



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

REPORT

THE TENTH MEETING OF THAILAND'S NATIONAL FISHERIES REFUGIA COMMITTEE

BANGKOK, THAILAND
16 DECEMBER 2022

Prepared by

Department of Fisheries Thailand

SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
TRAINING DEPARTMENT



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REPORT OF THE MEETING

The tenth meeting of Thailand's National Fisheries *Refugia* Committee for the project on "Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand" was conducted by Department of Fisheries on 16th December 2022, 13.30 – 16.30 hours, at Department of Fisheries, Bangkok, concurrently connecting online via zoom platform. **Ms. Prulai Nootmorn**, acting Executive Advisor for Fisheries Management, acted for the Director-General as the chairperson in his absence. Apart from the committee members, participants also included officers from SEAFDEC and Department of Fisheries, 18 attendees in total. Meeting agenda and list of participants are shown in ANNEX 1 and ANNEX 2, respectively.

AGENDA 1 REPORT OF THE CHAIRPERSON

1.1 Ms. Prulai Nootmorn, acting Executive Advisor for Fisheries Management, as the acting chairperson, welcomed all committee members and noted that this was the final meeting of Thailand's National Fisheries *Refugia* Committee for fisheries *refugia* project. She expressed her pleasure that Thailand had done the significant progress of project implementation leading to the excellent accomplishment of Fisheries *Refugia* establishment in Thailand. In this regard, **Ms. Prulai** noted that Director-General of Department of Fisheries had suggested preparing guidelines for fisheries *refugia* establishment for the purpose of establishing the *refugia* in other sites in the country, both marine and freshwater areas.

AGENDA 2 APPROVAL OF REPORT OF THE PREVIOUS MEETING

2.1 Dr. Pavarot Noranarttragoon, Acting Senior Expert in Marine Fisheries and, concurrently, Fisheries *refugia* Project National Focal Point for Thailand, as the Committee and Secretary, informed the meeting that report of the previous meeting, namely, the Ninth Meeting of Thailand's National Fisheries *Refugia* Committee conducted on 22th March 2022, had been handed in to each committee member for consideration. In this regard, he requested the meeting to consider, amend, and approve the report, which was prepared as the attachment to the meeting document.

2.2 Meeting Resolution: The committee approved report of the Ninth Meeting of Thailand's National Fisheries *Refugia* Committee conducted on 22th March 2022.

AGENDA 3 MATTERS OF REPORT

3.1 Notification for Fisheries *Refugia* in Thailand

3.1.1 Notification for Fisheries *Refugia* at Surat Thani Site

3.1.1.1 **Dr. Pavarot Noranarttragoon** presented to the meeting the notification for fisheries *refugia* at Surat Thani Site entitled Notification of Surat Thani Provincial Fisheries Committee Re: Prohibition of Some Fishing Gears Fishing in the Fishing Ground within the Coastal Seas around the Area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province, B.E. 2565, dated 8th March B.E. 2565 (2022). The unofficial translation of such Notification is shown in ANNEX 3. Contents in the Notification are concluded as follows:

1) Fisheries *refugia* at Surat Thani Site is an area of $1.5 \times 6 = 9 \text{ km}^2$ (5,625 Thai rai) with rectangular boundary lying longitudinally northeast-southwest along the water channel, covering all sand dune area of Koh Sed (Figure 1)

2) Management measures in fisheries *refugia* is:

No person shall fish in fisheries *refugia* at Surat Thani Site by the following fishing gears:

- (1) Crab traps; and
 - (2) Crab gill nets of a mesh size less than 3 inches.
- 3) The Notification came into force as from 23rd March 2022.

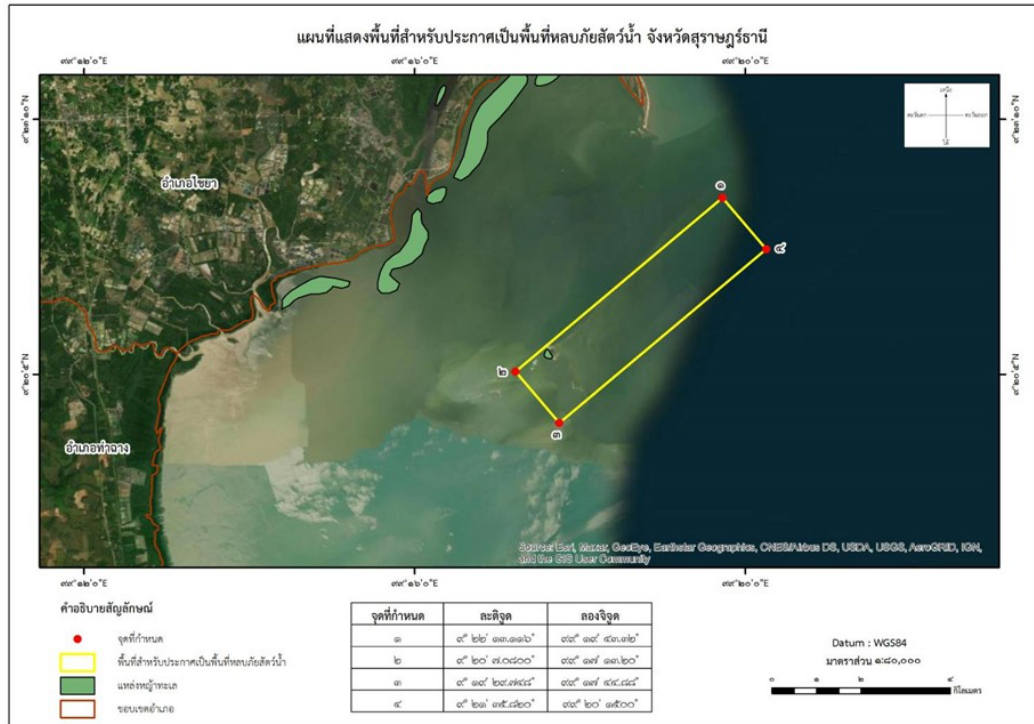


Figure 1 Fisheries refugia at Surat Thani Site, Thailand

3.1.1.2 **Ms. Prulai Nootmorn** added the information that fisheries *refugia* at Surat Thani Site was located in the area of coastal seas of the province so that management measures for the *refugia* were notified by Surat Thani Provincial Fisheries Committee, conform to Royal Ordinance on Fisheries B.E. 2558.

3.1.1.3 **Meeting Resolution:** the meeting acknowledged the notification for fisheries *refugia* at Surat Thani Site.

3.1.2 Notification for Fisheries *Refugia* at Trat Site

3.1.2.1 **Dr. Pavarot Noranarttragoon** proceeded to the presentation of the notification for fisheries *refugia* at Trat Site entitled Notification of Ministry of Agriculture and Cooperatives Re: Prescribing Fishing Gears, Fishing Methods, Fishing Areas, and Conditions Prohibited from Fishing in some Parts of the Fishing Ground in Trat Province, B.E. 2565, dated 26th May B.E. 2565 (2022). The unofficial translation of such Notification is shown in ANNEX 4. Contents in the Notification are concluded as follows:

- 1) Fisheries *refugia* at Trat Site is composed of 2 areas including:
 - (1) An area of 1,376.35 km² (860,219 Thai rai) with its boundary straight lining along Trat Coast, from Laem Ling, Bang Pit Subdistrict, Laem Ngop District in the north-west coast to 3-NM-offshore of Ban Had Lek, Had Lek Subdistrict, Khlong Yai District at the south-east border; and
 - (2) An area of 169.65 km² (106,01 Thai rai) with a 3-NM-offshore boundary lining along the east coast of Koh Kut (Figure 2).
- 2) Management measures in fisheries *refugia* is:

In the period from 1 January to 29 February every year, no person shall fish in fisheries *refugia* at Trat Site by the following fishing gears:

 - (1) Purse seines fitted to motor vessels; and
 - (2) Pair trawls fitted to motor vessels.
- 3) The Notification came into force as from 22rd June 2022.

