SEAFDEC/UN ENVIRONTMENT/GEF
Fisheries Refugia Project
Progress Report

By

Department of Fisheries Malaysia

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, 11-13 September

Contents

Other Activities

Fisheries Refugia In Malaysia

Stakeholder Consultations

Work Progress 2017-2018

Scientific Report Tiger Prawn Refugia

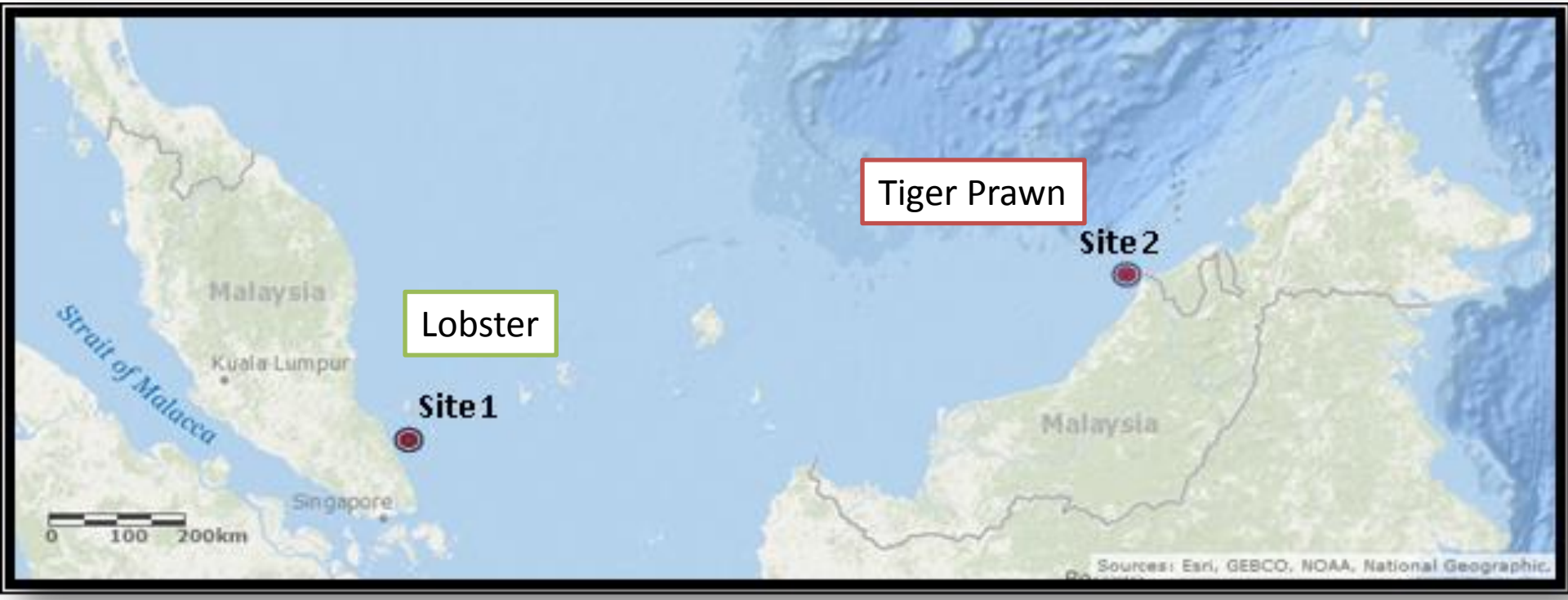
Financial Report

Scientific Report Lobster Refugia

1. Fisheries Refugia in Malaysia

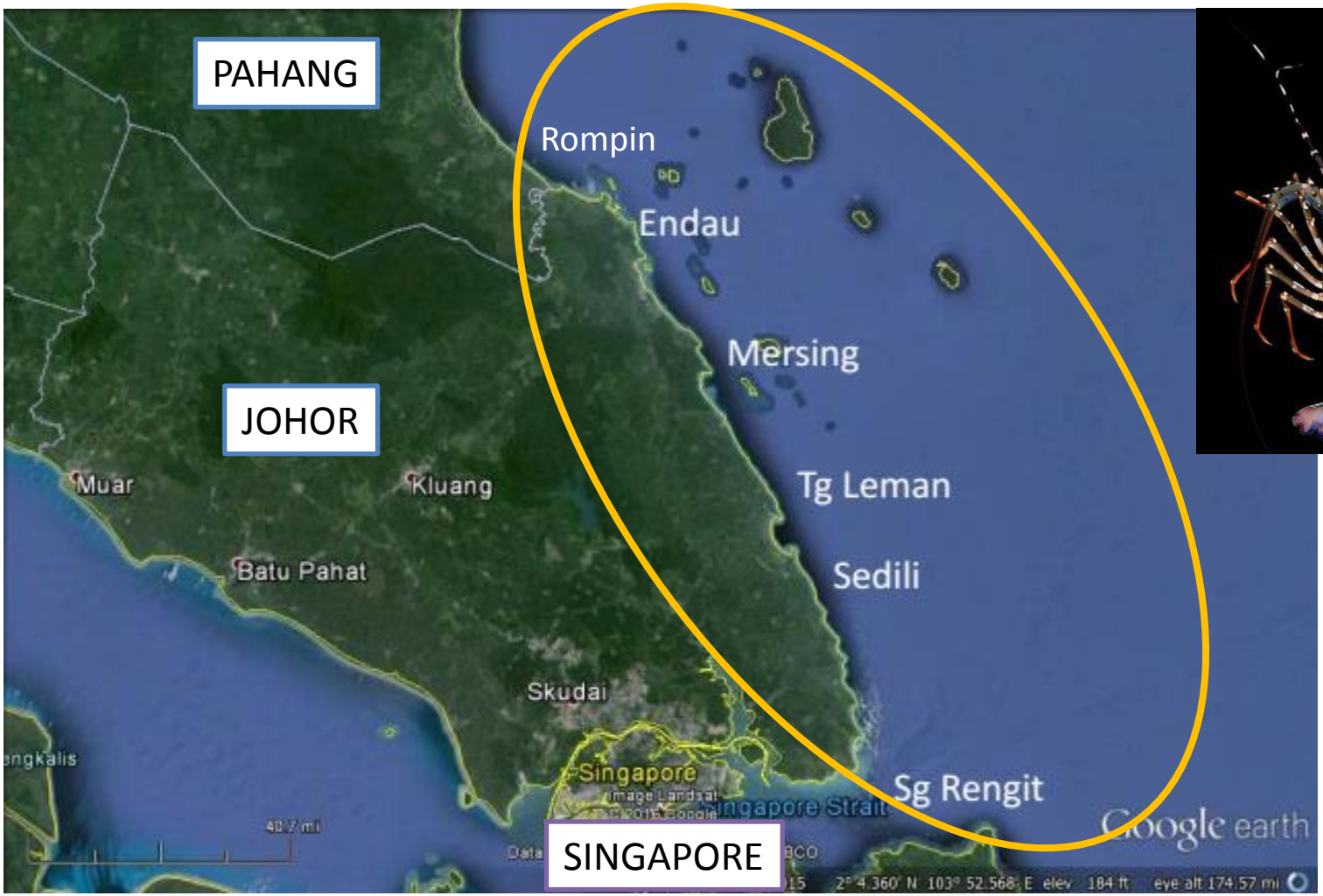
1. Lobster Refugia at Tanjung Leman, Johor
2. Tiger Prawn Refugia at Kuala Baram, Sarawak

