SIZE DISTRIBUTION AND FISHING SEASON OF BLUE SWIMMING CRAB (PORTUNUS PELAGICUS) IN TUKAK SADAI WATERS, SOUTH BANGKA REGENCY, INDONESIA

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Abstract: Blue swimming crab (Portunus pelagicus) resource is a fish export commodity located in Indonesia with high economic value. Therefore, accurate information is needed when catching fishes to obtain the appropriate size for sustainable use. It is also important to assess information on P. pelagicus distribution and its fishing season for sustainable management of resources. Therefore, this study aims to analyse the distribution size and fishing season for P. pelagicus in the waters of Tukak Sadai, South Bangka Regency, in Indonesia. The research was carried out from March to May 2019, with data collected through the survey method. The size distribution of the fish was analyzed using the frequency distribution analysis approach, while the fishing season was determined with a time series analysis technique towards the catch (kg) per trip. The results showed that fishing ground A of the male fish was distributed in the size of 70.80-155.00 mm and the female was 73.29-146.00 mm, while the fishing ground B size for male was 94.25-162.00 mm and female was 93.86-155.00 mm. Furthermore, the percentage of P. pelagicus size is above 100 mm, fishing ground B was more dominant than A, with percentages of 93% and 69%. Immature female P. pelagicus gonads of fishing ground A and B were found in size classes of 100-110 mm and 111-121 mm, while the mature ones were found at the same size of 122-132 mm. In addition, the carapace width of those laying eggs in fishing ground B is greater than in fishing ground A, while the peak season for catching the fish in Tukak Sadai waters is the West (January-February) and the East Seasons (April-July) with the peak in June. The average P. pelagicus catch in fishing ground A at west and east seasons are 6.57 kg / trip and 6.73 kg / trip, while in fishing ground B it is 64.49 kg / trip and 57.59 kg / trip, respectively

Keywords: Size distribution; fishing season; P. pelagicus; Tukak Sadai;

I. INTRODUCTION

Blue swimming crab (Portunus pelagicus) is a valuable traded commodity in Indonesia. According to data obtained from the Central Bureau of Statistics in 2018, an increase of 0.67% and 6.05% was detected in its market price and export volume from 2012 to 2017 and the major countries of export destination include United States, China and Japan [1].
The penetration of *P. pelagicus* into the domestic and international markets leads to an increase in its prices [2]. Furthermore, the high demand in both markets resulted in the excessive exploitation of *P. pelagicus* natural resources. Based on data obtained from the Central Bureau of Statistics in 2018, the export needs of this species are dominated by 65% of capture fisheries [1]. It is commonly found in South Bangka Regency particularly in Tukak Sadai Village, and the main source of livelihood is fishing. The commonly utilized fishing gear is fold trap and longline system operation. The Tukak Sadai water is among the Fisheries Management Area, with the prospective *P. pelagicus* in WPP 711 and Number of Catches Allowed (JTB) are 9,437 and 7,550 tons respectively [3]. The level of this resource fully exploited in WPP is 0.63, and monitoring the catch size is needed to maintain sustainability. The determination of the fishing area is carried out traditionally based on the fishermen’s experiences and uncertainty of catches, due to the various carapace widths ranging from 49.8 to 98.8 mm for the juveniles, while for the adults it ranges from 98.9 to 129.8 mm. Older *P. pelagicus* has carapace width within 129.9 and 169.8 mm [4,5].

Based on this research, the size distribution of this resource varies between the sexes and water locations [6,7,5]. In addition, this information plays a vital role in *P. pelagicus* management [8]. The government’s efforts towards the sustainability of this resource is the authorization of the Minister of Marine Affairs and Fisheries Regulation number 12 of 2020 to ensure that size of catches need to be >10 cm and the females need not be in the state of laying eggs [9]. Fishermen are unable to limit the width of the *P. pelagicus* carapace caught. Furthermore, they presume that there is an abundance of resources therefore fishing activities is carried out throughout the year. The key to successful management is the ability to understand the area and season [10]. Therefore, this study aims to analyse the size distribution and fishing season of *P. pelagicus* in Tukak Sadai waters, South Bangka Regency.

II. METHODOLOGY

**Data collection**

This research was carried out in Tukak Sadai Waters, South Bangka Regency, Bangka Belitung Province in Indonesia from March to May 2019. There are 12 fishing points scattered in the waters, 6 of them are located at a distance of approximately 3.69-11.7 km while the remaining 6 are located at relatively 25.74 to 40.67 km from the fishing base as shown in Figure 1.