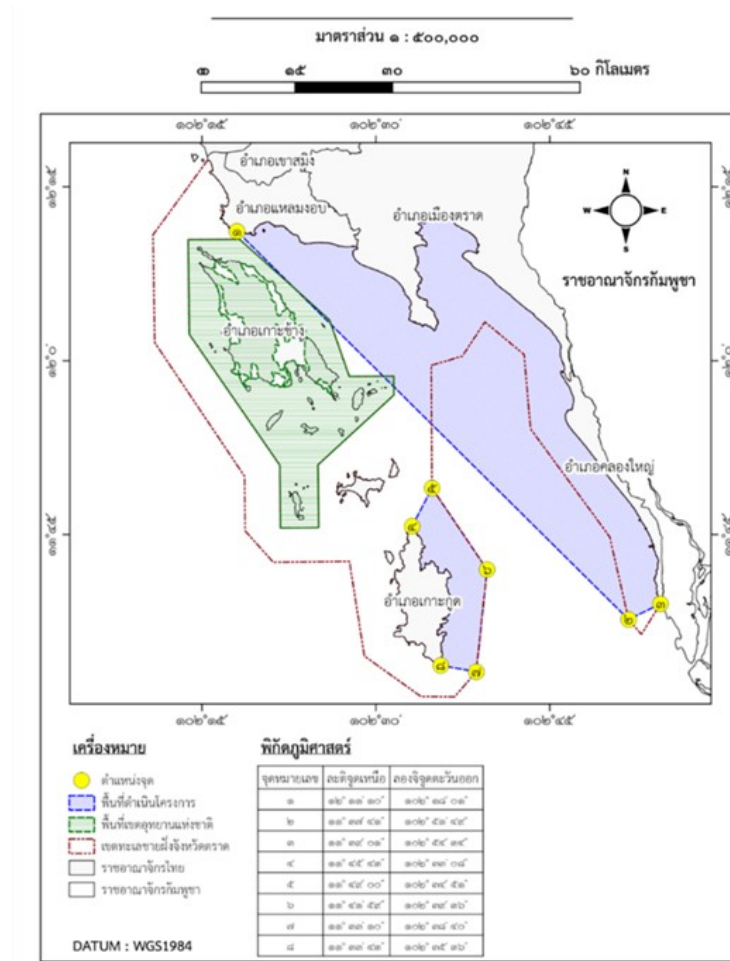


Figure 2 Fisheries refugia at Trat Site, Thailand

3.1.2.2 **Ms. Prulai Nootmorn** added the information that in case of fisheries *refugia* at Trat Site, it was located in the area of both coastal seas and offshore seas, so that management measures for the *refugia* were notified by Ministry of Agriculture and Cooperatives, conform to Royal Ordinance on Fisheries B.E. 2558.

3.1.2.3 **Meeting Resolution:** the meeting acknowledged the notification for fisheries *refugia* at Trat Site.

3.2 Implementation Activities Following the Issuance of Notification for Fisheries Refugia in Thailand

3.2.1 **Mr. Pavart Noranarttragoon** reported to the meeting the implementation activities following the issuance of notification for fisheries *refugia* in Thailand as follows:

3.2.1.1 Implementation Activities in Thailand

- 11th March 2022: Appointment of Operational Management Board for Fisheries *Refugia* at Surat Thani Site, contents of which are shown in ANNEX 5
- 26th May 2022: Appointment of Operational Management Board for Fisheries *Refugia* at Trat Site, contents of which are shown in ANNEX 6
- 30th May 2022: Organization of the workshop on fisheries *refugia* operational management planning at Surat Thani Site
- 31st May 2022: Organization of the workshop on fisheries *refugia* boundary marking at Surat Thani Site
- 2nd September 2022: Organization of the workshop on fisheries *refugia* operational management planning at Trat Site

- 3rd – 5th October 2022: Organization of the seventh meeting of Thailand’s National Scientific and Technical Committee (workshop meeting) for elaborating management plans for fisheries *refugia* at Surat Thani Site and Trat Site
- 15th November 2022: Organization of the fourth meeting of Site-based Fisheries *Refugia* Management Board in Surat Thani Province for the purpose of consideration, amendment, and adoption of management plan for fisheries *refugia* at Surat Thani Site
- 22nd November 2022: Organization of the fourth meeting of Site-based Fisheries *Refugia* Management Board in Trat Province for the purpose of consideration, amendment, and adoption of management plan for fisheries *refugia* at Trat Site

3.2.1.2 Implementation Activities at Regional Level

- 4th – 6th July 2022: Participating in the 6th Regional Scientific and Technical Committee Meeting at Southeast Asian Fisheries Development Center/ Training Department, Samut Prakan Province, Thailand
- 8th – 10th November 2022: Participating in the 7th Regional Scientific and Technical Committee Meeting at Jakarta, Indonesia

Regarding regional level, **Dr. Pavarot** additionally presented to the meeting the list of fisheries *refugia* in the South China Sea and Gulf of Thailand, established in six participating countries, which were composed of 15 *refugia* sites together with their target species, fishing closure periods, status, and habitat linkages, total area of which was 1,423,742 ha or 14,237.42 km². Details are shown in ANNEX 7

3.2.2 **Mr. Weerasak Yingyuad**, Representative of Project Coordinating Unit, SEAFDEC/UNEP/GEF/Fisheries *Refugia* Project, informed the meeting that there would be a virtual meeting of Project Steering Committee on 23rd November 2022, for which the inviting letters were being prepared by Project Coordinating Unit. He also noted that there would be a project closing event organized in the Philippines at the beginning of 2023 for the purpose of concluding the implementation activities and lesson learned from fisheries *refugia* establishment in the South China Sea and Gulf of Thailand at both national and regional level.

3.2.3 **Meeting Resolution:** the meeting acknowledged implementation activities following the issuance of notification for fisheries *refugia* in Thailand.

AGENDA 4 MATTERS FOR CONSIDERATION

4.1 Management Plan for Fisheries *Refugia* at Surat Thani Site of Thailand

4.1.1 **Mr. Akanit Kueapuek**, Senior Fisheries Technical Officer of Chumphon Marine Fisheries Research and Development Center, introduced to the meeting the management plan for fisheries *refugia* at Surat Thani Site which was developed by Operational Management Board for Fisheries *Refugia* in Surat Thani Province, elaborated by Thailand’s National Scientific and Technical Committee, and amended and adopted by Site-Based Fisheries *Refugia* Management Board in Surat Thani Province, details of which are shown in ANNEX 8. **Mr. Akanit** noted that he had rearranged the elements in each component of the plan into a new format in which objectives were listed and each of them was supported by measurement actions, key performance indicators and responsible agencies that were identified and adopted by the said committees. He explained the details of management plan for fisheries *refugia* at Surat Thani Site by objectives then requested consideration and discussion from the meeting.

4.1.2 **Ms. Praulai Nootmorn** expressed her concerns about the budget for management actions and the evaluation of the implementation of the plan.

4.1.3 **Dr. Pavarot Noranartragoon** responded that the plan should be submitted and be considered for budget allocation by Surat Thani Provincial Fisheries Committee. He noted that the budget could be allocated from the provincial budget. In case of activities conducted by Marine Fisheries Research and Development Center, the budget could be obtained from the operation budget of the Center itself.

4.1.4 **Mr. Somporn Kuasakul**, Head of Fisheries Administration and Management Group, Surat Thani Fisheries Provincial Office, noted that Surat Thani Fisheries Provincial Office would take action for submission of the plan to Surat Thani Provincial Fisheries Committee for acknowledgement. Regarding budget, he noted that the proposal for implementation project had to be prepared and proposed for approval, so that it took a certain time for budget allocation.

