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

REPORT

TECHNICAL TRAINING PROGRAM ON BIOLOGICAL STUDIES OF SHORT MACKEREL

KOH KONG, CAMBODIA
12-14 FEBRUARY 2019

Prepared by
FISHERIES ADMINISTRATION, CAMBODIA

SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
TRAINING DEPARTMENT

Southeast Asian Fisheries Development Center | **United Nations Environment** | **Global Environment Facility**

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1. Training Workshop Opening Session

1) The Technical Training on Biological Studies of Short Mackerel in Koh Kong was organized by PCU/SEAFDEC collaborating with Fisheries Administration of Cambodia on 12 to 14 February 2019 funded by SEAFDEC/UNEP/GEF Fisheries *Refugia*. The workshop was conducted at Koh Kong Fisheries Administration Cantonment and attended by PCU/SEAFDEC, Fisheries Administration, and Fisheries Administration Cantonment in Koh Kong, Kampot, Kep, and Preah Sihanouk, which were 13 total participants. (See annex 1, 2, and 3**)**.
2) Mr. Ith Seang Sovimol, Vice chief of Koh Kong FiAC expressed thanks for participants from SEAFDEC, FiA, and FiAC in Kep, Kampot, and Preh Sihanouk, providing us opportunity to see and attend that technical training. That training is really important for us linking to our current working. Finally, I wish that research works and training course to get successful.
3) Mr. Weerasak Yingyuad, Technical Coordinator Unit from PUC/SEAFDEC, expressed thanks very much for participants from PCU/SEAFDEC, FiA and FIAC in Koh Kong, Kep, Kampot, and Preh Sihanouk. Today, I have an honor coming to attend the technical training in Koh Kong and I would like to share my knowledge and experiences to participants from FiA and FiAC at coastal provinces, which are provinces rich of marine fisheries resource and local people depending on fishing, especially mackerel fishing in Koh Kong.
4) He added that the site selection in Koh Kong to create Indo-pacific mackerel fisheries *refugia* is resilient project in South East Asia because the project helped support policy makers to prepare fisheries resource management plan. Regarding the concept of fisheries *refugia*, it is a critical fish lifecycle, which is important data and information for management planers in order to ensure sustainable fisheries resource management.
5) He continued that short mackerel is advantage for local people, providing protein and income, however the information of short mackerel related to science is not clear yet. In this regard, FiA collaborated with SEAFDEC to do a research of short mackerel focusing on biological studies and its morphology. This information is so important to enhance the capacity to FiA and FiAC officers. Finally, he thanked very much for preparation of the technical training for the period of 3days and wished the training successful.
6) Mr. Leng Sy Vann, Deputy Director of Department of Fisheries Conservation, on behalf of FiA, especially Mr. Ouk Vibol-Director of Department of Fisheries Conservation thanks for FiAC in Kep, Kampot, Koh Kong, and Preh Sihanouk, attending the technical training in Koh Kong. I would like to take this opportunity to expressed thanks to PUC/SEAFDEC, especially Mr. Weerasak Yingyuad and Dr. Somboon Siriraksophon, Director of Regional Fisheries *Refugia* Project, supporting budgets to prepare the technical training on biological studies of short mackerel in Koh Kong. He added that the technical training in Koh Kong had been funded by SEAFDEC/UNEP/GEF Fisheries *Refugia.*
7) He continued that the training course is important for FiA and FiAC officers to get more knowledge related to biological studies, morphology, specie identification, and the identification of sample fish larvae collection. So, he suggested participants from FiACs to pay attention for studies and use knowledge from the training for working.
8) That knowledge is used for the research doing on the baseline survey of short mackerel in Koh Kong collaborating with PCU/SEAFDEC for the period of one year starting from January 2019 to January 2020. Finally, He expressed thanks again for PUC/SEAFDEC, providing the technical training course and budget and wish the training workshop get successful. And then, he declared to open the training workshop from now.

2. Observe and Collect Fish Samplings at Local Fish Market

9) Teamwork from FiA, FiAC, and PCU/SEAFDEC went down to visit Village 4 market, Dorng Tung market, and Bak Khlorng market led and facilitated by FiAC in Koh Kong and FiA. The teamwork from PUC/SEAFDEC interviewed fish sellers there in order to want to know whether where those fish were caught from. Generally, those sellers were hard to inform about that

question because they mostly bought fish from fishers or fish traders and did not asked about the information of fishing ground, so they did not know clearly about the source of its fishing ground. And then, the teamwork from FiA bought 5kg of fish at Village 4 and Dorng Tung market for practical work at class room to monitor its gonad and to keep DNA (see Annex 5).

