landsat 8 satellite imagery, namely in April the average temperature level in the lobster fishing area is 30 - 31 ^{0}C while in May the average temperature level in The lobster fishing area is 29 – 30 ^{0}C, this fishing area has been fished from year to year. Water quality is greatly influenced by human activities and also natural factors. More details can be seen in Figure 4.
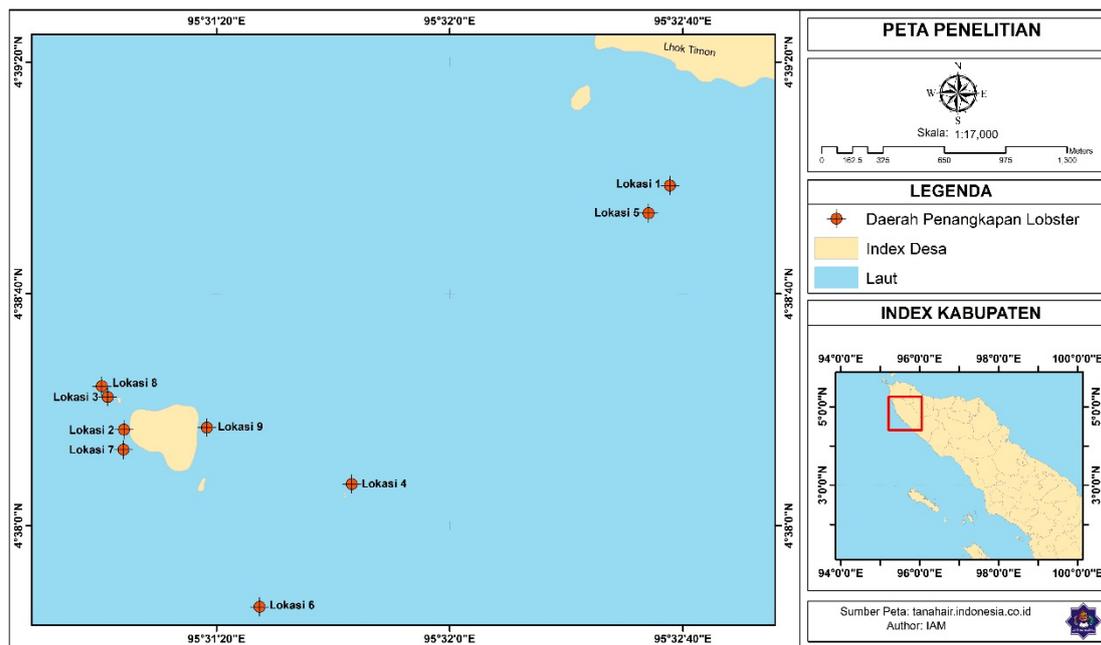
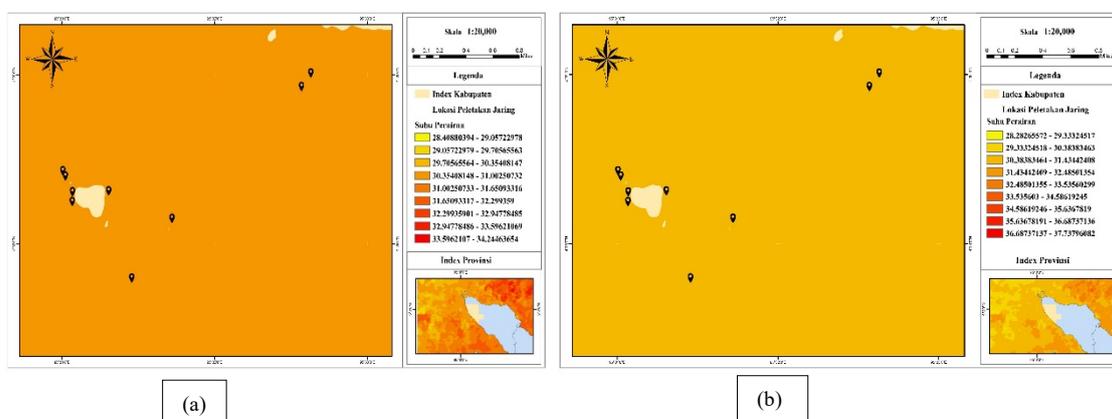Figure 3. Map of Lobster Fishing Areas

Figure 4. Water Surface Temperature: (a) April, (b) May.

