



**Establishment and Operation of a Regional System of
Fisheries *Refugia* in the South China Sea and Gulf of Thailand**

REPORT

**THE BASELINE SURVEY OF SHORT MACKEREL
AND FISH LARVAE COLLECTION**

**KOH KONG, CAMBODIA
06-11 APRIL 2019**

Prepared by
FISHERIES ADMINISTRATION, CAMBODIA

SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
TRAINING DEPARTMENT



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1. Field Trip Objective

- 1) To monitor mackerel gonad development and collect sampling fish larvae in Koh Kong province from 06 to 11 April 2019 under the support of SEAFDEC/UNEP/GEF.

2. Involved Person

- 2) There are four leaders and officers from Department of Fisheries Conservation and two officers from Fisheries Administration Cantonment in Koh Kong, participating in doing a research of baseline survey short mackerel or Indo-Pacific mackerel in Koh Kong province naming as following (see Annex 1, 2 & 5):
 - Mr. Leng Sy Vann, Deputy Director of the Department of Fisheries Conservation and NSTFP
 - Mr. Prak Tith, Vice chief of Socioeconomic Division, Marine Fisheries Research and Development Institute (MFRDI)
 - Mr. Rous Saret, Officer of Department of Fisheries Conservation
 - Mr. Lieng Saroeun, Vice chief of Crocodile Industrial development and conservation Department of Fisheries Conservation
 - Miss Map Chanda, 3rd year-student from RUA in the Faculty of Fisheries Science
 - Mr. Nou Ngoy, Vice Chief of Fisheries Administration Division, Koh Kong FiAC
 - Mr. Seng Bunna, Vice Chief of Fisheries Administration Division, Koh Kong FiAC

3. Field Trip Activities

A. Collection of fish samples at landing sites and markets

- 3) Teamwork from FiA and FiAC went down to collect the sampling short mackerel of 10kg at Dornng Tung market and Village 4 market on 07 April 2019 in order to operate and monitor fish gonad growth, prepare and store its DNA. Those fish is caught at Koh Yor and Koh Code according to fishermen and sellers (see annex 2).

B. Operating fish to monitor mackerel gonad growth

- 4) 86 fish samples are operated to monitor its gonad development, including 75 females and 11 males (see annex 2 & 4).
- 5) According to data analysis of female mackerel, its average total body weight is 52.24g, average total body length is 16.25cm, and average gonad weight is 0.70g. For its gonad stage, it varies from 1st stage to fifth stage, including 26 fish in fifth stage, 21 fish in fourth stage, 12 fish in third stage, 9 fish in 2nd stage, and 7 fish in 1st stage.
- 6) For the male, its average total body weight is 50.17g, average total body length is 16.15cm, and average gonad weight is 0.32g. As for its gonad stage, it varies from 1st stage to fifth stage, including four fish in 1st stage, one fish in 2nd stage, one fish in 3rd stage, one fish in fourth stage, and four fish in fifth stage.

C. Preparing and storing DNA

- 7) Teamwork prepared and cut the part of 30 fish bodies and tails that are stored in small plastic tubes to check its DNA (see annex 3).

D. Sampling fish larvae collection

- 8) Teamwork from FiA and FiAC went down to collect sampling fish larvae at Koh Yor, Chroy Pros, and Peam Krasob sites that are 8 stations. The bongo net with the size of 0.45 cm diameter and 1.5 meter length was applied to collect sample fish larvae and two times per one station was conducted to harvest fish larvae. All sampling fish larvae were stored and kept in plastic tube with ethanol of 99.7%.

ANNEX 1**List of participants attending the baseline survey of short mackerel gonad development from 09 to 13 March 2019 in Koh Kong province**

Name	Sex	Title	Organization	Telephone
1. Leng Sy Vann	M	Deputy Director	DFC/FiA	017446373
2. Prak Tith	M	Officer	DFC/FiA	077926646
3. Lieng Saroeun	M	Vice chief of Crocodile industrial and conservation division	DFC/FiA	092660267
4. Rous Saret	M	Officer	DFC/FiA	011664696
5. Seng Bunna	M	Vice chief of Fisheries Administration Division	Koh Kong FiAC	016885709
6. Nou Ngoy	M	Vice chief of Fisheries Administration Division	Koh Kong FiAC	016933192
7. Map Chanda	F	Student	Faculty of Fisheries Science /RUA	077511674

ANNEX 2**Schedule for baseline survey of short mackerel gonad development from 09 to 13 March 2019 in Koh Kong province**