4.1.5 **Ms. Prulai Nootmorn** recommended that budget could be requested from municipal office, in this regard, she suggested Fisheries District Chief coordinate with Phum Rieng Subdistrict Municipality for budget allocation.

4.1.6 **Dr. Kongkiat Kittiwattanawong**, Special Expert in the Research of Resources and Environment in Marine and Coastal Ecosystem, Department of Marine and Coastal Resources, mentioned about the existence of Dugong in the area of fisheries *refugia* at Surat Thani Site. On this matter, he requested considering conservation of this endangered species together with the activity of seagrass protection in the area.

4.1.7 **Ms. Prulai Nootmorn** recommended inclusion of fisheries *refugia* at Surat Thani Site in the implementation area of the upcoming South China Sea Project in which Department of Marine and Coastal Resources was involved. She noted that this would be great advantage for integration of fisheries and environment concerns in the area.

4.1.8 **Mr. Somporn Kuasakul** mentioned that, from community consultations, it was resulted that shellfish farmers would leave their shellfish farm from seagrass bed areas. Thus, it would be good for dugongs in the area as well.

4.1.9 **Ms. Prulai Nootmorn** requested deleting the activity of “set up the poles with reflective painting for steady fisheries *refugia* boundary marking” from the management actions in objective 3 for the reason that due to the national regulation, it was much complicate to put any permanent construction into the water of Thailand.

4.1.10 **Meeting Resolution:** after amendment by deleting the activity on “set up the poles with reflective painting for steady fisheries *refugia* boundary marking” from the management action in objective 3, the meeting adopted management plan for fisheries *refugia* at Surat Thani Site of Thailand and agreed that Surat Thani Fisheries Provincial Office cooperated with relating agencies were responsible for the implementation and evaluation of the plan.

4.2 Management Plan for Fisheries *Refugia* at Trat Site of Thailand

4.2.1 **Mr. Akanit Kueapuek** proceeded to the presentation of the management plan for fisheries *refugia* at Trat Site which was developed by Operational Management Board for Fisheries *Refugia* in Trat Province, elaborated by Thailand’s National Scientific and Technical Committee, and amended and adopted by Site-Based Fisheries *Refugia* Management Board in Trat Province, details of which are shown in Annex 9. **Mr. Akanit** again noted that he had rearranged the elements in each component of the plan into a new format in which objectives were listed and each of them was supported by measurement actions, key performance indicators and responsible agencies that were identified and adopted by the said committees. He explained the details of management plan for fisheries *refugia* at Trat Site by objectives then requested consideration and discussion from the meeting.

4.2.2 **Ms. Prulai Nootmorn** recommended evaluation of the plan, same as those mentioned for the plan at Surat Thani Site.

4.2.3 **Mr. Thanich Poolthong**, Head of Fisheries Administration and Management Group, Trat Fisheries Provincial Office, noted that Trat Fisheries Provincial Office cooperated with Rayong Marine Fisheries Research and Development Center would accelerate the dissemination of the measures for fisheries *refugia* at Trat Site as it was almost reach the first time of prohibition period of short mackerel fishing, 1st January – 29th February. Nevertheless, He mentioned that Fisheries Association of Trat had already acknowledged the Notification.

4.2.4 **Mr. Thanut Srikum**, Director of Rayong Marine Fisheries Research and Development Center, informed the meeting that besides the roll-up for fisheries *refugia* information dissemination installed in the communities, the Center had been coordinating with Department of Fisheries Radio Broadcasting at Rayong to produce spot announcement for dissemination of the Notification and its measures at Trat Site.

4.2.5 **Ms. Prulai Nootmorn** recommended conducting small scale of public hearing in Trat Province for the acknowledgement of fishers and fishing communities on the Notification and its measures.

4.2.6 **Mr. Jaroonsak Petchsri**, Inspector-General for Department of Fisheries, expressed his opinion that non-compliance with the regulation at fisheries *refugia* might be rare as there were not many prohibited fishing vessels, purse seiners and pair trawlers, in Trat Province. Besides, Koh Chang Marine Fisheries Patrol Unit of Department of Fisheries could support monitoring and surveillance in the area by patrolling and by vessel monitoring system (VMS).

4.2.7 **Asst. Prof. Sansanee Wangworalak**, Head of the Department of Fisheries Management, Faculty of Fisheries, Kasetsart University, mentioned that data obtained from VMS showed that there were some pair trawlers from Samaesarn, Chol Buri Province coming to Trat Seas, so that she recommended conducting information dissemination of the notification for fisheries *refugia* throughout the eastern coast of the Gulf of Thailand.

4.2.8 **Ms. Prulai Nootmorn** recommended coordinating with Samut Prakan Marine Fisheries Research and Development Center for the matter of additional fisheries *refugia* information dissemination in the inner Gulf of Thailand.

4.2.9 The meeting was clarified that, by legal, management plan for fisheries *refugia* at Surat Thani Site and Trat Site need not to be considered and adopted by National Fisheries Committee as they were .

4.1.10 **Meeting Resolution:** the meeting adopted management plan for fisheries *refugia* at Trat Site of Thailand and agreed that Trat Fisheries Provincial Office cooperated with relating agencies were responsible for the implementation and evaluation of the plan.

4.3 **Budget Balance as at 15st December 2022 and Costed Work Plan Ending 31st December 2022**

4.3.1 **Dr. Pavarot Noranartragoon** reported to the meeting the budget balance of fisheries *refugia* project for Thailand as at 15st December 2022, concluded as follows:

Overall allocated budget was	7,368,704.92 Baht;
Total expenditure as at 15 st December 2022 was	7,296,875.40 Baht; and
Closing balance was	71,829.52 Baht.

Details of budget expenditure for each activity as at 15st December 2022 are shown in ANNEX 10

4.3.2 **Mr. Pavarot** subsequently reported the costed work plan for the period of 16th – 31st December 2022 as follows:

Closing balance as at 15 th December 2022 was	71,829.52 Baht;
Costed work plan ending 31 st December 2022 was	71,829.52 Baht; and
Closing balance as at 31 st December 2022 was	00.00 Baht.

Details of the each costed activity for the period of 16th – 31st December 2022 are shown in ANNEX 11.

4.3.3 **Ms. Prulai Nootmorn** expressed her appreciation, on behalf of Department of Fisheries, to SEAFDEC for its coordination and support of budget allocation and transfer for the project implementation in Thailand.

4.3.4 **Meeting Resolution:** the meeting adopted budget balance as at 15st December 2022 and costed work Plan ending 31st December 2022.

AGENDA 5 **ANY OTHER BUSINESS**

5.1 **Ms. Jinda Petchkamnerd**, Director of Chumphon Marine Fisheries Research and Development Center, informed the meeting that Chumphon Marine Fisheries Research and

Development Center and Rayong Marine Fisheries Research and Development Center, in cooperation with Information Technology Center of Department of Fisheries and in consultation with Senior Expert in Spatial Fisheries of Department of Fisheries, were conducting outreach program at the locations of fisheries *refugia* by developing research projects on spatial database around fisheries *refugia* sites in Surat Thani Province and Trat Province. She noted that such projects had been prepared to request funding from Thailand Research Fund.

5.2 Dr. Pavarot Noranarttragoon inquired about the transfer of asset belonged to the project which were placed at the Department of Fisheries of Thailand

5.3 Mr. Weerasak Yingyuad responded that the matter of asset transfer would be discussed in the upcoming Project Steering Committee Meeting on 23rd December 2022.

5.4 Ms. Prulai Nootmorn recommended preparing regional guidelines for establishment and operation of fisheries *refugia* in the region and different lesson learned from each participating country. She expressed her appreciation on the accomplishment of the project implementation by Department of Fisheries of Thailand with cooperation of SEAFDEC and UN environment. In this regard, she recommended Marine Fisheries Research and Development Division applying fisheries *refugia* project for the Public Sector Excellence Awards.