Refugia Sites in Malaysia

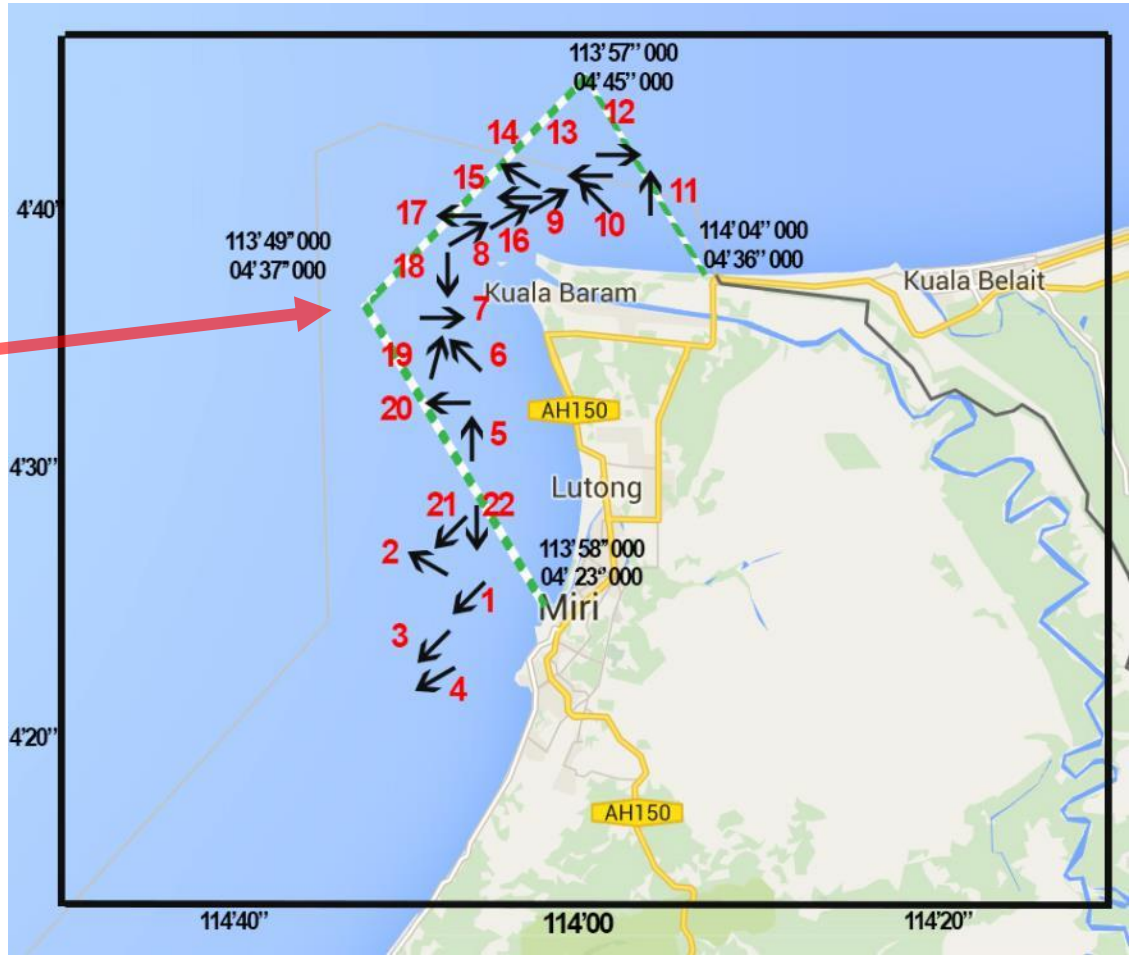


1. Tanjung Leman, Johor – Lobster (*Panulirus* spp.)
2. Kuala Baram, Sarawak – Tiger Prawn (*P. monodon*)

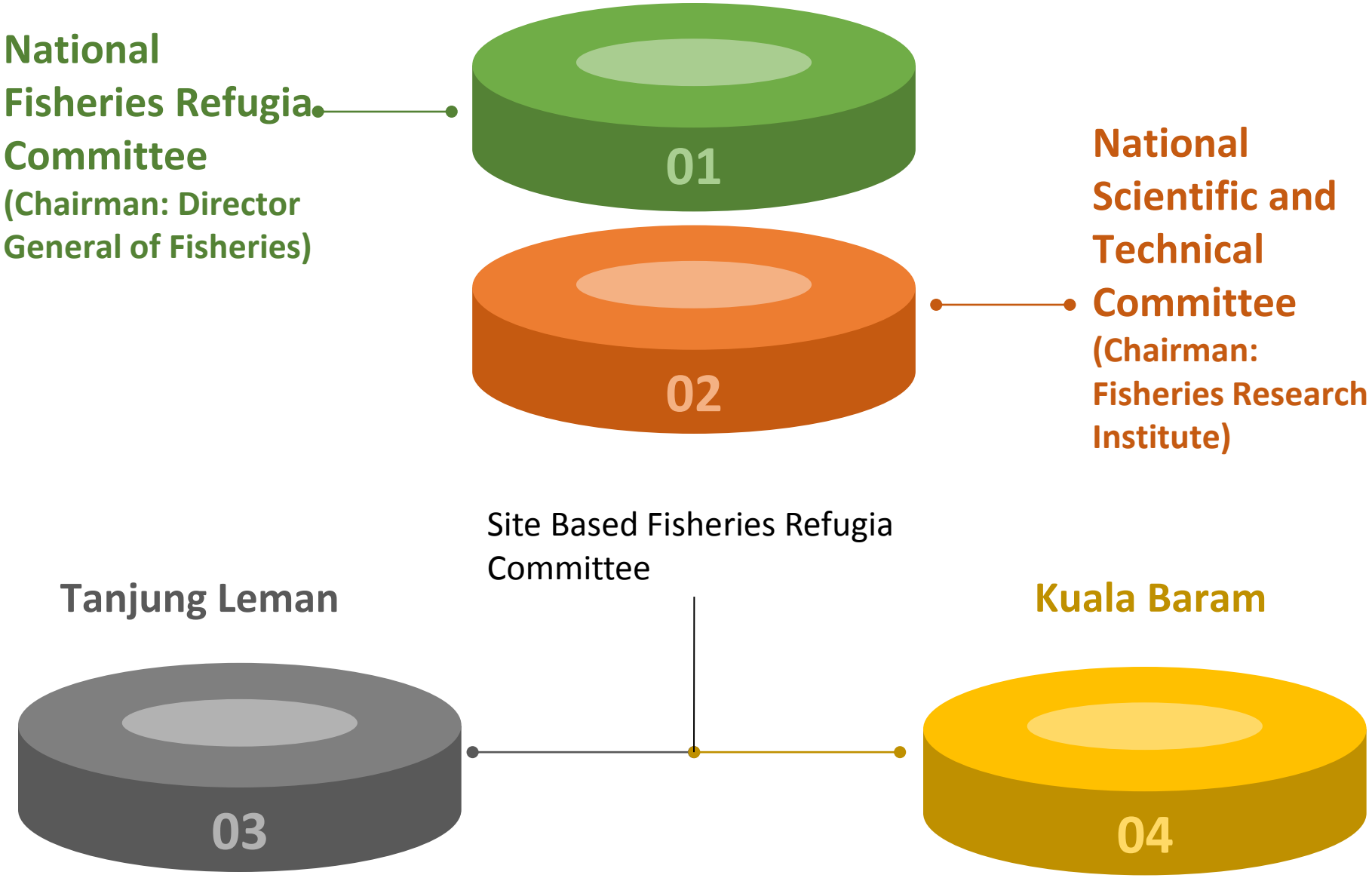
Spiny Lobster Fishery Area at South Pahang-East Johor



Proposed Tiger Prawn Refugia Site at Kuala Baram, Sarawak



National Cordination Mechanism



2. Work Progress 2017-2018

Project Status: Q1

Planned Activities(s)	Anticipated Deliverable/ Timeline	Status
1.1.1 Literature review and data collection	Data profile Agreed physical document	Ongoing compilation of information. Books price exceed stipulated budget
1.1.1 Workshop on past lobster survey data on lobster resource in Johor waters and Tiger Prawn Survey in Sarawak waters	Lobster and tiger prawn fishing area and density map Survey report	A workshop was held on the 29-31 May 2018 for the Lobster project.
1.1.1 Analysis of larvae samples from East Johor	Lobster larvae distribution and density	Completed
1.1.3 Site based survey and reconnaissance for socio-economic study	1 recon survey	Survey conducted for Lobster Refugia (March – August 2018)

Project Status: Q1

Planned Activities(s)	Anticipated Deliverable/ Timeline	Status
1.1.3 Daily collection of lobster and tiger prawns landing data from selected sites: **Site 1: Sedili** **Site 2: Pengerang** **Site 3: Mersing** **Site 4: Rompin** **Site 5: Kuala Baram**	Lobster and tiger prawns landing trend and basic biological information (species, length, weight, egg presence)	Lobster Refugia: Data collection work have started since May 2018 and three (3) field workers were hired to collect lobster landing data from Sedili, Tg. Leman and Endau.
3.2.3 Benchmark and annually track community acceptance of refugia approach as a marine spatial planning tool	-	Information extracted from community consultation sessions and socio-economic survey

Project Status: Q1

Planned Activities(s)	Anticipated Deliverable/ Timeline	Status
3.3.1 Establish 1 Information Center for Refugia Site	To provide technical information and management information for refugia to local community	A Fisheries Refugia Information Center is established at Tanjung Leman Jetty Complex using National Fund.
4.1.1 Develop and agree ToR, membership & operational rules for National Fisheries Refugia Committee	Meeting report including participant list	A NFRC meeting was held in 2017.
4.1.2 Establish and convene quarterly meetings of the National Fisheries Refugia Committee (NFRC)	Meeting report including participant list	A NFRC meeting was held in 2017.

Project Status: Q1

Planned Activities(s)	Anticipated Deliverable/ Timeline	Status
4.1.3 NFRC review and endorsement of quarterly work plans and progress and financial reports, including tracking of continuity of participation of stakeholders	Meeting report including participant list	A NFRC meeting was held in 21st September 2017.
4.2.1 Establish and convene 6 monthly meetings of the National Technical Working Group	Meeting report including participant list	2nd NSTC meeting was held on 4th May 2018
4.2.2 Provision of technical and scientific inputs to planning of activities in components 1, 2 and 3	Compilation of data	2nd NSTC meeting was held on 4th May 2018

Project Status: Q1

Planned Activities(s)	Anticipated Deliverable/ Timeline	Status
4.3.1 Review governance arrangements at each site to identify required ToR and membership of site-based management boards, including links to other local planning bodies	Meeting report including participant list	Site-base Refugia Committee meetings were held for Johor, Pahang and Sarawak
4.3.2 Establish and convene quarterly meetings of site-based management boards	Meeting report including participant list	
4.3.3 Preparation of quarterly work plans and progress and financial reports on activities at each site	quarterly work plans and progress and financial reports	A Project Manager has appointed on 3rd September 2018.

1st National Fisheries Refugia Committee (NFRC) Meeting, 21st September 2017

2nd National Scientific and Technical Committee (NSTC) Meeting, 4th May 2018

Berdiri belakang dari kiri: En. Ryon Siow, En. Abd. Haris Hilmi Bin Ahmad Arshad, En. Mohamed Ridzuan Bin Mohamed Alias, En. Rosidi Bin Ali, En. Bohari Bin Hj. Leng,Dr. Zainoddin Bin Jamari, En. Dolhadi Bin Lihi, Dr. Alias Bin Man, En. Zaidnuddin Bin Ilias dan En. Hadil Bin Rajali

Berdiri depan dari kiri: Pn. Haryati Bt Abd Wahab, Pn. Fadzilah Bt Md. Kassim, Pn. Liza Bt Hj. Long, Cik Annie Nunis Billy, Pn. Hasmayana Bt Yahaya, Cik Nur Hidayah Bt Asgnari dan Pn. Nooraein Bt Hassan

Lobster Refugia Data Analysis Workshop, 29-31 May 2018

Berdiri dari kiri: En. Abd. Haris Hilmi bin Ahmad Arshad, En. Muhammad Hidir bin Mohd Idris, En. Hashim bin Suhaimi dan En. Ryon Siow.