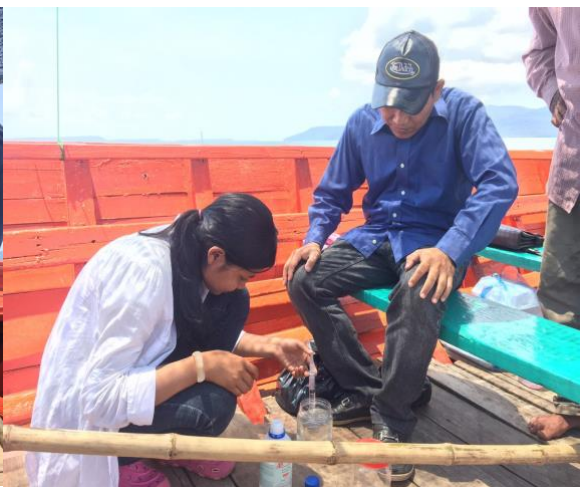
Date/Time	Description	Responsible person
06 April 2019		
9:00am-4:00pm	Leaving Phnom Penh for Koh Kong	<ul style="list-style-type: none"> • Mr. Lieng Saroeun, • Mr. Leng Sy Vann, • Mr. Prak Tith, and • Mr. Rous Sareth • Miss Map Chanda
07 April 2019		
9:00am- 12:00pm	Collection of fish sample at fishing ground at Village 4 and Dornng Tung market	All
12:00pm-2:00pm	Lunch break	All
2:00pm-5:00pm	Fish operation to monitor fish gonad and DNA	All
08 April 2019		
8:00am-1:00pm	Sample fish larvae collection at station 2, 4, 1 and 7	All
1:00pm -3:00pm	Lunch break	All
3:00pm -5:00pm	Fish operation to monitor fish gonad and DNA	All
09 April 2019		
8:00-1:00pm	Sample fish larvae collection at station 6 and 8	All
1:00pm-3:00pm	Lunch break	All

3:00pm -5:00pm	Fish operation to monitor fish gonad and DNA	All
10 April 2019		
8:00-12:00pm	Sample fish larvae collection at station 3 and 5	All
12:00pm-2:00pm	Lunch break	All
2:00pm-4:00pm	Fish operation to monitor fish gonad and DNA	All
11 April 2019		
9:00am-4:00pm	Leaving Phnom Penh for Koh Kong	All

ANNEX 3

Participants' Photos attending the baseline survey of short mackerel gonad development from 06 to 11 April 2019 in Koh Kong province





ANNEX 4
Data of baseline survey of short mackerel in Koh Kong on 06 to 11 April 2019

No.	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD ¹
KKDT0001	16.0	14.2	3.7	47.7	F	4	0.60	1.26	DT Market	SM	8/4/19	3.84
KKDT0002	16.3	14.9	3.6	55.7	F	1	0.20	0.36	DT Market	SM	8/4/19	4.14
KKDT0004	17.2	15.4	4.0	65.4	F	4	1.30	1.99	DT Market	SM	8/4/19	3.85
KKDT0005	16.0	14.3	3.6	52.6	F	4	1.00	1.90	DT Market	SM	8/4/19	3.97
KKDT0006	16.0	14.3	3.5	50.9	F	5	0.90	1.77	DT Market	SM	8/4/19	4.09
KKDT0010	16.2	14.5	3.6	47.3	F	5	0.30	0.63	DT Market	SM	8/4/19	4.03
KKDT0011	16.4	15.0	3.7	54.3	F	5	0.30	0.55	DT Market	SM	8/4/19	4.05
KKDT0012	16.5	15.0	3.7	55.7	F	4	1.10	1.97	DT Market	SM	8/4/19	4.05
KKDT0013	16.1	14.5	3.5	47.8	F	2	0.30	0.63	DT Market	SM	8/4/19	4.14
KKDT0014	17.0	15.1	3.9	59.0	F	3	2.50	4.24	DT Market	SM	8/4/19	3.87
KKDT0015	17.0	15.1	3.9	57.1	F	3	0.90	1.58	DT Market	SM	8/4/19	3.87
KKDT0016	16.0	14.5	3.7	54.6	F	5	0.40	0.73	DT Market	SM	8/4/19	3.92
KKDT0017	15.9	14.2	3.5	50.2	F	5	0.30	0.60	DT Market	SM	8/4/19	4.06
KKDT0018	16.1	14.4	4.4	51.2	F	4	0.50	0.98	DT Market	SM	8/4/19	3.27
KKDT0019	16.1	14.8	3.5	51.3	F	5	0.70	1.36	DT Market	SM	8/4/19	4.23
KKDT0020	16.0	14.3	3.5	53.4	F	4	0.50	0.94	DT Market	SM	8/4/19	4.09
KKDT0021	16.4	15.0	3.5	55.4	F	5	0.40	0.72	DT Market	SM	8/4/19	4.29
KKDT0022	16.4	14.9	3.6	53.4	F	1	0.00	0.00	DT Market	SM	8/4/19	4.14
KKDT0023	16.0	14.4	3.4	47.7	F	2	0.40	0.84	DT Market	SM	8/4/19	4.24
KKDT0024	16.0	14.2	3.3	46.9	F	5	0.30	0.64	DT Market	SM	8/4/19	4.30
KKDT0025	16.5	14.9	3.6	57.0	F	3	0.60	1.05	DT Market	SM	8/4/19	4.14
KKDT0026	16.3	14.9	3.5	50.6	F	3	0.50	0.99	DT Market	SM	8/4/19	4.26