DISCUSSION

Aceh Jaya Regency fishermen still use small boats in the process of catching lobsters. The fishing gear used to catch lobsters is lobster gill nets and there are also fishermen who catch lobsters by diving. According to (Wibowo *et al.,* 2020), it is explained that along the western coastal waters of the island of Sumatra there are still many fishermen who generally use small boats with a size of less than 5 PK so that their operational area is only around the coastal waters. Lobster gill nets are one of the fishing tools that are widely used by small-scale fishermen. Meanwhile, according to Puji (2017), the fishing gear that is generally used to catch lobsters is active fishing gear such as snares or by hand while diving and there are also passive fishing gear such as traps, krendet and Tramel Net (three-layer net). According to Suman *et al.,* (2019) in research that was carried out in catching lobsters using monofilament gillnets which are included in the type of bottom gill net with a 5 inch mesh and a depth of 4 meters. In general, each ship carries a net of 30 pics (1,050 meters). According to Sulistyowati & Wullandari (2022), gill net fishing gear not only catches demersal fish, but gill net fishing gear also catches shrimp, lobster and crab, with the catch system being entangled in the gill net.

Lobster fishing is carried out in 3 stages, namely lowering the net (setting) in the afternoon, immersing in the evening and pulling the net (hauling) in the morning. According to Khikmawati *et al.,* (2017) in their research, they explained that lobster fishing is usually carried out by installing fishing gear in the afternoon, after that soaking overnight and then removing the fishing gear in the morning. After the fishing gear is lifted and the catch is taken, the fishing gear is placed back in the water.

Lobsters are invertebrate animals belonging to the classis Crustacea that live in water. The lobster fishing area in Aceh Jaya Regency is at a depth of 5-10 meters. According to (Andriyani *et al.,* 2014) the results of his research stated that the majority of lobster catches were caught in fishing areas with a depth of 3-5 meters compared to depths deeper than the fishing area. According to (Wibowo *et al.,* 2020) also explained that the fishing location was at a depth of 6 – 12 meters.

According to Nurhalizah *et al.,* (2021) stated that Fishing Areas (DPI) are very important for the sustainability of capture fisheries. Fishing operations are more effective and efficient if the characteristics of the DPI can be known before carrying out fishing operations. According to Wandira *et al.,* (2020) stated that a body of water is determined by the biotic and abiotic environment, these factors can influence the abundance of lobsters, such as the depth of the water. This is because the entry of sunlight can directly affect the life of marine organisms. The intensity of sunlight will decrease quickly and disappear at a certain depth.

The basic structure of the waters of the lobster fishing area in Aceh Jaya Regency includes coral, coral sand and also rocks with the types of lobsters obtained from this area including 10 bamboo lobsters (*Panulirus longipes*), 1 batik lobster (*Panulirus longipes*) and sand lobsters. (*Panulirus homarus*) 11 individuals. The most commonly caught lobster is the sand lobster (Panulirus homarus). According to Verianta (2016), the lobster habitat really likes waters with sandy bottoms covered with seaweed. Apart from that, the lobster habitat found in coastal waters is a substrate with a composition of rocks or coral reefs with the types of lobster caught including pearl lobster (*Panulirus ornatus*), rock lobster (*Panulirus penicilatus*), sand lobster (*Panulirus homarus*) and metallic lobster (*Panulirus versicolor*). According to Irfannur *et al.,* (2018), lobsters caught and of high economic value in Aceh Jaya waters are *Panulirus homarus*, *P. longipes*, *P. ornatus*, *P. penicillatus*, *P. polyphohagus* and *P. versicolor*.