5.5 Dr. Pavarot Noranarttragoon, on behalf of Marine Fisheries Research and Development Division, acknowledged the recommendation on applying the project for the Awards and would bring it into consideration and action.

5.6 Mr. Weerasak Yingyuad took the opportunity, on behalf of SEAFDEC, to express appreciation to Department of Fisheries, Department of Marine and Coastal Resources, and Faculty of Fisheries of Kasetsart University, including Director-General of Department of Fisheries, Executive Advisor for Fisheries Management, Director of Marine Fisheries Research and Development Division, Directors of Chumphon Marine Fisheries Research and Development Center and Rayong Marine Fisheries Research and Development Center, and Directors of Surat Thani Provincial Fisheries Office and Trat Provincial Fisheries Office for their great cooperation leading to the success of project implementation in Thailand. He also expressed his hope that this would be best practice for establishing the *refugia* in other areas of the country.

5.7 Ms. Prulai Nootmorn ended the meeting by thanking the committee for their cooperation and concerns.

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ANNEX 1

AGENDA

- AGENDA 1** **REPORT OF THE CHAIRPERSON**

- AGENDA 2** **APPROVAL OF REPORT OF THE PREVIOUS MEETING**

- AGENDA 3** **MATTERS OF REPORT**
 - 3.1 Notification for Fisheries *Refugia* in Thailand**
 - 3.1.1 Notification for Fisheries *Refugia* at Surat Thani Site
 - 3.1.1 Notification for Fisheries *Refugia* at Trat Site

 - 3.2 Implementation Activities Following the Issuance of Notification for Fisheries *Refugia* in Thailand**

- AGENDA 4** **MATTERS FOR CONSIDERATION**
 - 4.1 Management Plan for Fisheries *Refugia* at Surat Thani Site of Thailand**
 - 4.2 Management Plan for Fisheries *Refugia* at Trat Site of Thailand**
 - 4.3 Budget Balance as at 15st December 2022 and Costed Work Plan Ending 31st December 2022**

- AGENDA 5** **ANY OTHER BUSINESS**

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ANNEX 2

LIST OF PARTICIPANTS

Thailand's National Fisheries Refugia Committee

1.	Ms. Prulai Nootmorn	Acting Executive Advisor for Fisheries Management, Department of Fisheries	Acting-Chairperson
2.	Cdr. Pornchai Singhaboon	Senior Expert in Fishing Gear, Marine Fisheries Research and Development Division, Department of Fisheries (Represented Division Director)	Vice-Chairperson
3.	Mr. Weerasak Yingyuad	Representative of Project Coordinating Unit, SEAFDEC/UNEP/GEF/Fisheries <i>Refugia</i> Project	Consultant
4.	Asst. Prof. Sansanee Wangworalak, Ph.D. (Ms.)	Head of the Department of Fisheries Management, Faculty of Fisheries, Kasetsart University (represented Dean)	Committee
5.	Mr. Jaroonsak Petchsri	Inspector-General, Department of Fisheries (represented Inspector-General Head)	Committee
6.	Ms. Jutarat Kittiwanch	Senior Fisheries Technical Officer, Coastal Aquaculture Research and Development Division, Department of Fisheries (represented Division Director)	Committee
7.	Mr. Supasit Boonphanphol	Senior Fisheries Technical Officer, Marine and Coastal Resources Research and Development Institute, Department of Marine and Coastal Resources (Represented Institute Director)	Committee
8.	Mr. Kongkiat Kittiwattanawong, Ph.D.	Special Expert in the Research of Resources and Environment in Marine and Coastal Ecosystem, Department of Marine and Coastal Resources	Committee
9.	Mr. Thanich Poolthong	Head of Fisheries Administration and Management Group, Trat Fisheries Provincial Office, Department of Fisheries (Represented Office Director)	Committee
10.	Mr. Somporn Kuasakul	Head of Fisheries Administration and Management Group, Surat Thani Fisheries Provincial Office, Department of Fisheries (Represented Office Director)	Committee
11.	Mr. Pavarot Noranarttragoon, Ph.D.	Acting Senior Expert in Marine Fisheries, Department of Fisheries	Committee and Secretary
12.	Mr. Thanut Srikum	Director, Rayong Marine Fisheries Research and Development Center, Department of Fisheries	Committee and Assistant Secretary
13.	Ms. Jinda Petchkamnerd	Director, Chumphon Marine Fisheries Research and Development Center, Department of Fisheries	Committee and Assistant Secretary

Invited Presentator

1.	Mr. Akanit Kueapuek	Senior Fisheries Technical Officer, Chumphon Marine Fisheries
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Research and Development Center, Department of Fisheries

Observers

1. Mr. Nopporn Manajit, Ph.D. Marine Fisheries Senior Researcher, Southeast Asian Fisheries Development Center/ Training Department
2. Ms. Ratana Munprasit Assistant for Fisheries *Refugia* Project, Department of Fisheries
3. Ms. Panita Choopan Fisheries *Refugia* Project Officer, Department of Fisheries
4. Ms. Nattha Chalomklang Fisheries *Refugia* Project Officer, Department of Fisheries

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ANNEX 3

(Unofficial Translation)

Notification of Surat Thani Provincial Fisheries Committee
Re: Prohibition of Some Fishing Gears Fishing in the Fishing Ground within the Coastal Seas
around the Area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province
B.E. 2565

Whereas the fishing ground in the coastal seas around the area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province is a place of biodiversity and rich of aquatic animal resources and ecosystem as well as seagrass bed which is a significant place for inhabiting, taking refuge, breeding, spawning, and larval rearing of aquatic animals, particularly young blue swimming crabs. At present, however, it appears that some fishing gears inappropriate for young blue swimming crabs are used for fishing in such area. If fishing by such fishing gears continues, it will cause catching a large number of premature blue swimming crabs which will affect the abundance of blue swimming crab resources in the area. Thus, to control fishing so as not to degrade the sustainability of blue swimming crab resources and to conserve seagrass ecosystem for serving as the fisheries refugia for young aquatic animals, it is expedient to impose conservation and management measures aiming at balancing the nature and maintaining sustainability of aquatic animal resources and ecosystem on the basis of precautionary principle.

By virtue of the provisions of Section 28, first paragraph (3) appurtenant to Section 71, first paragraph (1) of the Royal Ordinance on Fisheries B.E. 2558 (2015), Surat Thani Provincial Fisheries Committee, with the approval of the Minister of Agriculture and Cooperatives, hereby issues the Notification as follows:

Clause 1 No person shall use the following fishing gears fishing in the fishing ground within the coastal seas around the area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province, the boundary of which appears on the map attached to this Notification:

- (1) Crab traps; and
- (2) Crab gill nets of a mesh size less than 3 inches.

Clause 2 This Notification shall come into force as from the day following date of its publication in the Government Gazette.