![Fig.1: Maps of fishing ground in Tukak Sadai Waters, Bangka Belitung, Indonesia](image)

Samples of *P. pelagicus* were collected at the 12 fishing stations. Biological parameters such as carapace width (cm), weight (gr), sex and maturity level of female gonads was measured at each station. Prior to the carapace width, a vernier caliper was used to measure the distance between its 9 anterolateral spines, and the least size which is 0.01 mm was recorded. Digital scales was used to measure weight and the smallest size obtained was 0.1 gram [11,12,13]. The gonad maturity stage of female *P. pelagicus* was determined by dividing into five stages [14,15,16]. A total of 15 females were randomly observed at each fishing station and data was collected based on daily production from 2013 to 2019 by 11 collectors in the village.
Data analysis

Fishing grounds

Data analysis was carried out based on the distribution of the carapace width. In addition, frequency distribution was used to determine the distributive size classes of the captured P. Pelagicus which was discovered to possess a width of 10 mm and this classification is based on the fishing ground and gonad maturity level [17]. It also relates to the catches, which is 10 cm as proposed by the Ministerial Decree No. 12 of 2020 [9].

Pattern of Catching Season

The pattern of catching P. pelagicus or its season was calculated using time series analysis. Its season was predicated by analyzing the catch data from the fishing effort association (CPUE) for the last 7 years, (2013 - 2019). The moving average method was used to evaluate the fishing season patterns and the procedure is stated as follows [18,19,17]:

(1) Calculating the CPUE time series data from 2013 to 2019:
\[ CPUE_i = \frac{1}{n} \left[ \prod_{i=1}^{n} CPUE_i \right] \]

Description:
- \( n \): CPUE-i; and
- \( i \): 1,2,3, ..., 84

(2) Compiling the moving average of 12 months CPUE (RG):
\[ RGP_i = \frac{1}{12} \left[ \prod_{i=1}^{12} CPUE_i \right] \]

Description:
- \( RG_i \): 12-month moving average-i;
- \( CPUE_i \): CPU-i; and
- \( i \): 4,5,6, ..., n-1

(3) Compiling the centralized CPUE moving average (RGP):
\[ RGP_i = \frac{1}{12} \left[ \prod_{i=1}^{12} CPUE_i \right] \]

Description:
- \( RG_i \): 12-month moving average-i; and
- \( i \): 4,5,6, ..., n-1

(4) Calculating the average ratio for each month (Rb):
\[ Rb_i = \frac{RGP_i}{CPUE_i} \]

Description:
- \( Rb_i \): Monthly average ratio-i;
- \( CPUE_i \): CPU-i;
- \( RGP_i \): Centralized CPUE moving average-i; and
- \( i \): 4,5,6, ..., n-1

(5) Compiling the average value of matrix sizes i x j for each month starting from June to July. The next step is calculating the total average ratio as well as the pattern of fishing season.
   (i) Average ratio for month-i (RBB):
\[ RBB_i = \frac{1}{n} \left[ \prod_{i=1}^{n} Rb_i \right] \]

Description:
- \( RBB_i \): Average of Rb_i for month-i;
- \( Rb_i \): Monthly average ratio for the matrix sizes i x j;
- \( i \): 1,2, ..., 12; and
- \( j \): 1,2,3, ..., n

   (ii) Total monthly average ratio (RBB):
\[ RBB = \sum_{i=1}^{12} RBB_i \]

Description:
- \( RBB \): Total monthly average ratio;
- \( RBB_i \): Average of Rb_i for month-i; and
- \( i \): 1,2,3, ..., 12
(iii) Fishing Season Index

Ideally, the total monthly average ratio (JRBB) is 1200. However, this tends to be affected by numerous factors, therefore it needs to be rectified with the Correction Factor (FK) value, which is stated as follows:

\[
FK = \frac{1200}{JRBB}
\]

Description:
- FK: Correction Factor value;
- JRBB: Total monthly average ratio

Fishing Season Index (IMP) is calculated with the following formula:

\[
IMP_i = RRB_i \times FK
\]

Description:
- IMP\_i: Fishing season index month \(i\);
- RRB\_i: Average of \(Rb_j\) for month \(i\);
- FK: Correction Factor value;
- \(i\): 1, 2, 3, ..., 12

### III. RESULT

**Catching Area and Technical**

It was discovered that 11 collectors from Tukak Sadai Village bought fresh P. pelagicus. On the average, a collector encompasses 7-10 fishermen. The fishing area is divided into 2, namely fishing ground A and fishing ground B and the numbers of fishermen are 68 and 26 respectively as shown in Figure 1. The most commonly utilized fishing gear is a fold trap with the following dimensions, length 48 cm, width 30 cm, and height 17 cm. It consists of a steel material with a diameter of 0.4 cm and polyethylene multifilament nets with a mesh size of 2.7 cm. A funnel with a width of 25 cm is attached at both sides. The middle part has a curved fastener that functions as a bait hook as shown in Figure 2.