The water temperature parameter at the time of data collection was that in April the average temperature level in the lobster fishing area was 30 - 31 0C, while in May the average temperature level in the lobster fishing area was 29 - 30 0C. According to Hiwari (2018), the results of his research obtained scoring parameters for sea surface temperatures, including temperatures of 21-220C and 34-350C, which received scores that were not suitable for lobsters, 23-24 0C and 32-33 0C received conditional appropriate scores, 25-26 0C. and 30-310C scores accordingly. According to Fitriansyah *et al.,* (2020) explained that lobsters are usually found in coral reef waters or protected by rocks with a temperature range of 20-300C. According to Putra (2021), in his research it can be seen that temperatures of 27.2 0C to 30.10C are suitable for lobster life. The results of research according to Prayono *et al.,* (2022) state that when the temperature changes from cold to hot (warm), there is a significant excess of lobster seeds.

CONCLUSION

1. Lobster habitat in Aceh Jaya Regency is often found in coral, rocky or rocky sand areas. Lobster provides shelter from predators, a place to find food and a place for lobsters to breed. The dominant lobster fishing area is caught by fishermen in Aceh Jaya Regency, namely at a depth of 5 meters to 10 meters.
2. Using gill net fishing gear, the lobsters caught consisted of 3 types of lobster, including bamboo lobster (*Panulirus longipes*), batik lobster (*Panulirus longipes*) and sand lobster

(*Panulirus homarus*). The most dominant catch is sand lobster (*Panulirus homarus*) which reaches 50%.

ACKNOWLEDGEMENT

REFERENCES

Andriyani, S., Boesono, H., & Fitri, A. D. P. (2014). Pengaruh Perbedaan Warna Krendet dan Kedalaman Daerah Penangkapan Lobster (*Panulirus* Sp.) di Pantai Waru Perairan Wonogiri. *Journal of Fisheries Resources Utilization Management and Technology*, *3*(2), 72–76.

Anggraini, E., Arifin, P., & Rahman, A. (2021). Kajian Jenis Lobster (*Panulirus* sp) yang Dikirim dari Kalimantan Selatan dan Kebijakanya. *Jurnal Aquatic*, *4*(1), 1–9.

BPS Kabupaten Aceh Jaya. (2022). *Kabupaten Aceh Jaya dalam Angka 2022*. Badan Pusat Statistik Kabupaten Aceh Jaya.

DKP Kabupaten Aceh Jaya. (2020). *Data Base Kelautan dan Perikanan Kabupaten Aceh Jaya*. Dinas Kelautan dan Perikanan Kabupaten Jaya.

Fitriansyah, I., Ramli, M., & Afu, L. O. A. (2020). Studi Kelimpahan Benih Lobster (*Panulinus* spp.) Berdasarkan Karakteristik Oseanografi di Perairan Desa Ranooha Raya Kecamatan Moramo Kabupaten Konawe Selatan. *Jurnal Sapa Laut (Jurnal Ilmu Kelautan)*, *5*(4), 281–289. https://doi.org/10.33772/jsl.v5i4.15492

Hiwari, H. (2018). Estimasi Pemanfaatan Lahan Perairan Sekitar Pulau Batu Nusamanuk di Kabupaten Tasikmalaya Sebagai Daerah Budidaya Lobster (*Panulirus* spp). In *Seminar Nasional Geomatika 2017: Inovasi Teknologi Penyediaan Informasi Geospasial untuk Pembangunan Berkelanjutan* (Vol. 2). https://doi.org/10.24895/SNG.2017.2-0.396

Idami, Z. (2020). Analisis Variasi Morfologi dan Genetika Lobster (*panulirus* sp.) di Indonesia Menggunakan Mega 6. In *[Skripsi]*. Universitas Islam Negeri Sumatera Utara.

Irfannur, W. R. I., & Riyanto, M. (2018). Komposisi Hasil Tangkapan dan Ukuran Lobster dengan Jaring Insang di Perairan Kabupaten Aceh Jaya. *Albacore Jurnal Penelitian Perikanan Laut*, *1*(2), 211–223. https://doi.org/10.29244/core.1.2.211-223

Kembaren, D. D., & Nurdin, E. (2015). Distribusi Ukuran dan Parameter Populasi Lobster Pasir (*Panulirus homarus*) di Perairan Aceh Barat. *Jurnal Bawal*, *7*(3), 121–128. https://doi.org/10.15578/bawal.7.3.2015.121-128

Kementerian Kelautan dan Perikanan. (2020). Peraturan Menteri Kelautan dan Perikanan Nomor 12/PERMEN-KP/2020 tentang Pengelolaan Lobster (*Panulirus* spp.), Kepiting (*Scylla* spp.), dan Rajungan (*Portunus* spp.) di Wilayah Negara Republik Indonesia. In *Database Peraturan BPK*.