¹ Fork Length (FL)/Body Deep(BD): less than or equal to 4.30 is short mackerel (SM), *Rastrelliger brachysoma*
more than 4.30 is long mackerel (LM), *Rastrelliger kanagurta*.

No.	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD ¹
KKDT0027	16.3	14.6	3.6	53.5	F	3	0.30	0.56	DT Market	SM	8/4/19	4.06
KKDT0028	17.0	15.2	3.7	57.3	F	5	0.80	1.40	DT Market	SM	8/4/19	4.11
KKDT0029	16.6	15.0	3.5	51.1	F	5	0.60	1.17	DT Market	SM	8/4/19	4.29
KKDT0031	16.1	14.5	3.4	47.9	F	2	0.20	0.42	DT Market	SM	8/4/19	4.26
KKDT0032	16.3	14.8	3.5	53.2	F	5	0.90	1.69	DT Market	SM	8/4/19	4.23
KKDT0034	16.5	14.9	3.6	53.9	F	5	0.70	1.30	DT Market	SM	8/4/19	4.14
KKDT0035	16.0	14.5	3.5	53.0	F	4	1.10	2.08	DT Market	SM	8/4/19	4.14
KKDT0037	16.5	14.9	3.5	54.6	F	4	2.10	3.85	DT Market	SM	8/4/19	4.26
KKDT0038	16.3	14.6	3.5	47.1	F	5	0.30	0.64	DT Market	SM	8/4/19	4.17
KKDT0039	16.2	14.5	3.5	51.4	F	5	0.30	0.58	DT Market	SM	8/4/19	4.14
KKDT0040	16.8	14.9	3.7	55.2	F	5	0.40	0.72	DT Market	SM	8/4/19	4.03
KKDT0042	16.1	14.5	3.4	49.0	F	2	0.20	0.41	DT Market	SM	8/4/19	4.26
KKDT0043	16.3	14.8	3.5	51.9	F	3	0.30	0.58	DT Market	SM	8/4/19	4.23
KKDT0044	16.3	14.5	3.6	54.0	F	3	0.50	0.93	DT Market	SM	8/4/19	4.03
KKDT0045	15.5	14.0	3.5	49.0	F	5	0.20	0.41	DT Market	SM	8/4/19	4.00
KKDT0048	16.4	14.6	3.4	50.5	F	2	0.50	0.99	DT Market	SM	8/4/19	4.29
KKDT0050	16.1	14.7	3.6	55.1	F	5	0.60	1.09	DT Market	SM	8/4/19	4.08
KKDT0052	16.5	15.0	3.5	51.7	F	2	0.30	0.58	DT Market	SM	8/4/19	4.29
KKDT0055	16.4	14.6	3.5	55.8	F	4	1.50	2.69	DT Market	SM	8/4/19	4.17
KKDT0056	17.0	15.3	3.6	58.4	F	5	0.60	1.03	DT Market	SM	8/4/19	4.25
KKDT0058	16.5	15.0	3.5	55.4	F	4	0.80	1.44	DT Market	SM	8/4/19	4.29
KKDT0059	16.0	14.5	3.5	54.4	F	4	0.80	1.47	DT Market	SM	8/4/19	4.14
KKV40001	16.6	15.1	3.6	56.9	F	5	0.40	0.70	V4 Market	SM	8/4/19	4.19
KKV40002	15.9	14.2	3.3	48.1	F	5	0.20	0.42	V4 Market	SM	8/4/19	4.30
KKV40003	14.9	13.5	3.3	41.7	F	1	0.00	0.00	V4 Market	SM	8/4/19	4.09
KKV40004	16.1	14.5	3.5	49.8	F	5	0.30	0.60	V4 Market	SM	8/4/19	4.14
KKV40007	16.2	15.0	3.6	51.1	F	1	0.30	0.59	V4 Market	SM	8/4/19	4.17
KKV40008	16.2	14.9	3.6	52.3	F	4	1.80	3.44	V4 Market	SM	8/4/19	4.14