3. Self-Introduction of All Participants

10) Participants from FiA, FiAC, SEAFDEC/PCU, and Special Lecturer introduced to the training workshop in order to understand the role, responsibility, and skill working at FiAC and FiA currently (see annex 1).

4. Provide Lecture at Class

11) Dr. Kornrawee Aiemsomboon and Ms. Parinthon Veerapattananon are facilitators, providing lecture to participants on Biology of Short Mackerel and Introduction of Morphological Study, Morphological studies, species identification, length-weigh relationship, maturity stage identification, and stomach content.
12) Dr. Kornrawee Aiemsomboon lectured Biology of Short Mackerel and Introduction of Morphological Study, Morphological studies, presenting (1) Biology of short mackerel-diagnostic characters and habitat and fisheries; (2) Species identification; (3) Morphological study; (4) Maturity stage identification; and (5) Stomach content.
13) She continued to provide her lecturing related to sampling methodology and procedure for plankton, larvae and juvenile fish by zooplankton net. Her presentation focused on zooplankton collection methodology and fish larvae collection.
14) And after that Ms. Parinthon Veerapattananon provided lecture on the key to identify the species of Scombridae. That is important lecture for participants to understand species identification, especially identification of short and long mackerel. Based on the key, it is known that body depth at posterior of opercular 3.7 to 4.3 times in fork length, it is *Rastrelliger Brachysoma*, but opercular 4.3 to 5.2 times in fork length, it is *Rastrelliger Kanagurta.*
15) Mr. Weerasak Yingyuad provided lecture on drone operators and practice how to fly a drone. His presentation focused on the concept of drone application and how to fly a drone, which is basic knowledge to apply a drone. He continued to practice how to fly a drone at field; allowing participants to enable know and understand flying a drone.

5. Technical Practices at Sea

16) On 13 February 2019, teamwork practiced at sea led and facilitated by PCU/SEAFDEC, instructing how to record and collect sample and procedures for plankton, larval and juvenile fish by zooplankton net. The teamwork visited at Peam Krasob site that is located at Peam Krasob commune, Mondol Sema district, Koh Kong province. The teamwork from PUC/SEAFDEC showed some materials to collect plankton and zooplankton such as bongo net with the mesh size of 300-315micron, salinity, water depth, Alcohol, plastic tank, small plastic tubes, labels. Teamwork from PUC/SEAFDEC added that the collection of the sample of plankton and zooplankton were made in two times/station.
17) Before starting plankton and zooplankton collection, the PUC/SEAFDEC checked salinity and water deep by using equipment from PCU/SEAFDEC and then started collecting phytoplankton and zooplankton by using the material of phytoplankton and zooplankton net
18) At the same day, teamwork visited station number 2 at Koh Kapi with the water depth of 6m and salinity of 28ppt; station number 4 with the water depth of 11m and salinity of 27ppt; station number 1 at Peam Krasob with the water depth of 4m and salinity of 26ppt, and station number 7 with the water depth of 1.6m and salinity of 27ppt (see annex 3).
19) On 14 February 2019, the teamwork visited to collect the sample of plankton and zooplankton at station number 3 and 5 at Koh Yor near Thailand border. Before starting collection, the

teamwork checked the water depth of 7m and the salinity of 28ppt at station number 3 and the water depth of 10m and salinity of 28ppt at station number 5 (see annex 3).

6. Data Analysis for Species Identification

20) The teamwork from PCU/SEAFDEC instructed to observe and check data from field/samplings through microscope such as the identification of plankton and zooplankton species and fish egg.

7. Closing the Training Workshop

21) Mr. Leng Sy Vann, on behalf of FiA, especially Mr. Ouk Vibol, Director of Department of Fisheries Conservation thanked very much for PUC/SEAFDEC again, especially Dr. Somboon Siriraksophon, Regional Project Director supporting budget to prepare the technical training on biological studies on the morphology and identification of short mackerel and sample larvae collection. Moreover, he thanked deeply to SEAFDEC/PCU for supporting a DRONE to DFC/FiA to conduct a research and data collection related to sea grass, coral reef, and socio-economic aspect. Regarding larvae collection, FiA has skill person from Marine Fisheries Research and Development Institute to help data analysis and data base of fish larvae distribution. The meeting was closed at 5:30 pm on 14 February 2019.