**Fig.2: Dimensions of folding traps**

At fishing ground A, fishing activities are usually carried out in boats, with the following dimensions, length of 7 meters, width of 1.5 meters and a height of 1 meter.

**Fig.3: Operation of folding traps**
The fold trap is operated by applying the longline system in addition the main rope used has a length of 3000 m and a diameter of 0.7 cm, while the branch rope has a length of 1.5 m and a diameter of 0.4 cm, the distance between the traps is 10 m (Figure 3). However, the closest distance from the beach is 1.12 km and the farthest is 5.92 km, with an average of 2.90 km. The fishing activity starts at 05.00 and the boat speed is between 5-7 knots, the travel time ranges from 20 to 50 minutes covering a distance of approximately 3.69 to 11.7 km from the fishing base. Immediately, the fishermen arrives at the station, the fold trap is lifted, while checking for the presence of P. pelagicus, which is removed assuming any is found. Furthermore, the traps were restocked with pepetek fish (Leiognathidae) and are neatly arranged on the boat after all the fishing gear had been checked [20].

Hauling activities of the fold traps are carried out manually with the boat moving at a speed of 1 to 2 knots. The duration ranges from 1 hour 30 minutes to 2 hours 30 minutes. After all the traps have been checked, the fishermen search for new fishing grounds with the boat moving at a speed of 3-4 knots until all the traps are released on the seabed for relatively 19 to 21 hours. In fishing ground B, 2 fishermen usually engage in a fishing trip. One person is the captain while the other acts as the crew. The dimensions of the boat used consist of a length of 12 m, width of 2.10 m and height of 1.4 m. The distance from the fishing ground to the base ranges from 25.74 km to 40.67 km and the travel time is 3 hours. The distance to the nearest beach is 6.43 km with an average of 7.98 km. The fishermen start the activity by lowering the trap into the water and leaving it for a period of 30 to 60 minutes. It is further left on the seabed for 5 to 7 hours before hauling, and this lasts from 1 hour 30 minutes to 2 hours, in addition a tool similar to a line hauler is located in front of the boat.

**The catch in fishing ground A**

The catch obtained from 6 sampling points contained in fishing ground A has a distributive class sizes of P. pelagicus carapace width (CW) between 67 and 165 mm. 242 species, which consist of 132 males and 110 females were captured. It was dominated by the class size 100 to 110 with 30 and 25 catches respectively as shown in Figure 4.

![Fig. 4: The catch at fishing ground A](image)

According to Minister of Marine Affairs and Fisheries Regulation number 12 of 2020, the legal size of P. pelagicus is 10 cm, therefore 166 (69%) is legal while 76 (31%) is illegal as shown in Figure 5.

![Fig. 5: Legal size catch composition at fishing ground A](image)
The catch in fishing ground B
The catch made by fishermen at 6 research sampling points contained in fishing ground B amounted to 481 fish which consist of 227 males and 254 females. It was dominated by carapace width class 111-121 mm with 64 and 76 catches, respectively as shown in Figure 6.

![Fig.6: The catch at fishing ground B](image)

The composition of *P. pelagicus* in fishing ground B encompasses of legal (93% or 448 fishes) and illegal sizes (7% or 33 fishes) as shown in Figure 7.

Distribution of Female Gonad Maturity Stages (GMS)
81 female samples of *P. pelagicus* obtained from fishing ground A, gonad maturity stages were observed. The results from the analysis showed that 35% or 28 females were dominated by stage II and III. On the contrary 90 female samples obtained from fishing ground B, gonad maturity stage were studied, and 32 of them or 36% were dominated by stage 3 as shown in Table 1.

