



**The 2<sup>nd</sup> Regional Scientific and Technical Committee Meeting for the SEAFDEC/UN Environment/GEF Project on Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand**

21<sup>st</sup> – 23<sup>rd</sup> May 2019

Thansur Sokha Hotel, Kampot Province (Fisheries Refugia Site), Cambodia

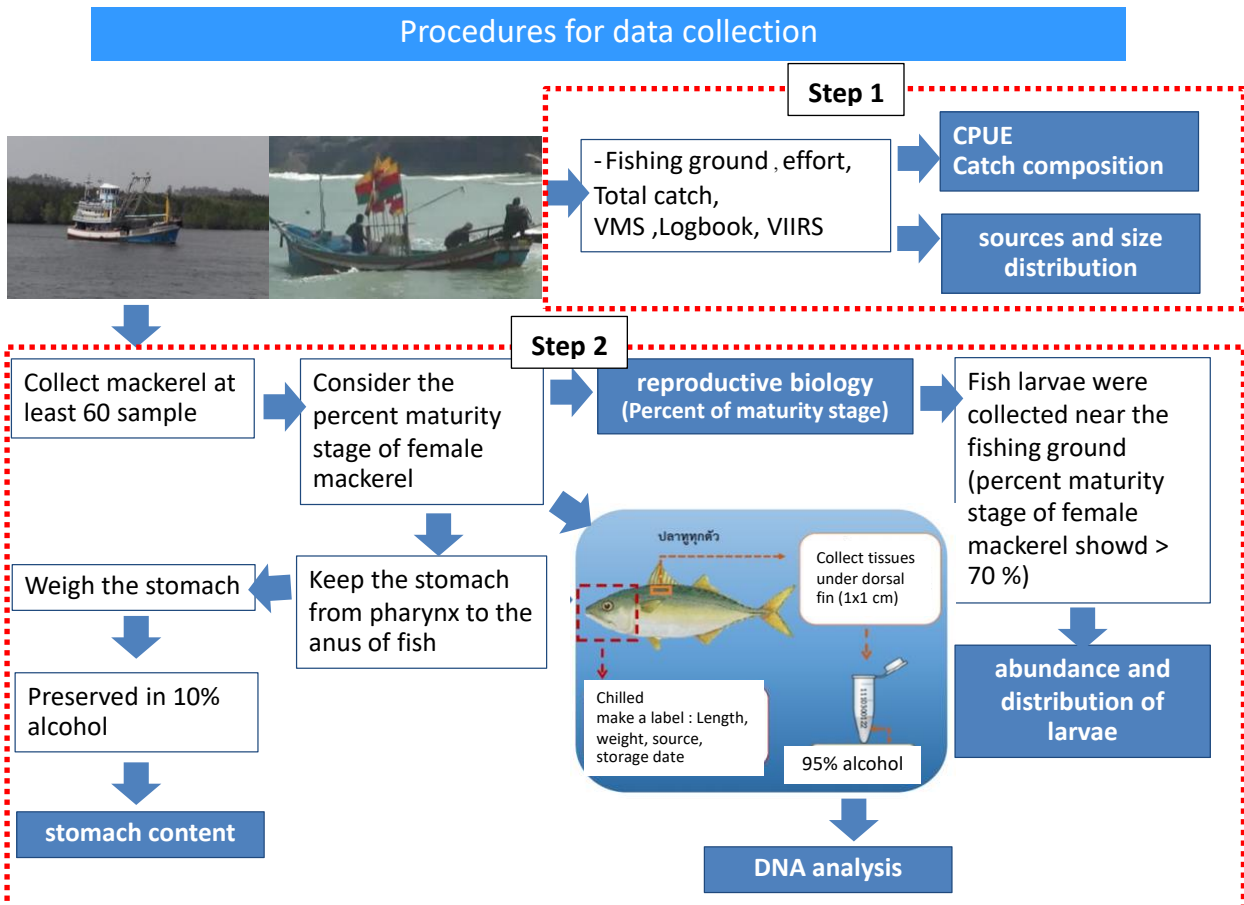
**BIOLOGICAL STUDY OF INDO-PACIFIC MACKEREL IN TRAT PROVINCE, THAILAND**

Biological study of Indo-Pacific mackerel in Trat Province of Thailand is a part of the project entitled “Monitoring of the Life Cycle of Indo-Pacific Mackerel in the Gulf of Thailand” under the research centers of the Department of Fisheries of Thailand. The project includes 5 research topics, namely:

1. Study on sources and size distribution of Indo-Pacific mackerel in Gulf of Thailand;
2. Study on reproductive biology of Indo-Pacific mackerel in Gulf of Thailand;
3. Study on abundance and distribution of Indo-Pacific mackerel in Gulf of Thailand;
4. Study on stomach content of Indo-Pacific mackerel in Gulf of Thailand; and
5. Study on the genetic characteristics of the population of Indo-Pacific mackerel in Gulf of Thailand

**Procedures for data collection (Figure 1)**

1. Interview master fishermen or crewmembers of the Indo-Pacific mackerel fishing boats regarding fishing ground and fishing efforts, such as, how many days for one fishing trip? How many times for fishing operation and total catch per trip? As well as sampling aquatic animal. Based on the results of interview and fish sampling, analyzing capture rate (catch per unit effort), species composition, fishing grounds, and distribution of indo-pacific mackerel by sizes in different fishing grounds information, as well as the information obtained from the VMS installed in the 30 Gross Ton fishing boats or over.