ANNEX 1

List of participants attending a Technical Training on Biological Studies of Short Mackerel from 12 to 14 February 2019 in Koh Kong

Name	Sex	Title	Organization	Telephone
1. Leng Sy Vann	M	Deputy Director	DFC/FiA	017446373
2. Heng Samay	M	Vice chief of Monitoring and Evaluation Division	Department of Plan, Financial, Accounting, and International Cooperation/FiA	012636370
3. Ly Kunthy	M	Vice chief of Socio-economic Division	MaFReDI/FiA	081811644
4. Rous Saret	M	Officer	DFC/FiA	011664696
5. Lang Kiri	M	Director	Koh Kong FiAC	012683377
6. Nou Ngoy	M	Vice chief of Fisheries Administration Division	Koh kong FiAC	016933192
7. Ith Seang Sovimol	M	Vice chief	Koh Kong FiAC	016276668
8. An Tha	M	Vice chief of Fisheries Administration Division	Kampot FiAC	0127057780
9. Tan Sochaly	M	Officer	Kep FiAC	098635018
10. Nhem Vanna	M	Officer	Kampongsom FiAC	077444467
11. Weerasak Yingyuad	M	Technical Coordinator Unit	SEAFDEC	(66) 0869703657
12. Dr. KornraweeAiemsomboon	F		ChulongKon University	
13. Parinthon Veerapattananon	F	Technical Officer	SEAFDEC	(66) 870619995

ANNEX 2

Agenda for Technical Training on Biological Studies of Short Mackerel (*Rastrelligerbrachysoma*) on 12-14 February 2019 in Koh Kong

DATE/TIME	TRAINING ACTIVITY/TOPIC
DAY 0:MONDAY11TH, FEBRUARY 2019	
09:00-16:00	Participants arrive at Koh Kong Province, Cambodia
16:00-18:00	Discussion with FiA staffs on preparation for the Technical Training
DAY 1: TUESDAY12TH, FEBRUARY 2019	
07:00-10:00	Observation and fish samplings at local fish market, and landing site (if appropriated)
10:30-10:40	Registration
10:40-10:50	Opening ceremony: • Welcome remark by FiAC-Koh Kong • Introduction remark by Remarks by Mr. Weerasak Yingyuad (PCU) • Opening Address by FiA Representative (Mr. Leng Sy Vann)
10:50-11:00	Self-introduction of all participants from FiA, SEAFDEC/PCU, and Special Lecturer
11:00-12:00	Lecture: Biology of Short Mackerel and Introduction of Morphological Study [by Dr. Kornrawee Aiemsomboon (Marine Science, Chulalongkorn University)]
12:00-13:00	Lunch Break
13:00-17:00	Training: Morphological studies, species identification, length-weigh relationship, maturity stage identification, and stomach content [by Dr. Kornrawee and Ms. Parinthon Veerapattananon(PCU)]
17:00-18:00	Wrap-Up and Discussion on Morphological Study (by Ms. Parinthon Veerapattananon)
19:00-21:00	Reception hosted by XXXXXXXX?
DAY 2: WEDNESDAY13TH, FEBRUARY2019	
08:00-09:00	Brief on Sampling methodology and procedures for plankton, larval and juvenile fish by zooplankton net (by Dr. Kornrawee Aiemsomboon)
09:00-14:00	At-Sea Training: plankton, larval and juvenile fish samplings in the coastal area (leg#1)
	Lunch (at the site)
14:30-15:00	Lecture: Introduction of fisheries resources research based on plankton, larval and juvenile fish sampling surveys (by Dr. Kornrawee Aiemsomboon)
15:00-17:00	Training: Identification of plankton and fish larvae related to the stomach content study in Short Mackerel (by Dr. Kornrawee Aiemsomboon and Ms. Parinthon Veerapattananon)
17:00-18:00	Wrap-Up and Discussion on Plankton and Juvenile Fish Study (by Ms. Parinthon Veerapattananon)
DAY 3: THURSDAY14TH, FEBRUARY 2019	
08:00-12:00	At-Sea Training: plankton, larval and juvenile fish samplings in the coastal area (leg#2)
12:00-13:00	Lunch (at the site)
14:00-17:00	Training for Drone Operators (by Mr. Weerasak Yingyuad)
17:00-18:00	Conclusionand Closing of The Technical Training (by Representative of FiA and SEAFDEC PCU staffs)