| Size Class | The Frequency of GMS Fishing Ground A (individual) | Total (individual) | The Frequency of GMS Fishing Ground B (individual) | Total (individual) |
|------------|--------------------------------------------------|--------------------|--------------------------------------------------|--------------------|
| 67-77      | I 1  II 2  III 1  IV 0  V 0                     | 3                  | I 0  II 0  III 0  IV 0  V 0                     | 0                  |
| 78-88      | I 2  II 1  III 1  IV 0  V 0                     | 4                  | I 0  II 0  III 0  IV 0  V 0                     | 0                  |
| 89-99      | I 1  II 4  III 3  IV 1  V 1                     | 8                  | I 1  II 1  III 1  IV 1  V 1                     | 3                  |
| 100-110    | I 3  II 6  III 5  IV 2  V 1                     | 16                 | I 3  II 5  III 4  IV 1  V 1                     | 13                 |
The Frequency of GMS Fishing Ground A (individual)  | Total (individual)  | The Frequency of GMS Fishing Ground B (individual)  | Total (individual)  
| I  | II | III | IV | V | I  | II | III | IV | V | I  | II | III | IV | V |
| 111-121 | 8 | 3 | 2 | 2 | 15 | 3 | 14 | 5 | 1 | 4 | 27 |
| 122-132 | 5 | 10 | 4 | 19 | 3 | 7 | 15 | 5 | 27 |
| 133-143 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 4 | 2 | 12 |
| 144-154 | 1 | 2 | 3 | 3 | 2 | 1 | 3 | 6 |
| 155-165 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 |
| Total | 7 | 28 | 28 | 13 | 5 | 81 | 1 | 29 | 32 | 1 | 2 | 7 | 90 |

**Distributive Class Size of P. pelagicus Catching Season Pattern in Tukak Sadai Waters**

The results from the analysis of P. pelagicus fishing season index (IMP) in accordance with data collection relating to production activities for 7 years (2013-2019) ranges from 84.81 to 114.59. The highest IMP value occurred in the east season, namely April - July while the highest PMI started during the west season, namely January, and February as shown in Table 2.

**Table 2: Monthly average (RRBi) and fishing season index (IMP) of small crabs**

| Season | Month | RRBi | IMPi |
|--------|-------|------|------|
| West   | October | 0.86 | 84.81 |
|        | November | 0.92 | 89.94 |
|        | December | 0.98 | 96.56 |
|        | January | 1.06 | 104.05 |
|        | February | 1.12 | 109.87 |
|        | March | 1.01 | 99.62 |
|        | April | 1.05 | 103.51 |
|        | May | 1.15 | 112.82 |
|        | June | 1.17 | 114.59 |
|        | July | 1.06 | 103.86 |
|        | August | 0.94 | 92.34 |
|        | September | 0.90 | 88.03 |
|        | JRRBi | 12.23 |
|        | FK | 98.15 |

Description:
- RRBi: average per month
- IMP: Fishing season index
- FK: Correction factor

**Table 3: Classification of fishing season based on IMP**

| No | IMP Value | Season Category |
|----|-----------|----------------|
| 1  | <50%      | Famine         |
| 2  | 50%IM<100%| Moderate       |
| 3  | >100%     | Peak           |

Fishing season category [21].

According to table 3, the peak of west season for P. pelagicus fishing in Tukak Sadai waters is January, and February while for the east season, it is April, May, June, and July. However, the moderate season starts from August to December and March. Based on the data obtained from small crab collectors, there are differences in the number of catches per trip. At fishing ground A, the average catch per trip ranges from 5.95-7.36 kg/trip. Although, the highest catch was in March and July with values of 7.24 and 7.36 kg/trip, respectively. The lowest was in October and November with values 6.12 and 5.95 kg/trip, respectively (Figure 9). At fishing ground B the average catch per trip ranges from 50.16 to 69.87 kg/trip. The highest was in February and March with values of 67.53 kg/trip and 69.87 kg/trip respectively while the lowest catch was in July, and August with values of 50.16 and 51.61 kg/trip, respectively as shown in Figure 8.
IV. DISCUSSION

The main fishing tool utilized by fishermen in Tukak Sadai waters is the fold traps. On the average, approximately 250 to 300 traps per trip were used during operations in fishing ground A. Conversely, 500 traps per trip were used in fishing ground B. The number of trap settings per fishing trip in fishing ground A and fishing ground B is 1 and 5 respectively.