Kementerian Kelautan dan Perikanan. (2022). Peraturan Menteri Kelautan dan Perikanan Republik Indonesia No 19 Tahun 2022 tentang Statuta Politeknik Kelautan dan Perikanan Jembrana. In *Database Peraturan BPK*.

Khikmawati, L. T., Martasuganda, S., & Sondita, F. A. (2017). Hang-in Ratio Gillnet Dasar dan Pengaruhnya Terhadap Karakteristik Hasil Tangkapan Lobster (*Panulirus* spp.) di Palabuhanratu Jawa Barat. *Jurnal Marine Fisheries*, *8*(2), 175–186.

Nurhalizah, S., Musbir, N. J. I., Nompo, B. D., & Hajar, M. A. I. (2021). Karakteristik Daerah Penangkapan Ikan pada Operasi Rawai Dasar di Perairan Bulukumba Sulawesi Selatan.

Prosiding Simposium Nasional VIII Kelautan dan Perikanan, Makasar 05 Juni 2021, hlm. 305–312.

Prayono, Jefri, E., Astriana, B. H., Rahman, I., Larasati, C. E., & Sukorahajo, S. . (2022). Kelimpahan Bibit Lobster di Teluk Bumbang Kabupaten Lombok Tengah. *Jurnal Kelautan Nasional*, *17*(2), 83–92.

Puji, F. Y. (2017). *Strategi Pengelolaan Penangkapan Lobster (Panulirus spp) Secara Berkelanjutan di Kabupaten Simeulue Aceh*. Universitas Terbuka.

Putra, R. R. (2021). Studi Parameter Pendukung Lingkungan Terhadap Pembesaran Lobster (*Panulirus* Spp .) Metode Keramba Dasar. In *[skripsi]*. Universitas Islam Negeri Sunan Ampel.

Sulistyowati, B. I., & Wullandari, U. (2022). Komposisi Hasil Tangkapan Kapal Gillnet di Pangkalan Pendaratan Ikan Karangsong Kabupaten Indramayu (studi kasus: KM Andora B). *Jurnal Ilmu Dan Teknologi Perikanan Tangkap*, *4*(1), 115–122.

Suman, A., Hasanah, A., Pane, A. R. P., & Panggabean, A. S. (2019). Penangkapan, Parameter Populasi Serta Tingkat Pemanfaatan Lobster Pasir (*Panulirus homarus*) dan Lobster Batu (*Panulirus penicillatus*) di Perairan Gunung Kidul dan sekitarnya. *Jurnal Penelitian Perikanan Indonesia*, *25*(3), 147–160. https://doi.org/10.15578/jppi.25.3.2019.147-160

Verianta, M. (2016). Jenis Lobster di Pantai Baron Gunungkidul, Yogyakarta. In *Tesis, Program Studi Biologi Fakultas Teknobiologi*. Universitas Atma Jaya Yogyakarta.

Wandira, A., Ramli, M., & Halili. (2020). Jenis dan Kelimpahan Benih Lobster (*Panulirus* spp.) Berdasarkan Kedalaman di Perairan Desa Ranooha Raya, Kecamatan Moramo, Kabupaten Konawe Selatan. *Jurnal Sapa Laut*, *5*(2), 163–172. http://ojs.uho.ac.id/index.php/jsl

Wibowo, S., Arifin, S., & Riyanto, A. (2020). Pengoperasian Alat Penangkap Lobster. *Buletin Teknik Litkayasa*, *18*(2), 5.

Wahyu, W. F. (2015). Perikanan Lobster Laut: Panduan Penangkapan dan Penanganan. In *WWF-Indonesia* (1 ed., hal. 3).

Zulfikri. (2020). *Keragaan Alat Tangkap Pancing Ulur dan Jaring Insnag Hanyut pada Rumpon Ijuk di Perairan Calang Kabupaten Aceh Jaya* [skripsi]. Aceh : Jurusan Perikanan Fakultas Perikanan dan Ilmu Kelautan Universitas Teuku Umar.