Duduk dari kiri: Cik Nadiayatul Atikah bt Harun, Cik Noor Hanis bin Abu Halim, Cik Nur Hidayah bt Asgnari dan Pn. Zulifah bt Rohani

3. Financial Report Q1 -2018

Budget Allocation

USD 35,235.91

DE RM146,000

USD82,056.23

DE RM340,000

USD27,230

RM112,827.51

Note: Budget allocation from 11th Malaysia Plan (not include OE)
Q1 – 1st remittance from regional funding

South China Sea Fisheries Refugia Initiative

Project Statement of allocation, Expenditure and balance from January 2018 to July 2018

Code	Description	Budget allocation (USD)	Actual Expense (USD)	Balance (USD)
10	PROJECT PERSONNEL COMPONENT			
1100	Project Personnel			
1101	Appointment of project manager	2,750	0	2,750
1199	Sub total	2,750	0	2,750
1200	Consultants	0	0	0
1201	Literature review and data collection	240	0	240
1202	Analysis of larvae sample from East Johor	960	935	25
1299	Sub total	1,200	935	265
1600	Travel on official bussiness (above staff)	0	0	0
1601	Site based survey and reconnaissance for socio-economic study	1,440	946	494
1608	Daily collection of lobster & tiger prawns landing data			
	Sedili			
	Pengerang			
	Mersing			
	Rompin			
	Kuala Baram	9,984	2,158	7,826
1699	Sub total	11,424	3,104	8,320
	COMPONENT TOTAL	**15,374**	**4,039**	**11,335**

Code	Description	Budget allocation (USD)	Actual Expense (USD)	Balance (USD)
20	SUB-CONTRACT COMPONENT			
	COMPONENT TOTAL	**0**	**0**	**0**
30	TRAINING COMPONENT			
3200	Group training			
3201	Workshop on past lobster survey data on lobster resources in johor waters & Tiger prawns survey in sarawak waters	2,400	1,277	1,123
3202	Consultation workshop with the traditional gears fishermen in Rompin	0	0	0
3203	National Fisheries Refugia Committee Meeting	2,400	623	1,777
3204	1 meeting in Johor,Pahang and Sarawak	2,256	519	1,737
3299	Sub total	7,056	2,420	4,636
	COMPONENT TOTAL	**7,056**	**2,420**	**4,636**
40	EQUIPMENT & PREMISES COMPONENT			
4300	Premises	0	0	0
4301	Establish 1 information center for refugia site	4,800	3,480	1,320
4399	Sub total	4,800	3,480	1,320
	COMPONENT TOTAL	**4,800**	**3,480**	**1,320**
50	MISCELLANOUS COMPONENT			
	COMPONENT TOTAL	**0**	**0**	**0**
TOTAL		**27,230**	**9,939**	**17,291**

4. Scientific Reports – Lobster Refugia

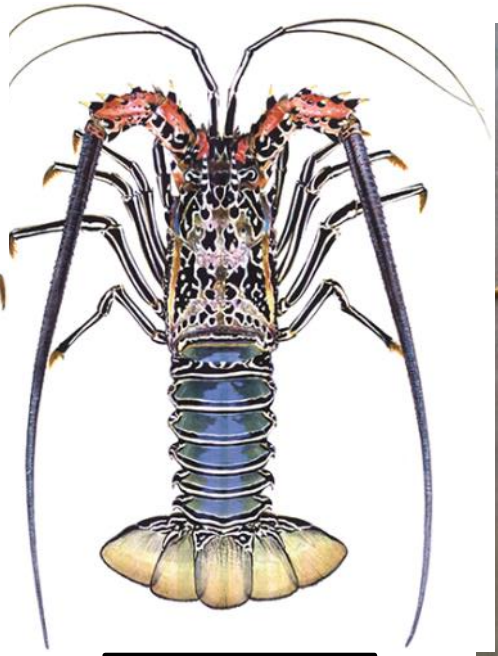
Lobster Study Activities

- Collection of lobster landing data from jetties
- Lobster eggs and maturation observation
- Lobster resource surveys
- Lobster larvae surveys