Notified on 8th March B.E. 2565 (2022)

Signed Witchawut Chinto

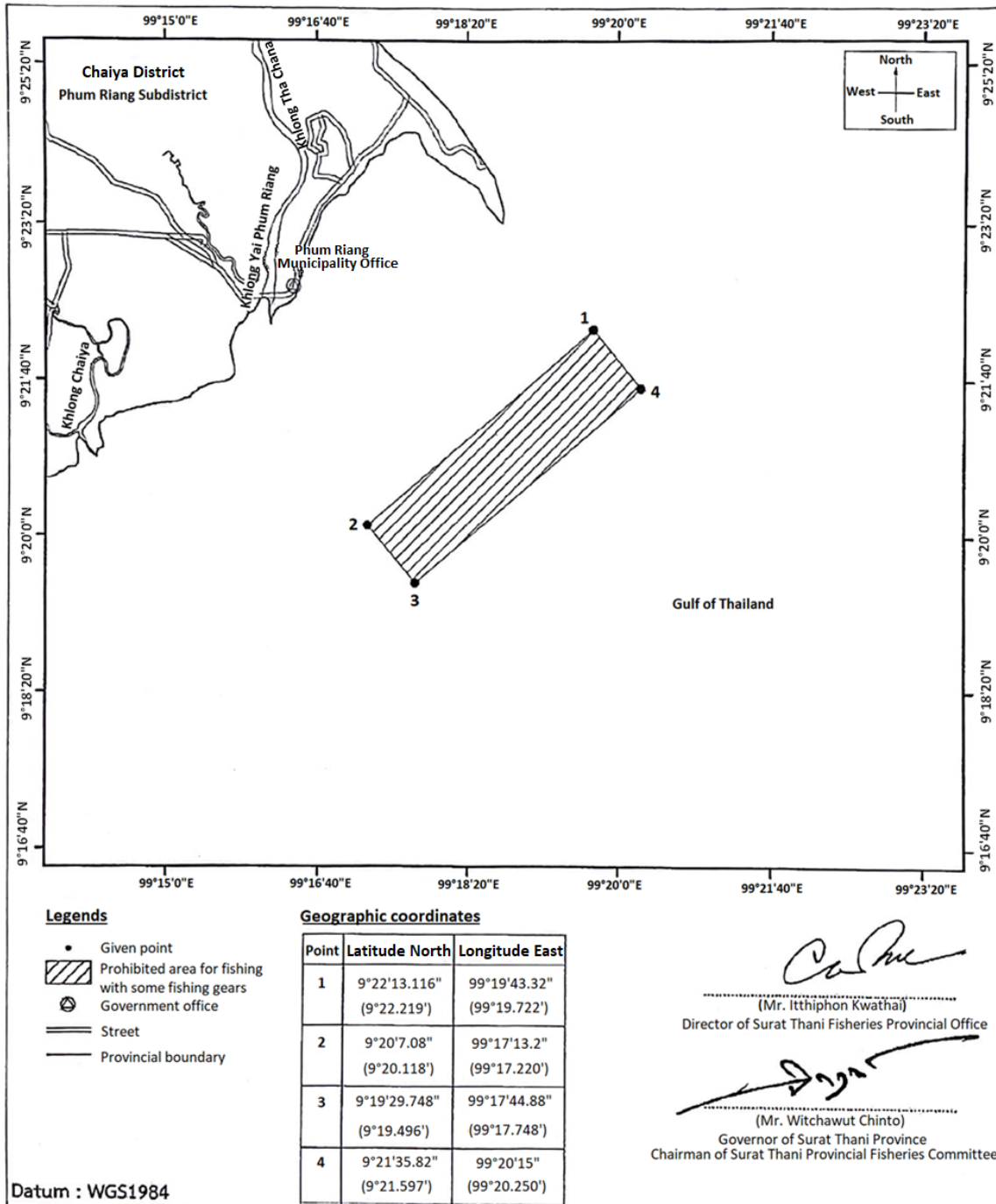
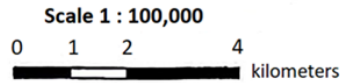
(Mr. Witchawut Chinto)

Governor of Surat Thani Province

Chairman of Surat Thani Provincial Fisheries Committee

(Unofficial Translation)

**Map attached to Notification of Surat Thani Provincial Fisheries Committee
 Re: Prohibition of Some Fishing Gears Fishing in the Fishing Ground within the Coastal Seas
 around the Area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province
 B.E. 2565**



ANNEX 4

(Unofficial Translation)

Notification of Ministry of Agriculture and Cooperatives**Re: Prescribing Fishing Gears, Fishing Methods, Fishing Areas, and Conditions Prohibited from Fishing
in some Parts of the Fishing Ground in Trat Province
B.E. 2565**

Whereas some parts of the fishing ground in Trat Province are places of abundant aquatic animal resources, rich ecosystem, and significant fishing grounds, as well as a migration route for short mackerel population. It is found that particularly in the period from January to February every year, a large number of fully mature short mackerel migrate into the areas for inhabiting, taking refuge, and breeding. At present, however, it appears that some inappropriate fishing gears are used for fishing in such areas. If fishing by such fishing gears continues, it will cause catching a great quantity of short mackerel which affect the abundance of short mackerel resources. Thus, to control fishing so as not to degrade the sustainability of aquatic animal resources, particularly to prevent excess catch of short mackerel breeders which will result in enhancing their opportunity of spawning and propagation so that they can maintain their status as food sources for people and fisheries resources for sustainable fishing, it is expedient to impose conservation and management measures aiming at balancing the nature and maintaining sustainability of aquatic animal resources and ecosystem on the basis of precautionary principle.

By virtue of the provisions of Section 71, first paragraph (1) of the Royal Ordinance on Fisheries B.E. 2558 (2015), the Minister of Agriculture and Cooperatives hereby issues the Notification as follows:

Clause 1 In the period from 1 January to 29 February every year, no person shall fish in some parts of the fishing ground in Trat Province by the following fishing gears:

- (1) Purse seines fitted to motor vessels; and
- (2) Pair trawls fitted to motor vessels.

The boundaries of such areas appear on the map attached to this Notification.

Clause 2 This Notification shall come into force as from the day following date of its publication in the Government Gazette.

Notified on 26th May B.E. 2565 (2022)