ANNEX 3

Flow meter was conducted during the sample collection of plankton and zooplankton on 13 to 14 February 2019 in Koh Kong

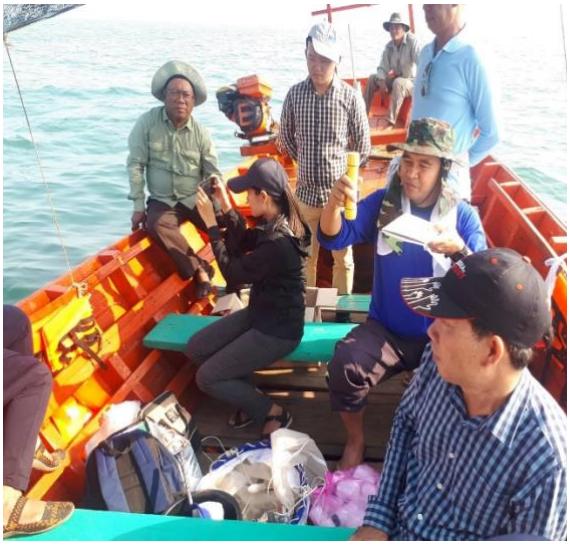
No.	Station	Sample collection of zooplankton	
		Flow meter (old number)	Flow meter (new number)
1	1	20788	1) 21139 2) 21387
2	2	19848	1) 20333 2) 20429
3	3	21664	1) 22275 2) 22351
4	4	20429	1) 20627 2) 20788
5	5	22351	1) 22491 2) 22655
6	7	21387	21679
7	• Validated flow meter after completing sample collection. • Measurement of boat length = 6m	22564 22668 22683 22698 22713 22725 22740 22755 22773 22788 22819 22842 22854 22877 22888 22912 22923 22945 22956 22981 22985 23004 23015 23013 23042 23060 23074 23092 23012	22668 22683 22698 22713 22725 22740 22755 22773 22788 22819 22820 22854 22877 22888 22912 22923 22945 22956 22981 22985 23004 23015 23031 23042 23060 23074 23092 23102 23124

ANNEX 4

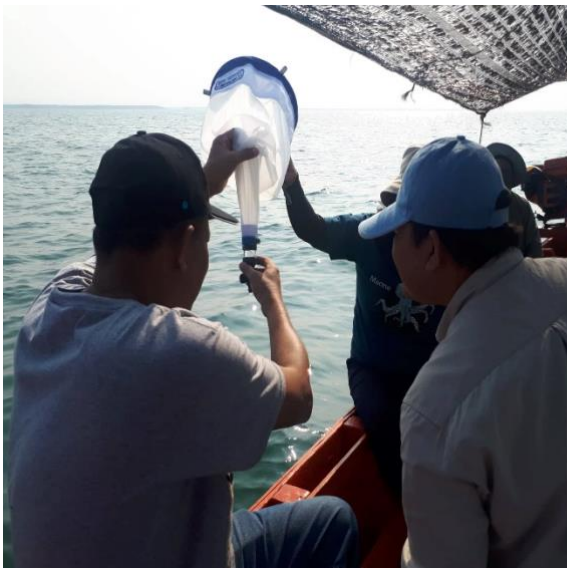
Participants' Photos in the stakeholder consultation workshop on the draft proclamation of mackerel fisheries refugia in Koh Kong from 19 to 20 December 2018 in Koh Kong province










ANNEX 5
Data of short mackerel collected from market in Koh Kong on 12 and 14 February 2019