Types of Lobster Fishing Gear

- Traps
- Drift Net (4-5”)
- Trawl Net

P. ornatus

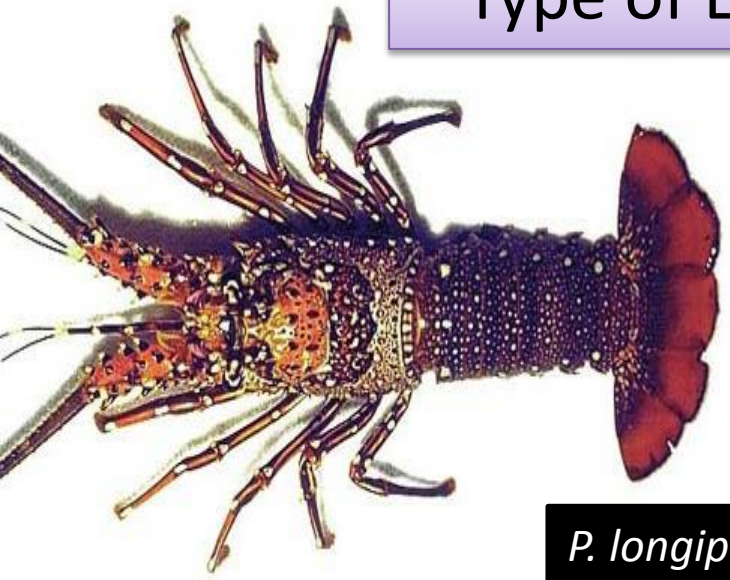


P. versicolor

Panulirus polyphagus

P. homarus

Type of Lobster Species



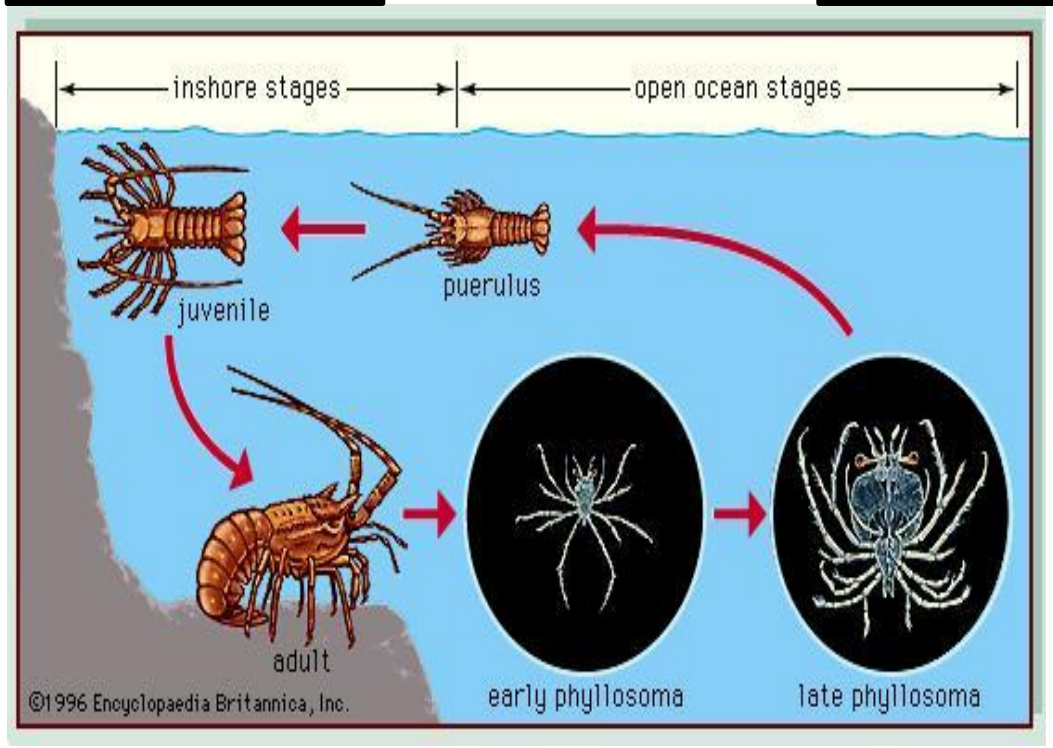
P. longipes

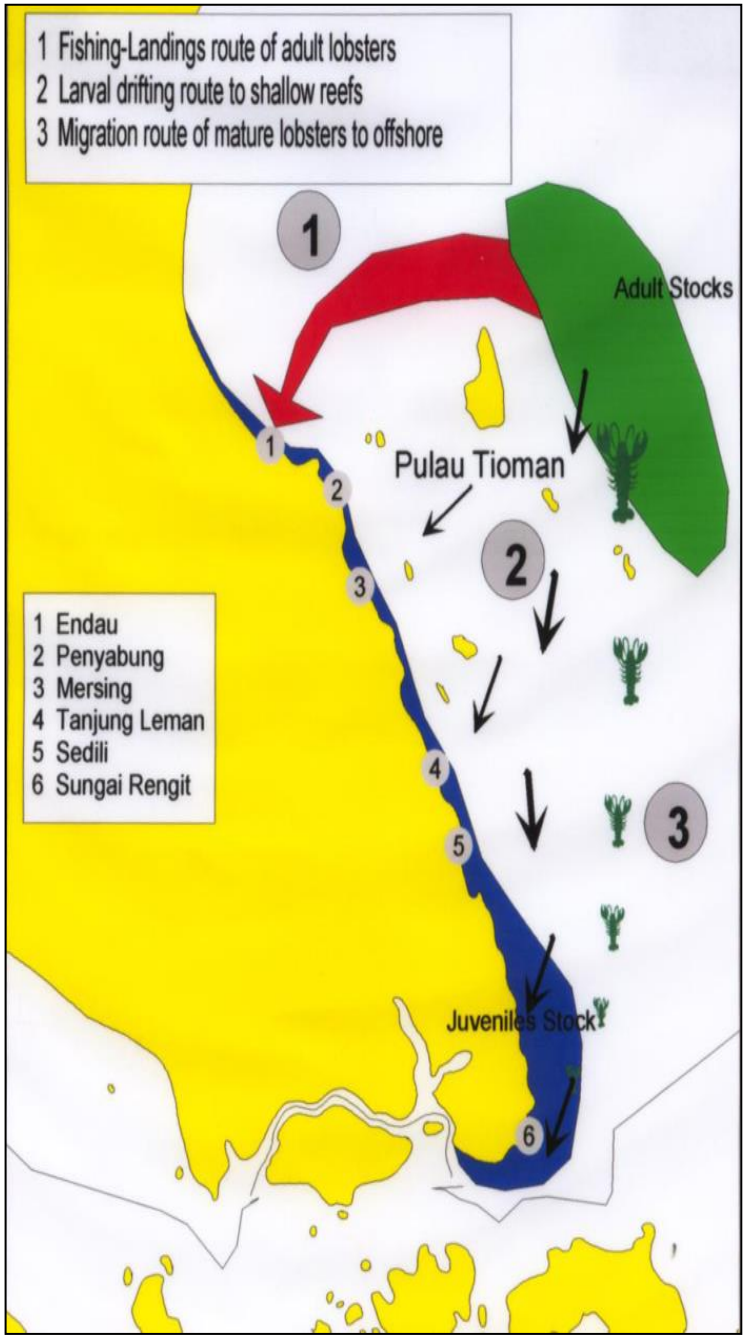
Thenus orientalis

Lobster migration route (hypothesis)

Coastal shoreline

Deeper sea





Source: Alias Man, 2000

Lobsters migrating to their spawning ground (pics from internet)

Lobster Biology

- Female lobsters begin to bear eggs when they reach size of 400g and total length of 200mm (Alias *et al*. 2000)
- Fecundity 72 000 – 945 000 (depending on size) (Kagwade, 1988)
- Size at first maturity (male 51-55 mm CL; female 51-60 mm) (Kizhakudan & Patel, 2010), 80 mm CL (Alias et al. 2000)

Lobster Biology

- Egg-bearing lobsters are usually found during the months of July-September
- This coincide with a previous study by Alias Man (2000), which state that the peak breeding season is in August
- However, further information is needed to determine the spawning location and breeding period

Lobster egg maturity study by university (UMT)

Asian Journal of Cell Biology 9 (1): 1-13, 2014
ISSN 1814-0068 / DOI: 10.3923/ajcb.2014.1.13

Effect of Temperature on Ovarian Maturation Stages and Embryonic Development of Mud Spiny Lobster, *Panulirus polyphagus*

[1]M. Ikhwanuddin, [1]S.N. Fatihah, [1]A.H. Nurfaseha, [2]M. Fathiah, [2]M. Effenddy, [2]A. Shamsudin, [2]A. Siti Aishah and [3]A.B. Abol-Munafi

Lobster egg maturity increases

11 days to hatch

Fig. 6(a-c): Change of egg colour at the pleopods of the *Panulirus polyphagus* broodstock (a) Early stage-bright orange, (b) Middle stage-brick red and (c) Prior to hatching-dark red

Lobster Resource & Larvae Survey, 21-25 Aug 2017 (National Fund)