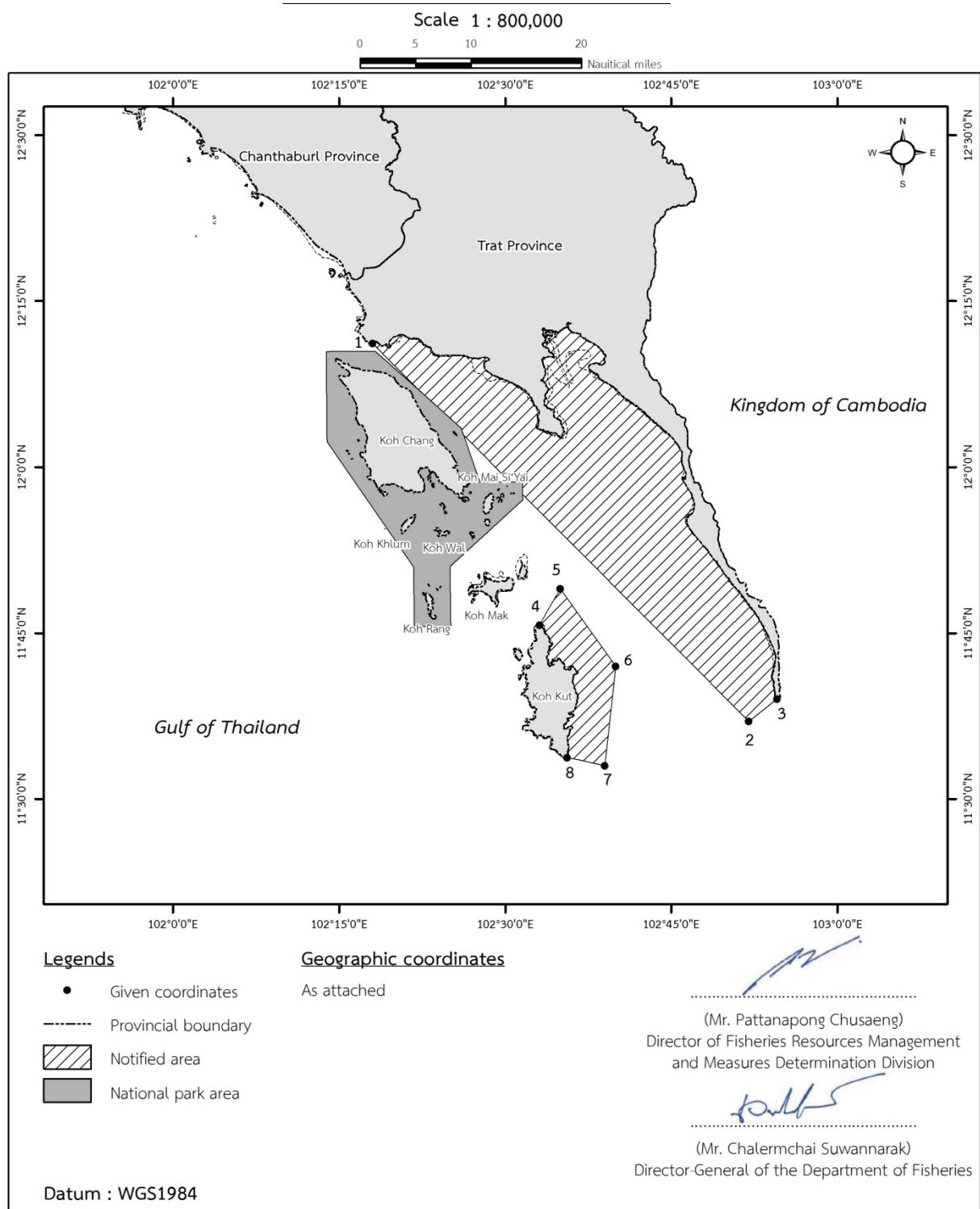
Signed Chalermchai Srion

(Mr. Chalermchai Srion)

Minister of Agriculture and Cooperatives

(Unofficial Translation)

**Map attached to Notification of Ministry of Agriculture and Cooperatives
Re: Prescribing Fishing Gears, Fishing Methods, Fishing Areas, and Conditions Prohibited from Fishing
in some Parts of the Fishing Ground in Trat Province
B.E. 2565**



(Unofficial Translation)

Geographic coordinates for boundaries of the areas in some parts of the fishing ground in Trat Province prohibited from fishing by purse seines and pair trawls fitted to motor vessels

Point	Latitude North	Longitude East
1	12° 11' 10.1040" (12° 11.168')	102° 18' 01.1880" (102° 18.020')
2	11° 37' 00.0000" (11° 37.000')	102° 52' 00.0000" (102° 52.000')
3	11° 39' 01.4040" (11° 39.023')	102° 54' 33.5520" (102° 54.559')
4	11° 45' 43.0920" (11° 45.718')	102° 33' 08.2080" (102° 33.137')
5	11° 49' 00.0000" (11° 49.000')	102° 35' 00.0000" (102° 35.000')
6	11° 42' 00.0000" (11° 42.000')	102° 40' 00.0000" (102° 40.000')
7	11° 33' 00.0000" (11° 33.000')	102° 39' 00.0000" (102° 39.000')
8	11° 33' 42.9480" (11° 33.716')	102° 35' 36.2760" (102° 35.605')

ANNEX 5

(Unofficial Translation)

**Notification of Surat Thani Province
No. 1963/2565****Re: Appointment of Operational Management Board for Fisheries *Refugia* in the Coastal Seas
around the Area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province**

According to the mutual agreement of the Department of Fisheries and stakeholders in Ban Don Bay of Surat Thani Province on the establishment of fisheries *refugia*, particularly for young blue swimming crabs, at the area of 5,625 rai in the fishing ground within the coastal seas around the area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province, pursuant to Notification of Surat Thani Provincial Fisheries Committee Re: Prohibition of Some Fishing Gears Fishing in the Fishing Ground within the Coastal Seas around the Area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province, B.E. 2565, dated 8th March B.E. 2565 (2022);

In order for effectively operational management and the achievement of being a fisheries *refugia*, Operational Management Board for Fisheries *Refugia* in the Coastal Seas around the Area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province shall be appointed, comprising the following members:

- | | |
|--|------------------|
| 1. Mayor of Phum Riang Subdistrict, Chaiya District | Chairperson |
| 2. Li Let Subdistrict Head, Phun Phin District | Vice-Chairperson |
| 3. Mayor of Takrop Subdistrict, Chaiya District | Committee |
| 4. Mayor of Lamed Subdistrict, Chaiya District | Committee |
| 5. Takrop Subdistrict Head, Chaiya District | Committee |
| 6. Lamed Subdistrict Head, Chaiya District | Committee |
| 7. Chairperson of the Local Fishing Community Organization of Aquatic Animal Resources Management Group for Sustainable Community | Committee |
| 8. Chairperson of the Local Fishing Community Organization of the Group for Releasing Blue Swimming Crab into Ban Don Bay of Thai Seas | Committee |
| 9. Chairperson of the Local Fishing Community Organization of Had Sai Kaew Small-scale Fishing Group | Committee |
| 10. Chairperson of the Local Fishing Community Organization of Fai Phru Small-scale Fishing Group | Committee |
| 11. Representative of Tha Chana District: Mr. Piya Sae-ear | Committee |
| 12. Representative of Tha Chang District: Mr. Jirok Puakkliang | Committee |
| 13. Representative of Phun Phin District: Mr. Pramot Salee | Committee |
| 14. Representative of Muang District: Mr. Thanawon Naksuwan | Committee |
| 15. Representative of Kanchanadit District: Mr. Jarong Plodchum | Committee |
| 16. Representative of Donsak District: Mr. Supphalak Tiewbutr | Committee |
| 17. Chairperson of Forest and Sea for Life Foundation | Committee |
| 18. Chief of Tha Chana Fisheries District Office | Committee |
| 19. Chief of Chaiya Fisheries District Office | Committee |
| 20. Chief of Tha Chang Fisheries District Office | Committee |
| 21. Chief of Phun Phin Fisheries District Office | Committee |
| 22. Chief of Muang Surat Thani Fisheries District Office | Committee |
| 23. Chief of Kanchanadit Fisheries District Office | Committee |
| 24. Chief of Donsak Fisheries District Office | Committee |
| 25. Head of Lang Suan Marine Fisheries Patrol Unit (Chumphon) | Committee |
| 26. Head of Fisheries Administration and Management Group, Surat Thani Fisheries Provincial Office | Committee |
| 27. Fisheries Technical Officer, Chumphon Marine Fisheries Research and Development Center | Committee |

28. Chairperson of the Local Fishing Community Organization of Phum Riang
Subdistrict Aquatic Resources Conservation Group
Committee
and Secretary

Terms of Reference for Operational Management Board for Fisheries *Refugia* in the Coastal Seas around the Area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province are:

1. Provide communities with management approaches in the area in accordance with Notification of Surat Thani Provincial Fisheries Committee Re: Prohibition of Some Fishing Gears Fishing in the Fishing Ground within the Coastal Seas around the Area of Koh Sed, Phum Riang Subdistrict, Chaiya District, Surat Thani Province, B.E. 2565, dated 8th March B.E. 2565 (2022);

2. Cooperate with relevant agencies in planning and implementing activities and projects for area management in fisheries *refugia* site;

3. Review and evaluate progress in implementation of the activities and projects, and make an improvement for the effectiveness of the area management;

4. Monitor fishing activities in fisheries *refugia* site in accordance with the Notification and coordinate with relevant agencies; and

5. Conduct any other activities that contribute to the effectiveness of the fisheries management for the sustainability of fisheries resources and ecosystem in Surat Thani fisheries *refugia* site.

This Notification shall be effective from now on.