**Figure 1** The procedures for data collection

2. Collect the mackerel at least 30 samples from each boats for identification of maturity stage, if the results of analysis show that over 70% of the fish samples are maturity stage, within one week, the research team then go to the area where the mackerel were caught, using a plankton net with the mesh size of 330 micron collecting the larvae for identification of species composition. In addition, study of stomach content to examine the mackerel's diet and assess its feeding habits and the tissue at the base of dorsal fin are collected and preserved in 95% alcohol for DNA analysis, while the head of fish samples are chilled for otolith analysis

**Examine of results to know period of spawning season and spawning grounds**

The main objective of biological study on Indo-Pacific Mackerel is to examine period of spawning season of mackerel in Trat Province based on 3 studies results, including

1. Study on size distribution of indo-pacific mackerel
2. Percentage maturity stage of female
3. Abundance distribution of Mackerel's juveniles

The results showed that the mackerel with the size of greater than 17 cm were found at the spawning grounds during spawning season. More than 60% of them were at the maturity stage, after that, the Mackerel's larvae were appeared

**Spawning season and spawning grounds**

Focus on Trat Province that results on size distribution of indo-pacific mackerel, percentage maturity stage of female and abundance distribution of Mackerel's juveniles will be displayed as a symbol in the map. Show results monthly (Figure 2-13)

Consideration of information on size distribution of indo-pacific mackerel, percentage maturity stage of female and abundance distribution of Mackerel's juveniles in the year. The result showed that spawning season was found all year, while the peak showed in January-April. The spawning grounds were in the areas near Koh Kood and Koh Chang, Trat Province. (Figure 14)

Shows 3 important information as follows:

1. Information on distribution of mackerel, represented by blue fish. It can be divided into 4 sizes, over 17 cm long, which are indicated as the breeders, juvenile fish are range between 14-17 cm, while less than 14 cm long are identified as the small fish.
2. Percentage of maturity stage of female, represented by red fish, dividing into 4 level, including, over 80%, 2) 65-80%, 3) 50-65%, and 4) less than 50%
3. Fish larvae abundance, represented by red circle, higher volume are shown with the bigger circle

**LARVAE (INDIVIDUAL) / 1000 LITERS**

- 1 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- 200 - 250

**PERCENT (%) OF FEMALE MATURE**

- 0 - 50
- 🐟 50 - 65
- 🐟 65 - 80
- 🐟 80 - 100

**CAUGHT AVERAGE LENGTH (CM)**

- 0.0 - 10.0
- 🐟 10.0 - 14.0
- 🐟 14.0 - 17.0
- 🐟 17.0 - 25.8

**January (Figure 2)**

mature mackerel were found surrounding Koh Kood near the Cambodian waters. Over 80% of total mackerel were at maturity stage. Mackerel larvae were also found near Koh Kood

**February (Figure 3)**

mature mackerel were found near Koh Kood, in front of Koh Yai, about 3-5 nautical miles from the coastline, as well as in front of Koh Chang. Over 80% of total mackerel were at maturity stage. Mackerel larvae were also found near Koh Chang.

**May (Figure 6)**

-mature mackerel were found at the areas of Klong Yai District, about 3-5 nautical miles from

**June (Figure 7)**

-mackerel were not found in Trat Province

the coastline, as well as in front of Koh Chang. Mackerel larvae were also found surrounding Koh Kood and Koh Chang.

**July (Figure 8)**

- Few mature fish were found in front of Klong Yai District, about 5-10 nautical miles from the coastline.
- Few number of mackerel larvae were appeared.

**September (Figure 10)**

Few mature fish were found in front of Klong Yai District, and Chang Strait, about 5-10 nautical miles from the coastline. No mackerel larvae were appeared.

**November (Figure 12)**

- Few mature fish were found in front of Klong Yai District and near Koh Kood.
- Few number of mackerel larvae were appeared surrounding Koh Kood.

**August (Figure 9)**

- Few mature fish were found at the areas of Koh Kood and Koh Chang.
- Mackerel larvae was not found

**October (Figure 11)**

Mackerel were not found in the areas of Trat Province

**December (Figure 13)**

- Few mature fish were found near Koh Kood.
- Mackerel larvae were also found.