KK Senangin II

Type: Fish Stern Trawler

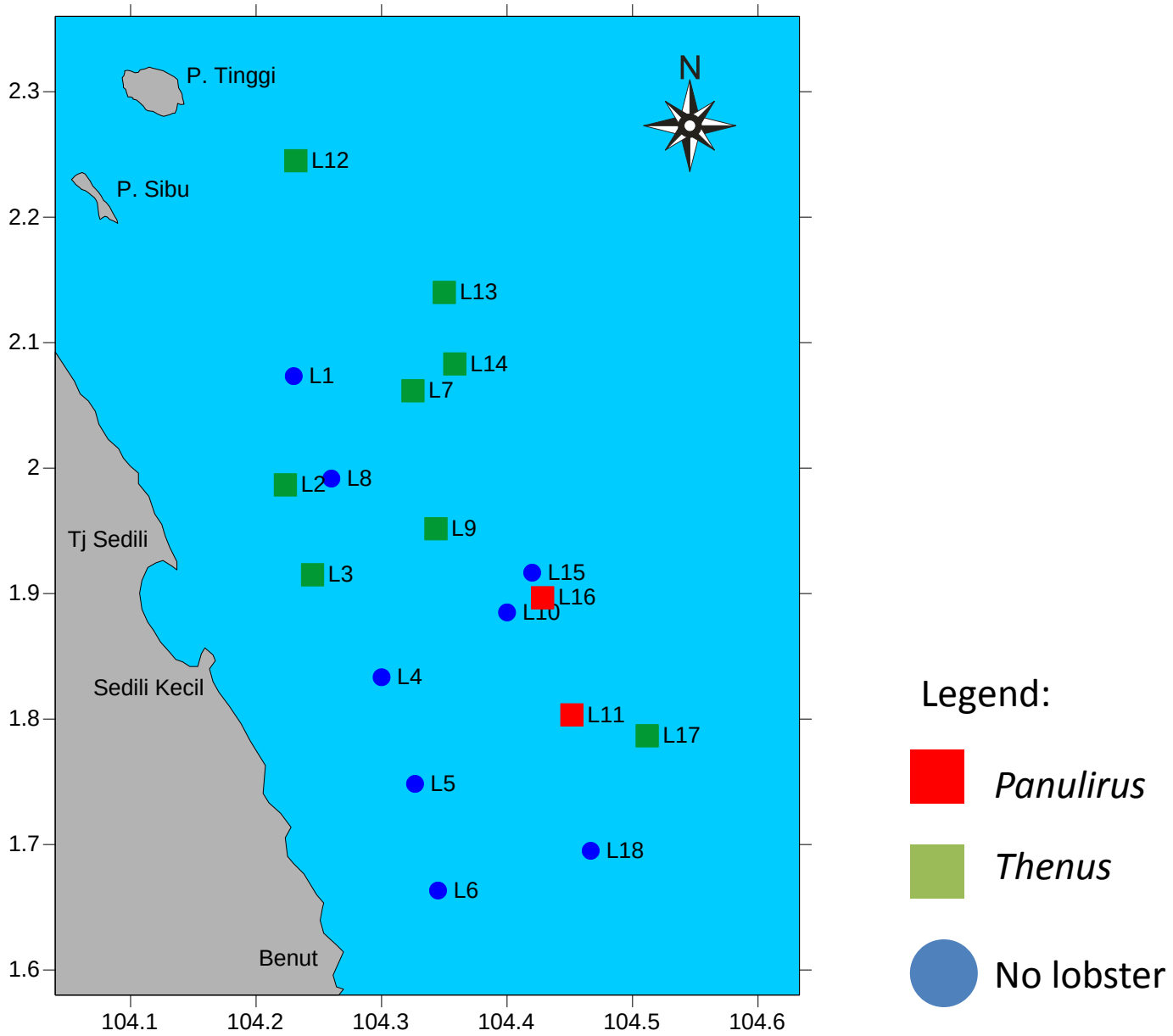
Length: 26 m

Tonnage: 177 GRT

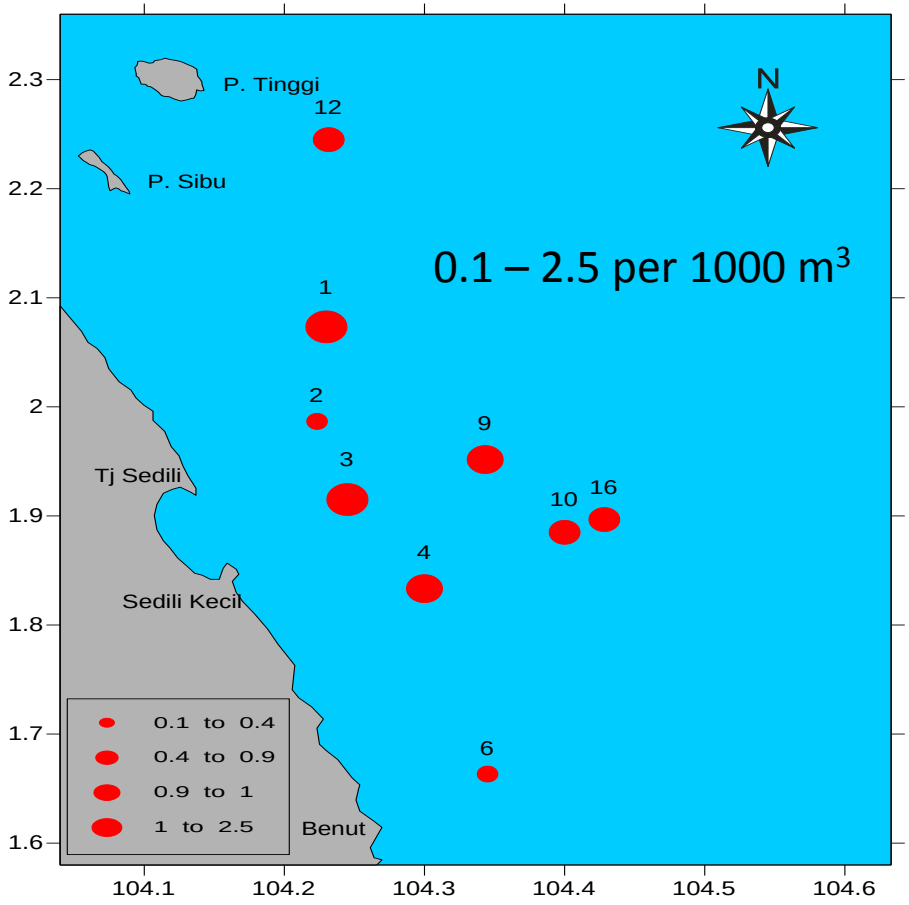
Compliment: 22 persons

Lobster Resource & Larvae Survey, 21-25 Aug 2017

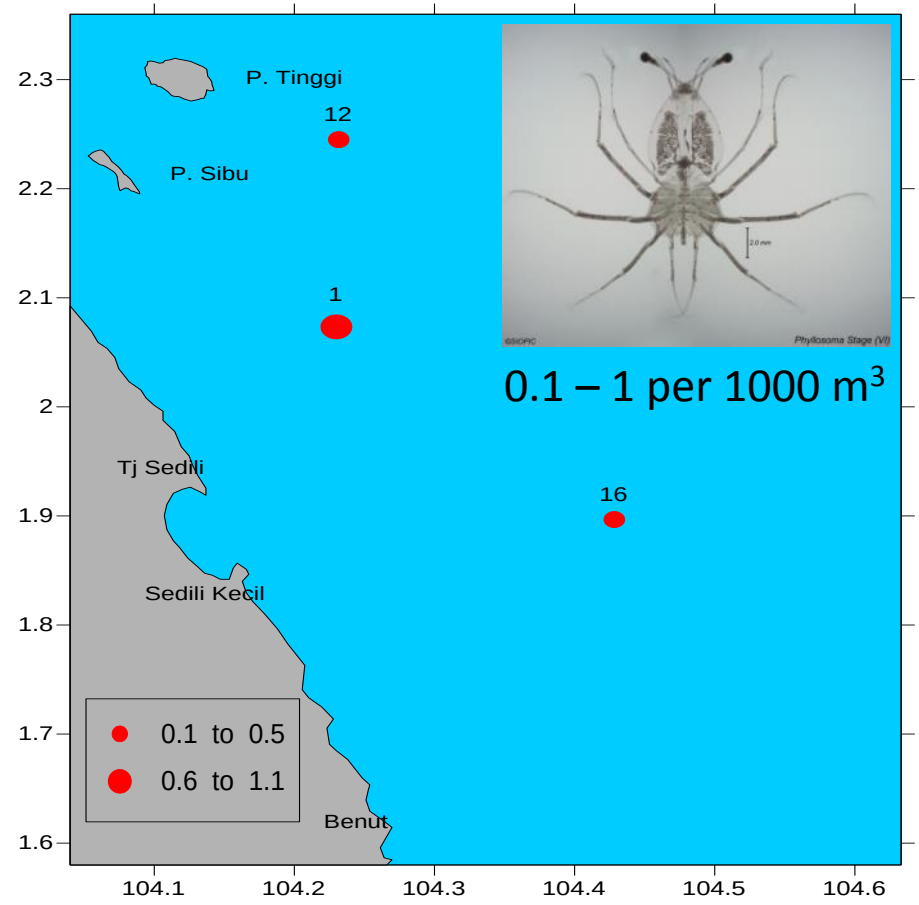
Presence of Lobster (*Panulirus* and *Thenus*) During the 2017 Survey



Lobster Larvae Survey 2017



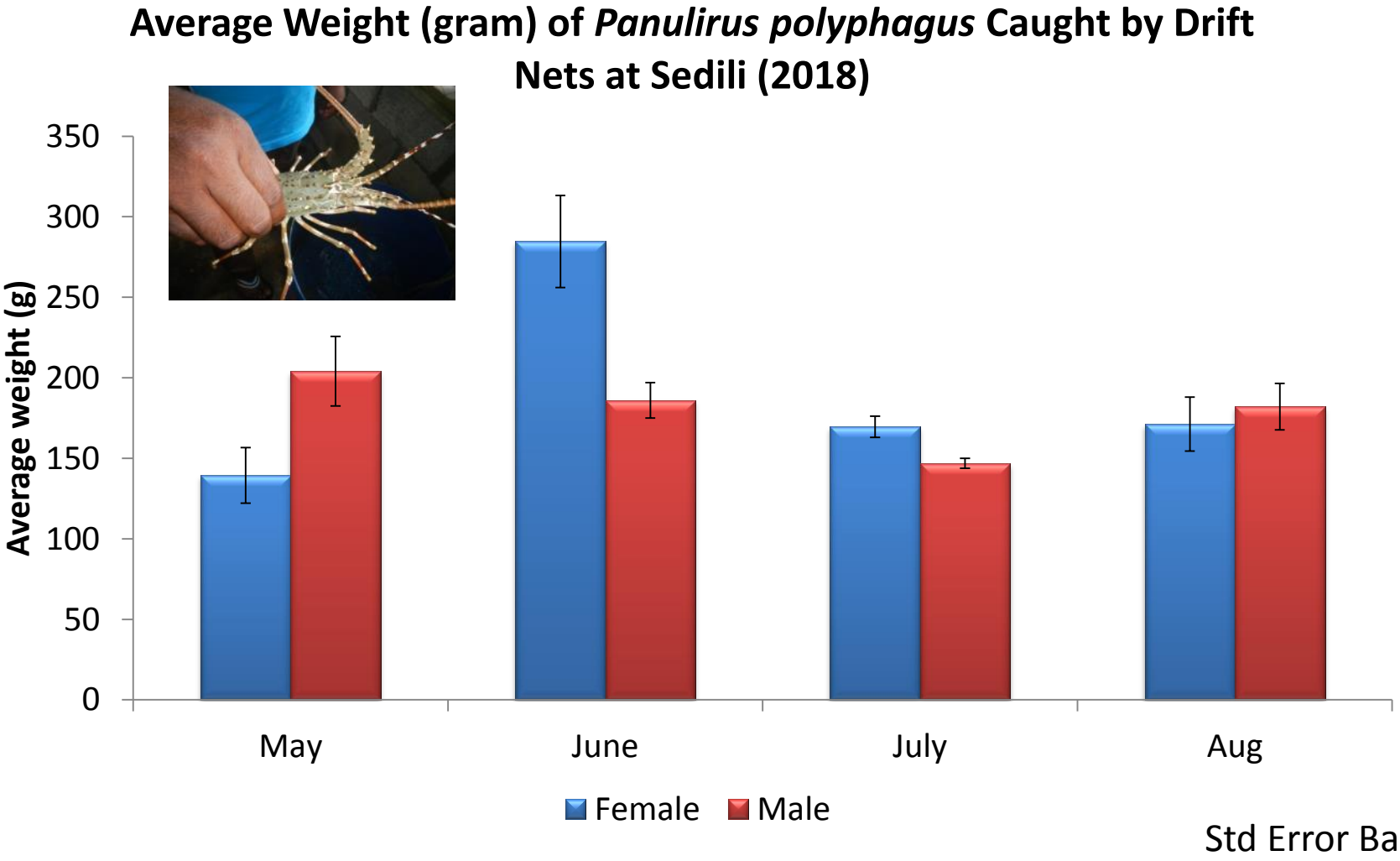
(a) *Panulirus* spp.



(b) *Thenus orientalis*

Density (No./ 1000 m^3) and Distribution of phyllosoma for (a) *Panulirus* spp. and (b) *Thenus orientalis*

Lobster Landing Data at Sedili, Johor

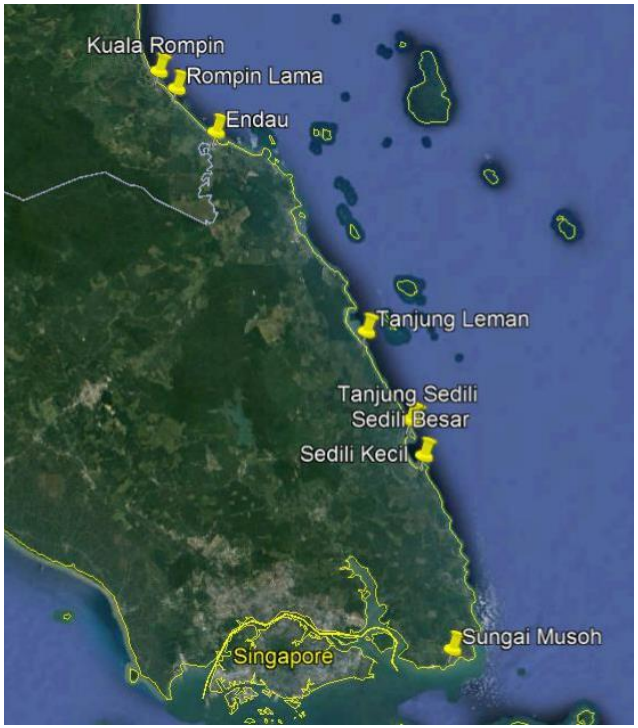


Proposed Lobster Resource & Larvae Study – Oct 2018 (National Fund)

Socio-economic Survey of Lobster Fishermen

- A baseline socio-economic survey of fishers covering eight fishing areas in Pahang-Johor was undertaken during March to August 2018.