No	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD[1]
KKDT0001	18.2	16.2	4.0	70.1	F	3	1.70	2.43	DT Market	SM	2/12/19	4.05
KKDT0002	18.1	16.6	4.0	73.4	F	2	1.10	1.50	DT Market	SM	2/12/19	4.15
KKDT0003	17.2	15.4	3.7	57.8	M	2	0.40	0.69	DT Market	SM	2/12/19	4.16
KKDT0004	15.0	13.4	3.0	35.8	ND	1	0.00	0.00	DT Market	LM	2/12/19	4.47
KKDT0005	17.5	15.3	3.9	63.8	F	2	0.80	1.25	DT Market	SM	2/12/19	3.92
KKDT0006	20.0	18.1	4.4	96.2	F	2	0.90	0.94	DT Market	SM	2/12/19	4.11
KKDT0007	16.1	14.5	3.6	52.9	F	3	0.60	1.13	DT Market	SM	2/12/19	4.03
KKDT0008	17.1	14.9	3.6	54.0	M	2	0.40	0.74	DT Market	SM	2/12/19	4.14
KKDT0009	16.2	14.9	3.5	49.1	F	2	0.30	0.61	DT Market	SM	2/12/19	4.26
KKDT0010	17.3	15.5	3.9	63.1	F	4	1.70	2.69	DT Market	SM	2/12/19	3.97
KKDT0011	17.0	15.4	3.4	54.1	M	1	0.00	0.00	DT Market	LM	2/12/19	4.53
KKDT0012	17.4	16.6	3.7	68.8	F	4	1.60	2.33	DT Market	LM	2/12/19	4.49
KKDT0013	16.1	14.5	3.7	48.5	M	1	0.00	0.00	DT Market	SM	2/12/19	3.92
KKDT0014	19.0	17.6	3.9	80.6	ND	5	0.00	0.00	DT Market	LM	2/12/19	4.51
KKDT0015	18.8	16.5	4.1	81.0	F	4	2.10	2.59	DT Market	SM	2/12/19	4.02
KKDT0016	19.1	17.0	4.2	78.3	M	5	1.00	1.28	DT Market	SM	2/12/19	4.05
KKDT0017	18.2	16.2	4.0	78.6	F	4	2.30	2.93	DT Market	SM	2/12/19	4.05
KKDT0018	18.1	16.2	3.9	71.7	F	3	1.00	1.39	DT Market	SM	2/12/19	4.15
KKDT0019	18.1	16.1	4.1	70.8	F	2	0.90	1.27	DT Market	SM	2/12/19	3.93
KKDT0020	17.8	15.9	3.7	62.3	M	5	0.80	1.28	DT Market	SM	2/12/19	4.30
KKDT0021	18.0	16.2	4.0	66.1	F	2	0.80	1.21	DT Market	SM	2/12/19	4.05
KKDT0022	17.9	16.0	3.8	66.2	M	5	1.50	2.27	DT Market	SM	2/12/19	4.21

[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]
KKDT0023	15.5	14.1	3.4	44.2	F	1	0.00	0.00	DT Market	SM	2/12/19	4.15
KKDT0024	17.0	15.3	3.8	60.2	F	4	2.00	3.32	DT Market	SM	2/12/19	4.03
KKDT0025	15.9	14.1	3.5	46.3	M	2	0.30	0.65	DT Market	SM	2/12/19	4.03
KKDT0026	17.1	15.3	3.7	55.0	M	3	0.70	1.27	DT Market	SM	2/12/19	4.14
KKDT0027	17.6	15.9	3.8	60.1	M	5	1.00	1.66	DT Market	SM	2/12/19	4.18
KKDT0028	16.4	14.9	3.5	55.9	F	2	0.50	0.89	DT Market	SM	2/12/19	4.26
KKDT0029	17.1	15.5	3.9	59.4	F	3	1.30	2.19	DT Market	SM	2/12/19	3.97
KKDT0030	19.0	16.9	4.2	76.1	F	2	1.30	1.71	DT Market	SM	2/12/19	4.02
KKDT0031	15.0	13.1	3.1	36.3	M	1	0.00	0.00	DT Market	SM	2/12/19	4.23
KKDT0032	17.1	15.2	3.7	57.6	F	1	0.40	0.69	DT Market	SM	2/12/19	4.11
KKV40001	18.0	16.0	4.2	68.3	F	4	5.30	7.76	V4 Market	SM	2/12/19	3.81
KKV40002	18.0	16.0	3.8	68.0	F	5	1.80	2.65	V4 Market	SM	2/12/19	4.26
KKV40003	18.0	16.0	3.7	74.6	M	5	0.00	0.00	V4 Market	SM	2/12/19	4.38
KKV40004	18.0	17.0	3.8	76.7	F	5	0.00	0.00	V4 Market	LM	2/12/19	4.53
KKV40005	18.0	17.0	3.5	75.4	F	5	0.00	0.00	V4 Market	LM	2/12/19	4.83
KKV40006	17.0	16.0	3.6	72.3	F	5	0.00	0.00	V4 Market	LM	2/12/19	4.48
KKV40007	16.0	14.5	3.6	51.7	M	5	0.90	1.74	V4 Market	SM	2/12/19	4.03
KKV40008	19.0	17.5	3.6	85.7	F	2	0.30	0.35	V4 Market	LM	2/12/19	4.86
KKV40009	19.0	17.5	3.9	86.5	F	2	0.00	0.00	V4 Market	LM	2/12/19	4.49
KKV40010	18.0	17.0	3.7	75.0	F	5	0.00	0.00	V4 Market	LM	2/12/19	4.59
KKV40011	19.0	17.5	4.0	87.4	F	4	4.00	4.58	V4 Market	LM	2/12/19	4.38
KKV40012	17.0	15.0	3.5	54.0	M	3	1.30	2.41	V4 Market	SM	2/12/19	4.29
KKv40013	20.0	18.0	4.0	100.7	F	2	0.00	0.00	V4 Market	LM	2/12/19	4.50
KKV40014	18.0	16.0	3.4	65.2	M	3	0.50	0.77	V4 Market	LM	2/12/19	4.71
KKV40015	18.1	16.6	3.6	64.4	M	4	0.70	1.09	V4 Market	LM	2/12/19	4.61
KKV40016	18.0	17.0	3.5	71.1	F	1	0.00	0.00	V4 Market	LM	2/12/12	4.86
KKV40017	18.2	16.9	3.6	74.1	M	1	0.00	0.00	V4 Market	LM	2/12/19	4.69
KKV40018	17.0	16.0	3.4	63.4	M	2	0.00	0.00	V4 Market	LM	2/12/19	4.71