Notified on 11th March B.E. 2565 (2022)

Signed Sakdaporn Rattanasupa

(Mr. Sakdaporn Rattanasupa)

Vice Governor, for the Governor of Surat Thani Province

ANNEX 6

(Unofficial Translation)

Notification of Trat Province**No. 1524/2565****Re: Appointment of Operational Management Board for Fisheries *Refugia* in Trat Province**

According to the mutual agreement of the Department of Fisheries and stakeholders in the coastal communities in five districts of Trat Province, namely, Mueang Trat District, Khlong Yai District, Laem Ngop District, Koh Chang District, and Koh Kut District on the establishment of fisheries *refugia*, particularly for short mackerel spawners, at the area of 966,250 rai in the fishing ground of Trat Province, pursuant to Notification of Ministry of Agriculture and Cooperatives Re: Prescribing Fishing Gears, Fishing Methods, Fishing Areas, and Conditions Prohibited from Fishing in some Parts of the Fishing Ground in Trat Province, B.E. 2565, dated 26th May B.E. 2565 (2022);

In order for effectively operational management and the achievement of being a fisheries *refugia*, Operational Management Board for Fisheries *Refugia* in Trat Province shall be appointed, comprising the following members:

- | | |
|---|------------------|
| 1. Director of Trat Fisheries Provincial Office | Advisor |
| 2. President of the Fisheries Association of Trat | Chairperson |
| 3. Mayor of Had Lek Subdistrict | Vice-Chairperson |
| 4. Chief of Mueang Trat Fisheries District Office | Committee |
| 5. Chief of Khlong Yai Fisheries District Office | Committee |
| 6. Chief of Koh Chang Fisheries District Office | Committee |
| 7. Chief of Laem Ngop Fisheries District Office | Committee |
| 8. Chief of Khao Saming Fisheries District Office | Committee |
| 9. Head of Fisheries Administration and Management Group,
Trat Fisheries Provincial Office | Committee |
| 10. Fisheries Technical Officer, Rayong Marine Fisheries Research
and Development Center | Committee |
| 11. President of Trat Small-scale Fishing Sea Watch Association | Committee |
| 12. President of the corporate Fisher Association of Khlong Yai District | Committee |
| 13. Chairperson of the Local Fishing Community Organization
of Koh Chang Ecotourism Small-scale Fishing Boats | Committee |
| 14. Chairperson of the Local Fishing Community Organization
of Ban Nam Chieo Ecotourism Small-scale Fishing Boats | Committee |
| 15. Chairperson of the Local Fishing Community Organization
of Khlong Takhian Small-scale Fishing Group | Committee |
| 16. Chairperson of the Local Fishing Community Organization
of Had Lek Sub-district Fishing Group | Committee |
| 17. Chairperson of the Local Fishing Community Organization
of Ban Salak Khok Coastal Fishing Group | Committee |
| 18. Chairperson of the Local Fishing Community Organization
of Ban Pak Khlong Small-scale Fishing Conservation Group | Committee |
| 19. Chairperson of the Local Fishing Community Organization
of Ban Khlong Lord Full-Egg-Crab Bank Group | Committee |
| 20. Chairperson of the Local Fishing Community Organization
of Koh Kut Small-scale Fishing Group | Committee |
| 21. President of Ruam Chai Purse Seine Association | Committee |
| 22. Chairperson of the Local Fishing Community Organization
of Blue Swimming Crab in Ban Laem Klat | Committee |
| 23. Mr. Sak Sahwatdi, Representative of the Local Fishing Community | |

- | | |
|---|-------------------------|
| Organization of Ao Yai Coastal Small-scale Fishing Conservation Group | Committee |
| 24. Mr. Praiwan Si-in, a member of Trat Marine and Coastal Resources Committee | Committee |
| 25. Representative of Sustainable Development Foundation | Committee |
| 26. Chairperson of the Local Fishing Community Organization of Nom Klao Marine Conservation Group | Committee and Secretary |

Terms of Reference for Operational Management Board for Fisheries *Refugia* in Trat Province are:

1. Provide communities with management approaches in the area in accordance with Notification of Ministry of Agriculture and Cooperatives Re: Prescribing Fishing Gears, Fishing Methods, Fishing Areas, and Conditions Prohibited from Fishing in some Parts of the Fishing Ground in Trat Province, B.E. 2565, dated 26th May B.E. 2565 (2022);
2. Cooperate with relevant agencies in planning and implementing activities and projects for area management in fisheries *refugia* site;
3. Review and evaluate progress in implementation of the activities and projects, and make an improvement for the effectiveness of the area management;
4. Monitor fishing activities in fisheries *refugia* site in accordance with the Notification and coordinate with relevant agencies; and
5. Conduct any other activities that contribute to the effectiveness of the fisheries management for the sustainability of fisheries resources and ecosystem in Trat fisheries *refugia* site.

This Notification shall be effective from now on.

Notified on 25th August B.E. 2565 (2022)

Signed Chamnanwit Terat

(Mr. Chamnanwit Terat)

Governor of Trat Province

ANNEX 7

List of Fisheries *Refugia* in the South China Sea and Gulf of Thailand

No. in map	Fisheries <i>refugia</i> Site	Target Species	Area (ha)	Fishing Closure Period	Status	Habitat Linkages
1	Marine Fisheries Management including Refugia at Koh Po & Koh Tonsay Archipelago, Kep, Cambodia	Blue swimming crab (<i>Portunus pelagicus</i>)	11,307 (417ha FR)	May-Jul (3 months)	Approved (12-04-2018)	CR-52ha SG-755ha
2	Prek Thnaot, Kampot, Cambodia	Groupers	8,008 (332ha FR)	Sep-Nov. (3 months)	Final process	CR-347ha SG-269ha
3	Prek Sangke, Village, Tek Thlar Commune, Prey Nub District, Preah Sihanouk, Cambodia	Blood Cockle (<i>Anadam granosa</i>)	116	Jun-Oct (5 months)	Approved (20-08-2020)	NA
4	Peam Krasob, Koh Kong, Cambodia	Indo-pacific mackerel (<i>Rastrelliger brachysoma</i>)	1,283	Dec-Mar (3 months)	Approved (16-09-2019)	CR-NA SG-NA
5	Off Trat, Thailand	Indo-pacific mackerel (<i>Rastrelliger brachysoma</i>)	154,600	Jan-Feb (2 months)	Approved (26-05-2022)	CR-2814ha SG-1016ha MG-9553ha
6	Eastern coastal area of Phu Quoc – Kien Giang, Viet Nam	Blue swimming crab (<i>Portunus pelagicus</i>)	32,860		Ongoing	
7	Around Koh Sed, Surat Thani, Thailand	Blue swimming crab (<i>Portunus pelagicus</i>)	900	Whole Year	Approved (08-03-2022)	SG-8.13ha MG-2.94ha
8	Tanjung Leman, Johor, Malaysia	Spiny lobster (<i>Panulirus polyphagus</i>)	171,549	Dec-Feb (3 months)	Final process	SG-706ha
9	Off Tuing Village, Bangka Regency, Indonesia	Squid (<i>Uroteuthis chinensis</i>)	468,828		Final process	MG-
10	Kubu Raya (Padang Tikar), Ketapang (Delta Pawan) and North Kayong (Dusun Besar)/West Kalimantan, Indonesia	Penaeid shrimp (<i>Penaeus merguensis</i>)	414,807		Final process	CR- SG-
11	Kuala Baram, Miri, Sarawak, Malaysia	Black tiger prawn (<i>Penaeus monodon</i>)	85,200	Aug-Oct (3 months) Feb-Apr (catch/release)	Final process	Miri-Sibuti CR National Park: 186,930ha
12	Off Coron Islands, Palawan, Philippines	Redbelly yellowtail fusilier	163.2	Closure Period	Final process	CR- ?? ha
13	Masinloc coastal area, Zambales, Philippines	One-stripe fusilier	120.69	Closure Period	Final process	MG- ?? ha
14	Bolinao coastal area, Pangasinan, Philippines	Siganids	99.84	Closure Period	Final process	SG- ?? ha
15	Coastal area of Lagi – Binh Thuan, Viet Nam	Subcrenata ark clam (<i>Anadara subcrenata</i>)	73,900		Ongoing	
TOTAL AREA			1,423,742			