138 respondents



Base	% respondents
Kuala Rompin	10.1
Rompin Lama	3.6
Endau	3.6
Tanjung Leman	14.5
Tanjung Sedili	11.6
Sedili Besar	13.8
Sedili Kecil	15.2
Sungai Musoh	27.6

Socio-economic Survey of Lobster Fishermen – Preliminary Findings

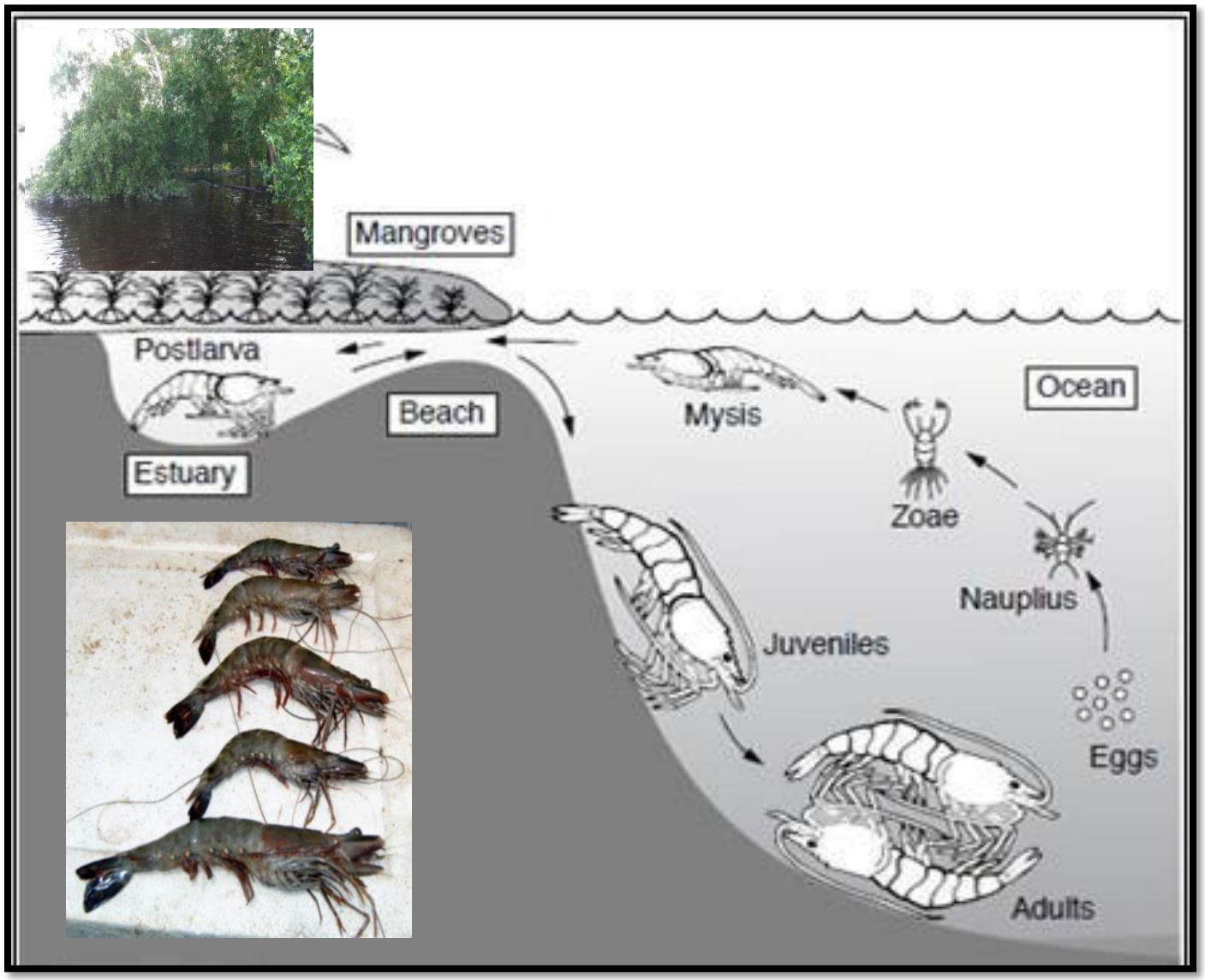
- 88.19% of respondents **agreed** with the establishment of refugia as proposed by DoF.
-
- 85.29% of respondents **agreed** not to conduct fishing operation of lobster during its breeding season after the establishment of refugia.

- 97.06% of respondents **agreed** that the Department of Fisheries should discuss with the fishers and fishers 'community regarding the proposal of the establishment of lobster refugia in the beginning.

Socio-economic Survey of Lobster Fishermen

5. Scientific Reports – Tiger Prawn Refugia

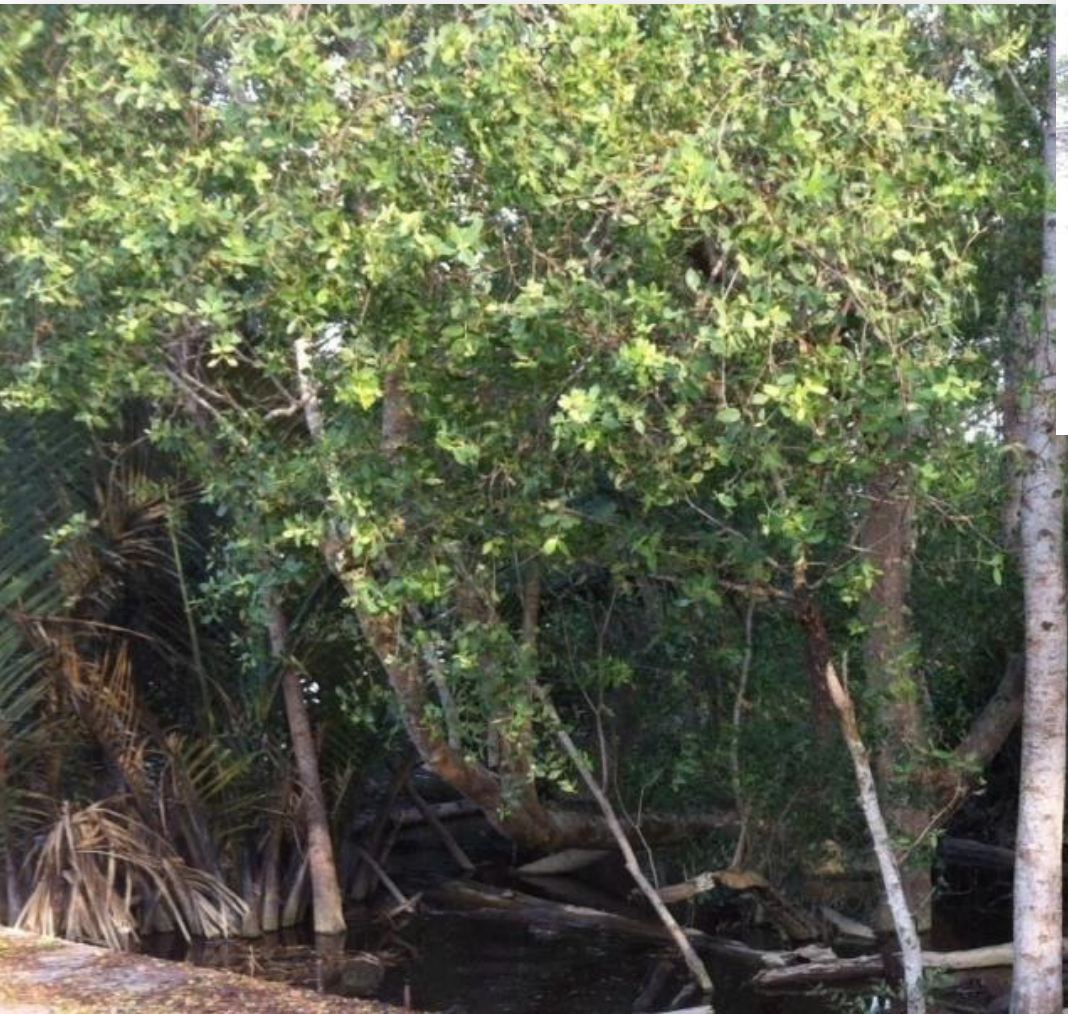
Tiger Prawn Life Cycle



Tiger Prawn Critical Phases

Life-history phase	Known habitat/ critical area	Threat
Early-life history	Ocean water up to 130m (muddy/sandy/rocky)	Filtering, predator (whale, manta-ray)
Juvenile	Seagrass/ mangrove/ estuary	deforestation
Pre-recruit	Seagrass – salty water (25-30ppt)	Shrimp push net & bag net
Adult	Deepwater (20-50m)	Trawl net
Spawning	Oceanic water	Trawl net

Mangrove Forest of Kuala Baram



List of Activities (2017-2018)

- Tiger prawn landing data collection
- Data collection on maturity level-percentage of maturity level
- Consultation with fishermen and stakeholders
- Identification of nursery areas for juvenile in Baram River