The operation of fold traps carried out in the Tukak Sadai waters is similar to the technique carried out in Pati District waters where in a day there are relatively 1 or 2 as well as 5 to 6 settings in the coastal and offshore zones, respectively [4]. Spatially, there are differences in P. pelagicus catches at fishing ground A and fishing ground B. The wide spread of male and female P. pelagicus carapace in fishing ground A ranges between 70.80 to 155.00 mm and from 73.29 to 146.00 mm, respectively. The dominant male and female P. pelagicus caught in fishing ground A were in the class size of 100-110 mm, while in fishing ground B, the carapace width ranged from 94.25-162.00 mm for the males and 93.86-155.00 mm for the females. The dominant P. pelagicus caught in fishing ground B is in the class size of 111-121 mm.

Although, when compared with the catches in Pati waters, Central Java, the carapace width in Tukak Sadai waters is larger, particularly in the coastal zone, the width carapace ranges from 60 to 128 mm for the males and from 60 to 138 mm for the females. Furthermore, in the offshore zone, it ranges from 92 to 158 mm for the males and from 98 to 168 mm for the females [4]. In general, the size of P. pelagicus caught in Tukak Sadai was greater than those caught in Lasongko Bay, which ranges from 89.00 to 124.48 mm for the males and from 89.80 to 139.80 mm for the females [22], however this is smaller than those caught in the coastal waters of Bandar Abbas, North Persian Gulf which was from 23 to 173 mm [23]. According to the research carried out in East Lampung waters, the width of P. pelagicus carapace caught was greater than those in Tukak Sadai waters, which ranges from 71.27 to 181.17 mm for males and 74.12 to 173.21 mm for females. [8]. The difference in the size of P. pelagicus caught at fishing ground A and fishing ground B is due to distance between the fold traps and the shore. In fishing ground A, the average distance from the beach to areas where the traps are set is 2.90 km, while in fishing ground B it is 7.98 km.
The width of *P. pelagicus* carapace in the waters of Pangkajene Districts and Archipelago is 110 mm and they are caught at a minimum distance of 3.7 nautical miles from the coast to the offshore [24]. There are 68 fishermen in fishing ground A, and 26 of them in fishing ground B. Intensive fishing activity also affects the distributive sizes of small crabs, this is due to the excessive pressure. Therefore, the higher the average catching intensity, the smaller the carapace width size with a decline in its abundance [4]. The male catches (55%) *P. pelagicus* in fishing ground A dominates the females (45%), while in fishing ground B, 53% of females and 47% of males were caught. The males dominated the beach while most of the females were caught offshore [24]. This is because *P. pelagicus* males tend to easily adapt to waters with low salinity therefore it is excessively distributed in relatively shallow coastal waters. On the contrary, the females adapt to high saline environment, particularly for spawning thereby spreading rapidly in deeper waters. Conclusively, adult females prefer habitats with higher salinity and deeper waters [25]. The research results in the coastal waters of Serawak, Malaysia stated that the female *P. pelagicus* migrates towards deeper and shallower offshore areas near the coast, while the male migrates towards deeper offshore compared to nearshore areas. The average distance migrated by both male and female *P. pelagicus* for 30 days were 7.36 km ± 1.78 and 9.15 km ± 1.87, respectively [26].

The carapace width of *P. pelagicus* authorized by the Minister of Marine Affairs and Fisheries Regulation No. 12 of 2020 is >100 mm and it is prohibited to catch females that lay eggs [9]. Based on the size that needs to be caught, 69% of *P. pelagicus* obtained from fishing ground A is ideal while 31% is inappropriate. On the contrary, 93% of the catches from fishing ground B is ideal. The purpose of catching *P. pelagicus* above 100 mm is for the sustainability of the small crab resources. The size of the smallest carapace width caught in the waters have to exceed the size of the first sexually matured ones (Lm50%), therefore spawning is important for additional stock in the wild. [27]. The distribution of carapace width sizes with GMS I-V at fishing ground A ranges from 67-154 mm, while in fishing ground B it is from 89 to 165 mm. 35% of GMS at fishing ground A and fishing ground B were dominated by 36% of GMS III and 32% of GMS II with. The carapace width size of immature female *P. pelagicus* gonads (GMS I and II) in fishing ground A were spread class sizes ranging from 67 to 143 mm size class, while in fishing ground B, the class size is from 89 to 143 mm. At fishing ground A, the dominant class size is from 100 to 110 mm while at fishing ground B it is from 111 to 121 mm. In this research, the carapace width of immature female gonads was smaller than those caught in Lasongko Bay, Central Buton, Southeast Sulawesi, the class sizes were ranging from 69.9 to 159.8 mm. The carapace width of female *P. pelagicus* caught in fishing ground B was similar to those caught in Lasongko Bay, with class sizes ranging from 109.9 to 119.8 mm [5].