No	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD[1]
KKV40019	19.3	17.5	4.1	83.0	F	3	1.20	1.45	V4 Market	SM	2/12/19	4.27
KKV40020	18.0	16.5	3.7	71.1	F	1	0.00	0.00	V4 Market	SM	2/12/19	4.46
KKV40021	18.2	16.2	3.9	71.8	F	4	3.40	4.74	V4 Market	SM	2/14/2019	4.15
KKV40022	17.7	16.0	3.6	62.8	F	4	1.80	2.87	V4 Market	LM	2/14/2019	4.44
KKV40023	18.2	16.2	3.9	73.0	F	4	1.50	2.05	V4 Market	SM	2/14/2019	4.15
KKV40024	17.4	15.3	3.5	63.3	F	4	1.20	1.90	V4 Market	LM	2/14/2019	4.37
KKV40025	17.9	16.0	3.8	67.9	F	4	1.50	2.21	V4 Market	SM	2/14/2019	4.21
KKV40026	18.2	16.2	4.0	74.7	M	3	1.40	1.87	V4 Market	SM	2/14/2019	4.05
KKV40027	16.2	14.4	3.5	51.1	M	3	0.60	1.17	V4 Market	SM	2/14/2019	4.11
KKV40028	17.7	15.8	3.7	64.5	F	4	1.90	2.95	V4 Market	SM	2/14/2019	4.27
KKV40029	17.0	15.3	3.7	59.3	F	4	0.90	1.52	V4 Market	SM	2/14/2019	4.14
KKV40030	16.8	15.0	3.6	53.8	F	4	1.90	3.53	V4 Market	SM	2/14/2019	4.17
KKV40031	17.8	16.0	3.8	71.5	F	4	3.10	4.34	V4 Market	SM	2/14/2019	4.21
KKV40032	18.1	16.3	4.1	70.4	F	4	2.50	3.55	V4 Market	SM	2/14/2019	3.98
KKV40033	18.6	16.3	4.0	74.7	F	5	0.10	0.13	V4 Market	SM	2/14/2019	4.08
KKV40034	17.6	15.9	3.8	66.1	F	3	1.20	1.82	V4 Market	SM	2/14/2019	4.18
KKV40035	16.9	15.1	3.8	61.9	F	5	0.60	0.97	V4 Market	SM	2/14/2019	3.97
KKV40036	17.8	16.1	3.8	69.9	F	4	2.90	4.15	V4 Market	SM	2/14/2019	4.24
KKV40037	17.5	15.3	3.8	62.0	F	5	0.90	1.45	V4 Market	SM	2/14/2019	4.03
KKV40038	18.8	16.7	4.2	80.4	F	5	1.10	1.37	V4 Market	SM	2/14/2019	3.98
KKV40039	19.0	16.8	4.2	79.7	F	5	1.00	1.25	V4 Market	SM	2/14/2019	4.00
KKV40040	18.5	16.3	3.9	72.2	F	3	1.50	2.08	V4 Market	SM	2/14/2019	4.18
KKV40041	17.1	15.3	3.7	62.0	F	4	1.70	2.74	V4 Market	SM	2/14/2019	4.14
KKV40042	17.0	15.2	3.7	59.9	F	4	1.70	2.84	V4 Market	SM	2/14/2019	4.11
KKV40043	17.0	15.2	3.6	57.6	F	3	1.10	1.91	V4 Market	SM	2/14/2019	4.22
KKV40044	19.0	17.1	4.1	81.2	F	4	2.90	3.57	V4 Market	SM	2/14/2019	4.17
KKV40045	17.5	15.9	3.9	65.6	F	5	1.40	2.13	V4 Market	SM	2/14/2019	4.08
KKV40046	17.2	15.4	3.8	62.8	F	4	0.80	1.27	V4 Market	SM	2/14/2019	4.05