Studies conducted by FRI Bintawa since 1998

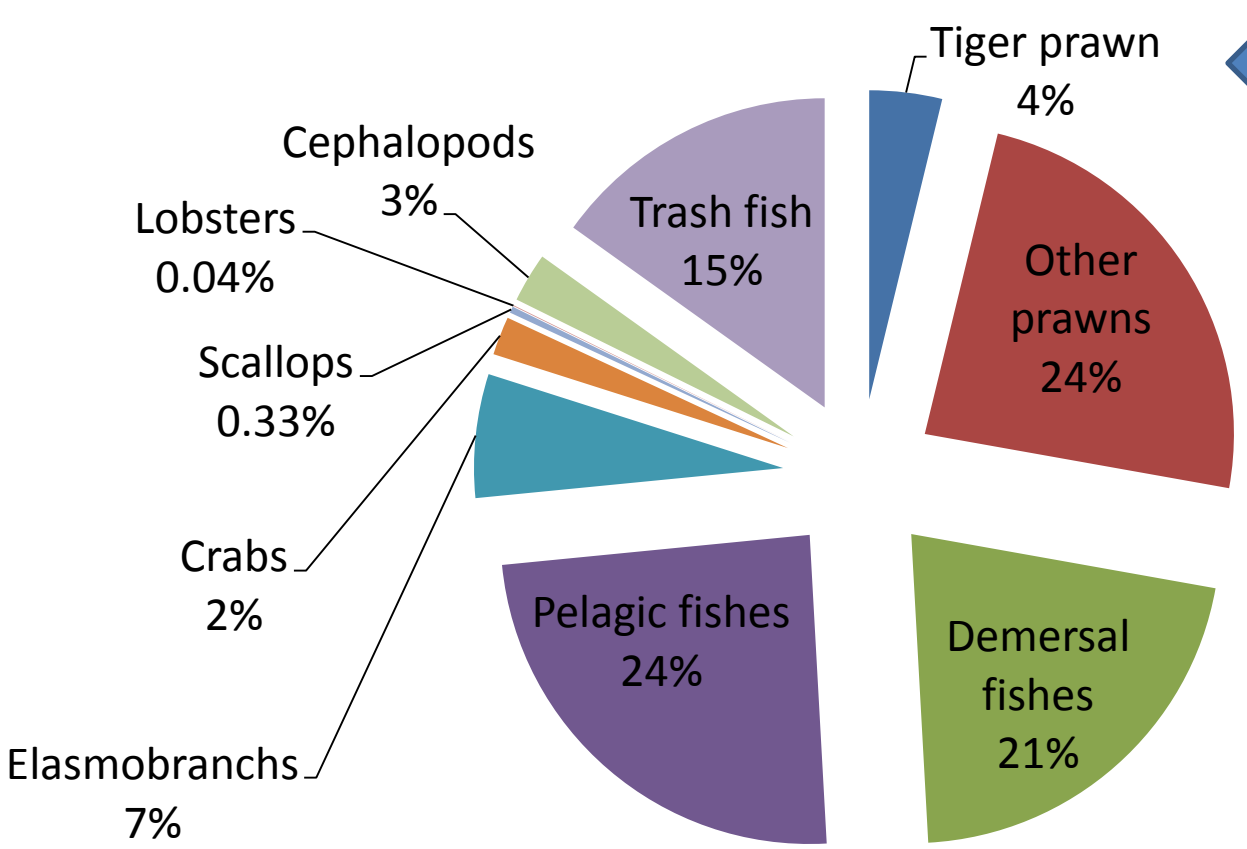
- Hadil, R. and A.L. Faazaz (1998). Tiger prawn, *Penaeus monodon* broodstock resource of Sarawak. *Fisheries Research Institute Bintawa Newsletter* 1998 (mimeo.).

- Hadil bin Rajali and Albert Chuan Gambang, 2001. Resource assessment of the tiger shrimp, *Penaeus monodon* of Kuala Baram, Miri-Sarawak. *Malaysian Fisheries Journal* 2 (1): 221-237 (June 2001).

- Hadil bin Rajali, 2004. The bioeconomics of tiger shrimp broodstock fishery of Kuala Baram. *Malaysian Fisheries Journal* 3 (2) : 106-114

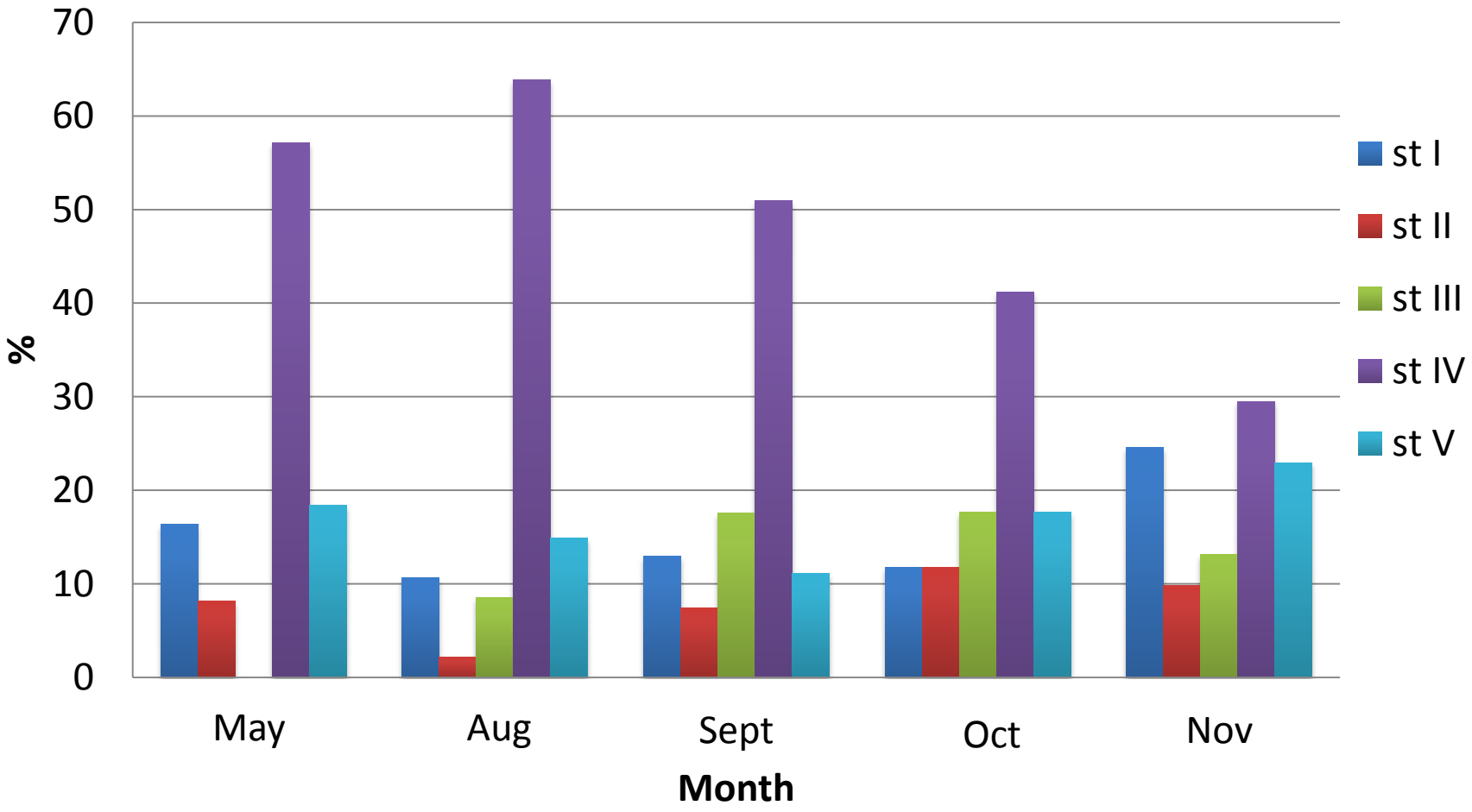
- Hadil bin Rajali. 2012. The tiger shrimp, *Penaeus monodon* resource of Miri. FT Labuan & Sabah. In *Proceedings of National Fisheries Seminar 2014*. Fisheries Research Institute, Department of Fisheries Malaysia.

Catch Composition of Trawlers in Kuala Baram, Miri



Tiger prawn attributed only 4 %

Maturity Level (%) of Tiger Prawn Gonad (Stage I - IV)