No.	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD ¹
KKV40009	16.5	14.9	3.6	53.8	F	4	1.80	3.35	V4 Market	SM	8/4/19	4.14
KKV40010	16.2	14.3	3.4	51.8	F	2	0.10	0.19	V4 Market	SM	8/4/19	4.21
KKV40011	16.9	15.1	3.6	54.9	F	5	0.30	0.55	V4 Market	SM	8/4/19	4.19
KKV40014	17.0	15.1	3.6	58.2	F	4	1.40	2.41	V4 Market	SM	8/4/19	4.19
KKV40015	16.8	14.7	3.5	54.8	F	3	1.20	2.19	V4 Market	SM	8/4/19	4.20
KKV40016	16.1	14.4	3.6	50.4	F	4	1.20	2.38	V4 Market	SM	8/4/19	4.00
KKV40018	16.5	14.8	3.6	52.1	F	3	0.40	0.77	V4 Market	SM	8/4/19	4.11
KKV40019	16.4	14.9	3.7	54.4	F	5	0.30	0.55	V4 Market	SM	8/4/19	4.03
KKV40020	16.4	14.9	3.6	52.4	F	4	0.90	1.72	V4 Market	SM	8/4/19	4.14
KKV40021	16.5	14.9	3.6	51.3	F	4	0.50	0.97	V4 Market	SM	8/4/19	4.14
KKV40023	16.2	14.5	3.5	54.2	F	3	0.60	1.11	V4 Market	SM	8/4/19	4.14
KKV40024	16.5	14.6	3.7	54.7	F	4	0.90	1.65	V4 Market	SM	8/4/19	3.95
KKV40025	16.1	14.4	3.6	52.7	F	4	1.50	2.85	V4 Market	SM	8/4/19	4.00
KKV40026	16.6	15.1	3.7	56.3	F	3	1.70	3.02	V4 Market	SM	8/4/19	4.08
KKV40027	16.6	15.1	3.7	56.4	F	5	0.40	0.71	V4 Market	SM	8/4/19	4.08
KKV40028	16.0	14.6	3.4	47.5	F	3	0.80	1.68	V4 Market	SM	8/4/19	4.29
KKV40030	16.2	14.9	3.5	54.9	F	2	0.30	0.55	V4 Market	SM	8/4/19	4.26
KKV40031	16.2	14.9	3.6	55.8	F	4	0.70	1.25	V4 Market	SM	8/4/19	4.14
KKV40034	15.3	13.9	3.4	47.0	F	5	0.00	0.00	V4 Market	SM	8/4/19	4.09
KKV40035	15.7	14.1	3.3	46.2	F	5	0.30	0.65	V4 Market	SM	8/4/19	4.27
KKV40036	16.2	14.4	3.4	48.9	F	2	0.20	0.41	V4 Market	SM	8/4/19	4.24
KKV40037	15.0	13.5	3.2	38.8	F	1	0.00	0.00	V4 Market	SM	8/4/19	4.22
KKV40039	16.2	14.5	3.6	55.4	F	4	1.80	3.25	V4 Market	SM	8/4/19	4.03
KKV40040	14.9	13.4	3.2	39.9	F	1	0.00	0.00	V4 Market	SM	8/4/19	4.19
KKV40041	15.5	14.0	3.3	47.0	F	1	0.00	0.00	V4 Market	SM	8/4/19	4.24
KKDT0003	17.1	15.6	3.8	60.3	M	1	0.00	0.00	DT Market	SM	8/4/19	4.11
KKDT0007	16.1	14.6	3.7	53.8	M	5	0.40	0.74	DT Market	SM	8/4/19	3.95
KKDT0008	16.0	14.1	3.5	47.8	M	5	0.40	0.84	DT Market	SM	8/4/19	4.03

No.	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD ¹
KKDT0009	16.1	14.4	3.7	49.6	M	1	0.00	0.00	DT Market	SM	8/4/19	3.89
KKDT0030	16.0	14.3	3.5	45.0	M	5	0.30	0.67	DT Market	SM	8/4/19	4.09
KKDT0036	15.6	14.1	3.4	46.8	M	3	0.30	0.64	DT Market	SM	8/4/19	4.15
KKDT0041	15.3	14.2	3.5	48.7	M	4	0.40	0.82	DT Market	SM	8/4/19	4.06
KKDT0054	16.0	14.5	3.5	51.5	M	2	0.10	0.19	DT Market	SM	8/4/19	4.14
KKV40013	16.1	14.6	3.5	42.6	M	1	0.00	0.00	V4 Market	SM	8/4/19	4.17
KKV40017	16.9	15.0	3.5	53.7	M	5	0.00	0.00	V4 Market	SM	8/4/19	4.29
KKV40022	16.4	14.7	3.5	52.1	M	1	0.00	0.00	V4 Market	SM	8/4/19	4.20