No	TL	FL(cm)	BD(cm)	BW(g)	Sex	Stage	GW(g)	GSI	Area	Species	Date	FL/BD[1]
KKV40047	17.6	15.9	3.9	66.0	F	5	0.70	1.06	V4 Market	SM	2/14/2019	4.08
KKV40048	17.2	15.2	3.7	64.4	M	5	0.70	1.09	V4 Market	SM	2/14/2019	4.11
KKV40049	16.8	15.1	3.7	50.6	M	5	0.60	1.19	V4 Market	SM	2/14/2019	4.08
KKV40050	17.0	15.4	3.7	60.8	F	4	1.80	2.96	V4 Market	SM	2/14/2019	4.16
KKV40051	17.4	15.6	3.7	61.0	F	5	0.60	0.98	V4 Market	SM	2/14/2019	4.22
KKV40052	17.5	15.6	3.7	66.8	F	3	2.90	4.34	V4 Market	SM	2/14/2019	4.22
KKV40053	18.4	16.3	4.0	79.0	F	4	3.70	4.68	V4 Market	SM	2/14/2019	4.08
KKV40054	18.2	16.3	4.2	78.0	F	3	1.00	1.28	V4 Market	SM	2/14/2019	3.88
KKV40055	16.6	15.1	3.7	55.0	F	4	3.70	6.73	V4 Market	SM	2/14/2019	4.08
KKV40056	18.0	16.2	4.2	82.2	F	4	3.90	4.74	V4 Market	SM	2/14/2019	3.86
KKV40057	17.5	16.0	4.1	77.0	F	4	4.70	6.10	V4 Market	SM	2/14/2019	3.90
KKV40058	16.7	15.1	3.8	59.0	M	4	1.80	3.05	V4 Market	SM	2/14/2019	3.97
KKV40059	17.0	15.3	3.8	68.8	F	3	1.00	1.45	V4 Market	SM	2/14/2019	4.03
KKV40060	16.8	15.2	3.8	64.0	F	3	1.30	2.03	V4 Market	SM	2/14/2019	4.00
KKV40061	18.3	16.5	4.1	77.2	F	4	3.20	4.15	V4 Market	SM	2/14/2019	4.02
KKV40062	17.1	15.2	3.6	56.2	F	4	0.90	1.60	V4 Market	SM	2/14/2019	4.22
KKV40063	16.8	15.0	3.5	57.2	M	4	1.40	2.45	V4 Market	SM	2/14/2019	4.29
KKV40064	18.2	16.3	3.8	74.8	F	5	0.60	0.80	V4 Market	SM	2/14/2019	4.29
KKV40065	18.0	16.0	3.8	68.0	M	5	1.10	1.62	V4 Market	SM	2/14/2019	4.21
KKV40066	17.2	15.7	3.7	66.4	F	4	1.00	1.51	V4 Market	SM	2/14/2019	4.24
KKV40067	17.4	15.6	3.7	68.5	F	4	1.70	2.48	V4 Market	SM	2/14/2019	4.22
KKV40068	17.6	15.5	3.7	57.9	M	4	0.80	1.38	V4 Market	SM	2/14/2019	4.19
KKV40069	17.6	15.5	3.7	63.4	F	3	1.90	3.00	V4 Market	SM	2/14/2019	4.19
KKV40070	18.5	17.1	4.0	78.4	F	3	1.50	1.91	V4 Market	SM	2/14/2019	4.28
KKV40071	17.5	15.8	3.9	67.7	M	5	1.40	2.07	V4 Market	SM	2/14/2019	4.05