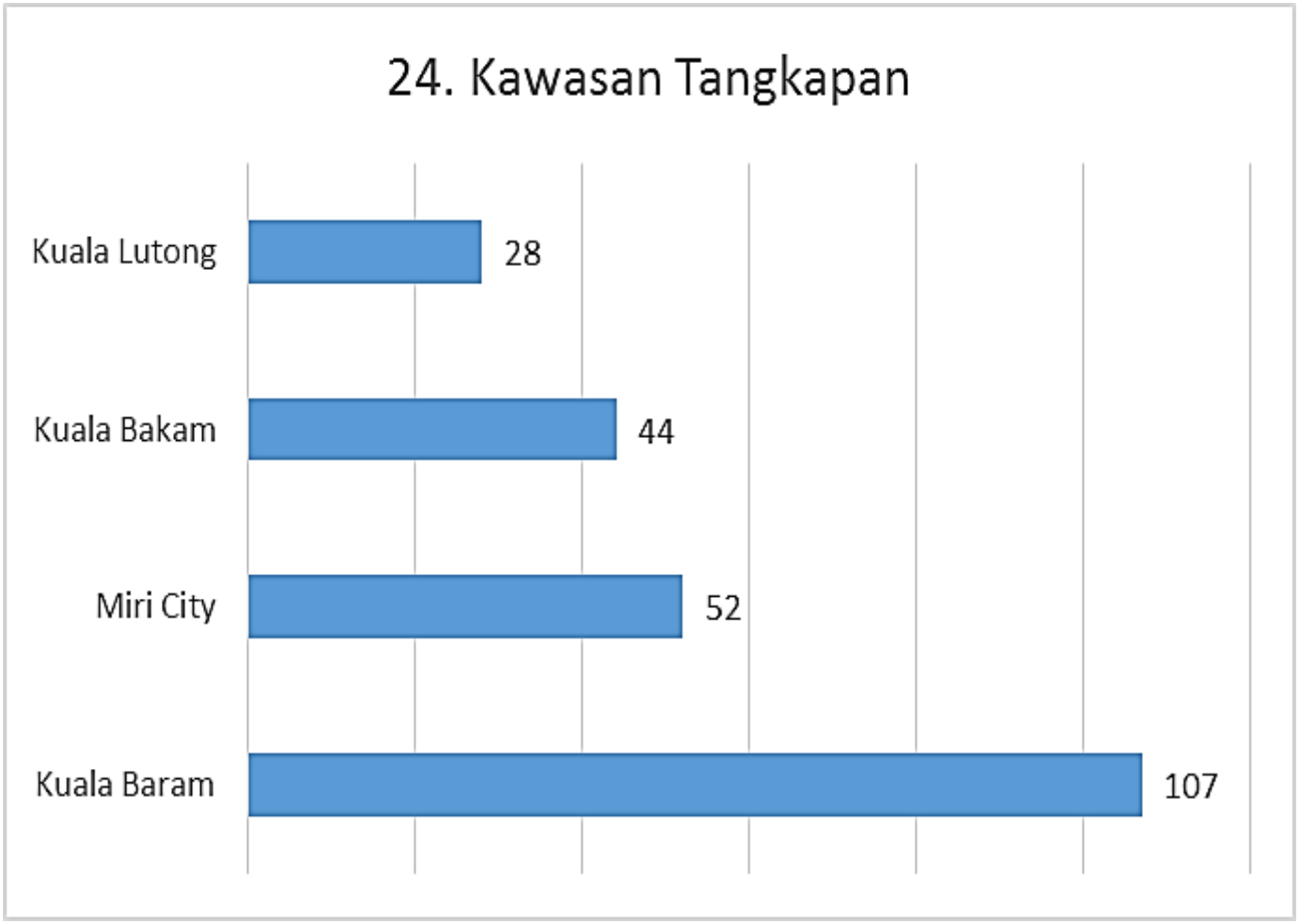


Juvenile Prawn Survey

Boat used for the juvenile survey

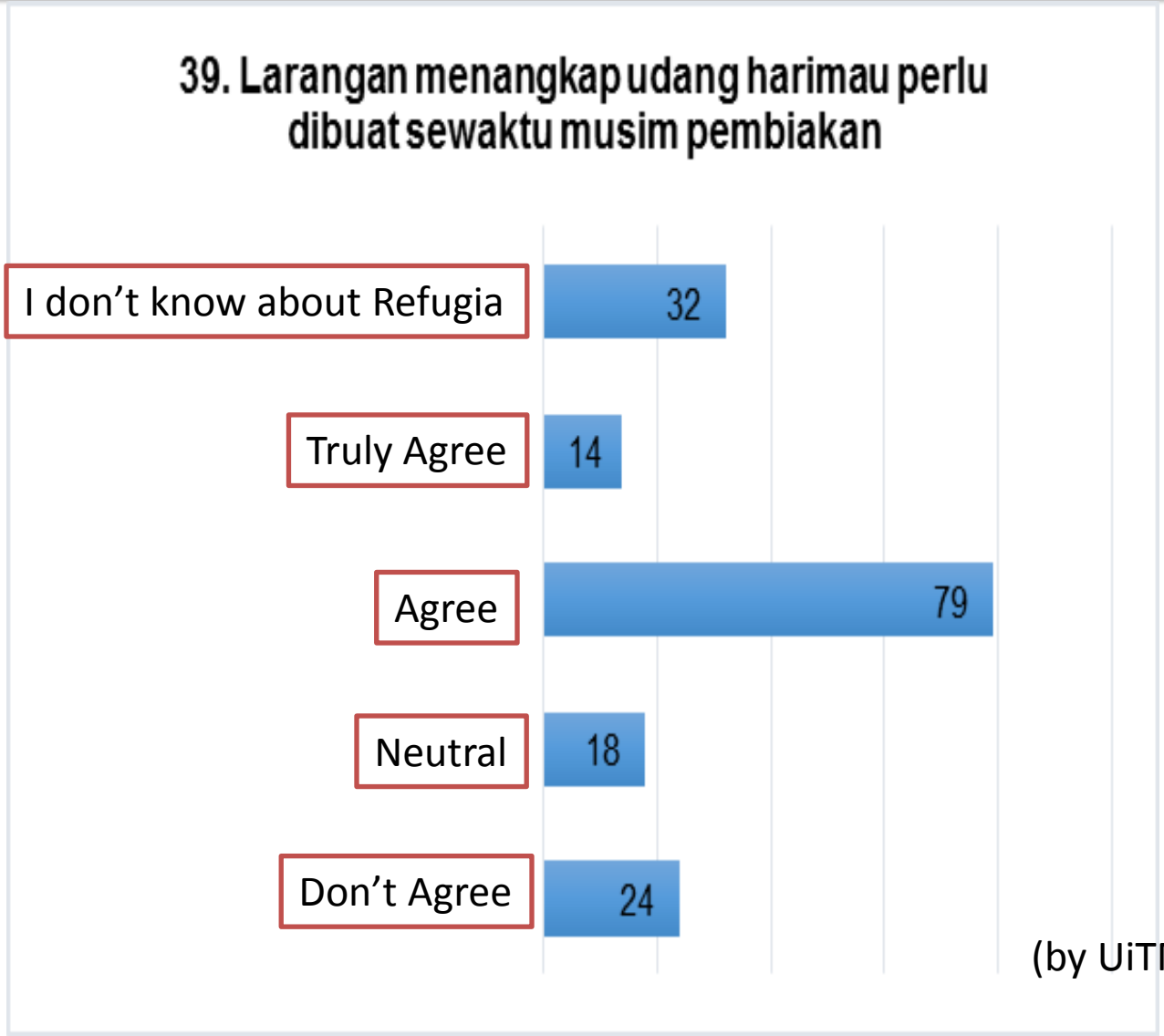
Catch composition of mixed species of fish and prawn

Socio-economic Study (by UiTM-JPLS, 2016)



Number of respondents: 231

Prohibition of Tiger Prawn Fisheries during Breeding Season



(by UiTM-JPLS, 2016)

6. Stakeholder Consultations

Fishermen Consultation Session
19th July 2017 (Miri, Sarawak)

Tempatan

Jabatan Perikanan Miri mampu jana RM27 juta

Ia hasil jualan induk udang jika cadangan jadikan Kuala Baram refugia udang harimau jadi kenyataan

"Kita menjalankan kajian tentang udang di seluruh kawasan di Sarawak sejak awal 1990-an dan kita dapati hanya di kawasan Miri iaitu Kuala Baram terdapat udang harimau."

瓜拉峇南水域列虎蝦培育區

Tiger prawns refuge centre to be set up in Kuala Baram

By Mohamad Abdullah

MIRI: The Fisheries Department will set up a refuge centre for tiger prawns, which are commonly found in the waters off Kuala Baram, as a way to stop overharvesting.

Fisheries Research Institute Sarawak Labuan senior research officer Hadil Rajali disclosed that based on investigation, at least 67 fishing trawler operators have been harvesting tiger prawns off Kuala Baram since 1997.

"There is a need to control harvesting by setting up a refuge centre here (Kuala Baram) to manage the prawn population," he said during a function with stakeholders involved in tiger prawns here yesterday, where state Fisheries Department director Belayong Nyuak, its head of enforcement Fairol Tajuddin Suhaili, and Miri Fisheries Department Region III officer Buniamin Kiprawi were present.

The participants included members of Miri Fishermen Association, fishermen from Kuala Baram up to Bakam, trawler operators, as well as representatives from the Marine Police, Miri Resident's Office, Malaysian Maritime Enforcement Agency (MMEA) and Fisheries Department.

According to Hadil, the proposed centre for tiger prawns would extend about five to seven nautical miles off the coastlines of Tanjung Baram to Kuala Bakam, and with a depth of 50m - covering an area of 295.5 square miles.

He said the area is suitable for the breeding of tiger prawns because of the presence of mangrove trees and 'nipah' (estuary palms). Once completed, the centre would be closed to trawlers from May to September every year - the breeding season for the prawns.

Hadil also said based on a research done in 2015, about 18,000 tonnes of tiger prawns were harvested off the shores here, bringing in revenues to the tune of RM26.84 million annually.

Tiger prawns are also found in the waters off Samatan and Bintulu but those found off Kuala Baram are said to be much superior - perhaps due to its more favourable ecology and habitat.

Hadil and Belayong (front, fifth and sixth right, respectively) in a photo-call with those attending the function.

Big tiger prawns are common in the waters off Kuala Baram.

Fishermen (Artisanal) Consultation Session, 20th Aug 2017 (Sedili, Johor)

Fishermen (Trawlers) Consultation Session, 30th July 2018 (Endau, Johor)

Fishermen (Trawlers) Consultation Session, 31th July 2018 (Sedili, Johor)

Fishermen Consultation Session
29th Aug 2018 (Rompin)

6. Other Activities

Refugia Information Center, Tanjung Leman, Johor (officited on 20 Nov 2017)

Refugia Technical Support Mission
25-26 July 2018

thank you