The matured females (GMS III and IV) caught at fishing ground A are in class sizes ranging from 67 to 154 mm, while those obtained at fishing ground B are within 89 to 165 mm with varying frequencies. The carapace width of *P. pelagicus* gonads in Tukak Sadai waters is different from those found in Lasongko Bay, and the size of the mature female *P. pelagicus* gonads was discovered to be within 79.9 to 159.8 mm [5].

The highest frequency was discovered in the class sizes ranging from 122 to 132 mm, at fishing ground A 14 and fishing ground B 20.P. pelagicus ovigerous females at fishing ground A were in the class sizes of approximately 111 to 121 mm and 133 to 143 mm, while at fishing ground B they are within the range of 111 to 121 and from 144 to 154 mm. It shows that the large species tend to migrate towards the offshore waters. The lay eggs in highly saline waters [28]. Adult female that lay eggs migrates towards sea water with high salinity of >30 ppt and depth of >10 m [29]. This phenomenon causes a decrease in the number with large carapace width while those small in size are unaffected. The results from a study carried out on the west coast of Australia stated that female *P. pelagicus* migrate from estuarine waters to the offshore just before their gonads are fully developed, whereas the immature and small species remain in estuarine waters [30].

Based on the value of fishing season index (IMP), the fishing season for *P. pelagicus* in the waters of Tukak Sadai, South Bangka Regency is in the West (January–February) and East Seasons (April–July) with its peak in June. The peak season is similar to Pangkajene Islands and Pangkep Regency waters and it usually occurs in the dry season (June) during the new month (dark month) [31,17]. Meanwhile, moderate fishing occurs during the western (October to December, as well as March) and eastern seasons (August and September). Furthermore, a similar study carried out in San Miguel Bay, Philippines during the year reported that the peak season is from June to September while the dry season is from October to December [32]. The average catch by fishermen operating at fishing ground A in the west and east seasons is 6.57 kg/trip and 6.73 kg / trip respectively. The highest average catches that occurred during the western and eastern seasons, in the month of February (7.24 kg / trip) and June (7.36 kg / trip) respectively. The lowest catch in the west season occurred in October (5.95 kg / trip). However, in the east season, it occurred in September (6.12 kg / trip). The average catch of fishermen operating in fishing ground A in the west and east seasons is quite large when compared to Lasongko Bay, Southeast Sulawesi, Indonesia, which ranges from 0.7-1.9 kg / trip and there is tendency of a decline [33].
The average catch value in fishing ground B is different from fishing ground A. This is due to differences in fishing grounds, distance from the coast, the number of fold traps used as well as the fishing gear settings. The average fishermen’s catch in the west and east seasons is 64.49 and 57.59 kg/trip, respectively. The highest catch in the west and east seasons was in March (69.86 kg/trip) and May (67.44 kg/trip). The lowest average in a certain year occurred during the east season, in the month of July and August with 50.16 and 51.61 kg/trip, respectively. In San Miguel Bay, Philippines, the initial average catch of P. pelagicus was within 11 to 30 kg/day and only 1-10 kg/day at a particular period [32]. It shows that intensive fishing activities and pressure on resources causes a decline in the volume of catches.

V. CONCLUSION

Based on the research results, it is concluded that the distributive size of P. pelagicus caught in fishing ground A ranges from 70.80 to 155.00 mm for males and from 73.29 to 146.00 mm for females, the dominant size caught is within 100 to 110 mm. In fishing ground B the distributed sizes for male ranges from 94.25 to 162.00 mm while for the females it is from 93.86 to 155.00 mm, the prevalent size caught is within 111 to 121 mm. The percentage size for P. pelagicus is > 100 mm subsequently fishing ground B was more dominant than fishing ground A, with 93% and 69%, respectively. GMS of P. pelagicus in fishing ground A and B were dominated by GMS III and II with a percentage of 35% in fishing ground A and 36% and 32% in fishing ground B. Females with immature gonads on fishing ground A and B are in the class sizes of 100-110 mm and 111-121 mm, respectively. Meanwhile, those with mature gonads were in the same class size of 122-132 mm. The carapace width of P. pelagicus laying eggs at fishing ground B is greater than those at fishing ground A. The fishing season pattern for P. pelagicus in Tukak Sadai waters is in the West (January-February) and East Seasons (April-July) with the peak season in June. The average catch in the west and east seasons is 6.57 and 6.73 kg/trip in fishing ground A as well as 64.49 and 57.59 kg/trip in fishing ground B, respectively.

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