ANNEX 8

MANAGEMENT PLAN FOR FISHERIES *REFUGIA* AT SURAT THANI SITE OF THAILAND

Component	Issues
Ecosystem	<ol style="list-style-type: none"> 1. Decrease of blue swimming crab resources 2. A large number of young blue swimming crabs are caught by gill nets and crab traps 3. Deterioration of coastal habitats and nursery grounds 4. Discharges from communities and agricultural activities 5. Marine debris
Good governance	<ol style="list-style-type: none"> 1. Insufficient cooperation and integration of multi-stakeholders 2. Existences of illegal fishing (e.g., small trawling, push netting, collapsible shrimp trapping) 3. Inefficient law enforcement 4. Insufficient awareness of resources conservation 5. Insufficient understanding of fisheries resources management 6. Conflicts among fishers 7. Lack of efficient database for fisheries management
Socio-economy	<ol style="list-style-type: none"> 1. Fishers' low incomes 2. Low price of fish fixed by middlemen 3. High cost of fishing operations 4. Low possibility of accessing the government sources of funding/credit 5. Lack of alternative/ additional occupations 6. Insufficient knowledge of fish processing and marketing 7. Insufficient knowledge and skill for running eco-tourism

Vision: Sustainably managed blue swimming crab resources in Surat Thani fisheries *refugia* site that contributes to healthy ecosystem and human well-being under good governance

Ecosystem	Good governance	Socio-economy
Goal	Goal	Goal
1. Sustainably rehabilitated and managed blue swimming crab resources and their nursery grounds	2. Good governance in blue swimming crab resources management	3. Improved livelihood of fishers and fishing communities
Objectives	Objectives	Objectives
1. To reduce catch of young blue swimming crabs and berried female blue swimming crabs 2. To enhance abundance of blue swimming crab resources 3. To rehabilitate and protect the habitats of blue swimming crab resources	4. To enhance cooperation and integration of multi-stakeholders 5. To enhance efficiency of fishery regulatory compliance and law enforcement 6. To promote awareness building of sustainable fisheries and coastal resources management 7. To develop spatial database in fisheries <i>refugia</i> area	8. To increase incomes of fishing households 9. To reduce cost of fishing operations 10. To increase possibility of accessing the government sources of funding/credit 11. To enhance operation of alternative occupations

Target, management actions, key performance indicators (KPIs), and responsible agencies for each objective

Management actions	KPIs	Responsible agencies
Objective 1: To reduce catch of young blue swimming crabs and berried female blue swimming crabs		
Target: Catches of young blue swimming crabs and berried female blue swimming crabs decrease by 10 percent within 2 years		
1. Promote mutual community agreements for sustainable fisheries resources utilization in fishing communities 2. Promote community activities for release of berried female blue swimming crabs into the sea	1. Community agreements are set up in at least 3 fishing communities within 2 years 2. Activities for release of berried female blue swimming crabs into the sea are conducted in at	1. CMDEC/ PFO/ MO/ LFCOs 2. MO/ PFO/ CMDEC/ DMCR/ Fish processing plants/ LFCOs

Management actions	KPIs	Responsible agencies
3. Promote community activities for release of immature blue swimming crabs into the sea	least 3 communities within 2 years 3. Activities for release of immature blue swimming crabs into the sea are conducted in at least 3 communities within 2 years	3. MO/ PFO/ CMDEC/ DMCR/ Fish processing plants/ LFCOs

Objective 2: To enhance abundance of blue swimming crab resources

Target: CPUE of blue swimming crabs increase by 5 percent within 2 years

1. Promote establishment of blue swimming crab banks	1. At least 5 units of blue swimming crab banks are increased within 2 years	1. PFO/ MO/ CMDEC/ Academics / LFCOs
2. Release the seeds of blue swimming crab and other aquatic animals	2. seeds of blue swimming crab and other aquatic animals are released at the number of over 1,000,000 individuals/year	2. MO/ PFO/ CMDEC/ DMCR/ Fish processing plants/ LFCOs
3. Establish community learning centers	3. Learning center is established in at least 1 community within 2 years	3. MO/ PFO/ CMDEC/ DMCR/ Fish processing plants/ LFCOs
4. Conduct research on the increase of survival rate in blue swimming crab bank	4. At least 1 research paper on the increase of survival rate in blue swimming crab bank is produced within 2 years	4. CMDEC/ Academics / PFO/ LFCOs
5. Conduct surveys for data collection of fisheries and habitats of blue swimming crab resources	5. Twelve surveys for data collection of fisheries and habitats of blue swimming crab resources are conducted each year	5. CMDEC/ DMCR/ PFO/ Academics/ LFCOs

Objective 3: To rehabilitate and protect the habitats of blue swimming crab resources

Target: One aquatic animal conservation zone is established within 2 years

1. Disseminate the information of notified fisheries <i>refugia</i> in Surat Thani Province	1. At least 4 channels are accessed for information dissemination of notified fisheries <i>refugia</i> in Surat Thani Province within 2 years	1. CMDEC/ PFO/ MO/ LFCOs
2. Set up the poles with reflective painting for steady fisheries <i>refugia</i> boundary marking	2. the poles with reflective painting for steady fisheries <i>refugia</i> boundary marking are set up within 2 years	2. MO/ PFO/ MD/ PAO/ CMDEC/ LFCOs

Management actions	KPIs	Responsible agencies
3. Support establishment of community aquatic animal conservation zones	3. At least 5 community aquatic animal conservation zones are established within 2 years	3. CMDEC/ PFO/ MO/ LFCOs
4. Conduct mangrove plantation	4. Mangrove areas are stable within 2 years	4. CMDEC/ DMCR/ PFO/ MO/ LFCOs/ Private sectors
5. Conduct activities on seagrass conservation	5. Seagrass areas are stable within 2 years	5. CMDEC/ DMCR/ PFO/ MO/ LFCOs
6. Establish natural-material artificial reefs	6. Natural-material artificial reefs are established in at least 1 community sea area within 2 years	6. MO / DMCR/ PFO/ LFCOs/ PAO
7. Prepare the processes for quality control of water discharges from communities and agricultural activities	7. Quality control of water discharges from communities and agricultural activities is conducted in at least 1 community within 2 years	7. PNE/ PCD/ CADEC/ PAEO/
8. Conduct activities on debris disposal	8. At least 1 community is involved in the activities on debris disposal within 2 years	8. MO/ District office/ LFCOs

Objective 4: To enhance cooperation and integration of multi-stakeholders

Target: One ecosystem-based fisheries management group is established within 2 years

1. Establish ecosystem-based fisheries management groups	1. At least 1 ecosystem-based fisheries management group is established within 2 years	1. MO/ CMDEC/ PFO/ LFCOs
2. Set mutual community agreements for sustainable fisheries resources utilization in fishing communities	2. At least 1 community agreement is set up within 2 years	2. MO/ CMDEC/ PFO/ LFCOs
3. Establish network of Koh Sed conservation groups	3. At least 5 communities are engaged in the network of Koh Sed conservation groups within 2 years	3. PFO/ CMDEC/ MO/ LFCOs
4. Prepare ecosystem-based fisheries management plans in cooperation with multi-stakeholders	4. Ecosystem-based fisheries management plans in cooperation with multi-stakeholders are prepared for at least 1 community within 2 years	4. CMDEC/ SEAFDEC/ PFO/ MO/ LFCOs
5. Propose ecosystem-based management plans to responsible agencies and stakeholders in the communities for adoption and for budget allocation	5. At least 4 responsible agencies allocate budget for ecosystem-based management implementation in communities	5. LFCOs/ CMDEC/ PFO/ MO
6. Conduct community relations activities aimed at minimizing conflicts among fishers	6. At least 2 community relations activities are conducted within 2 years	6. MO/ District office/ LFCOs
7. Promote incentive activities for crab donation	7. At least 1 incentive activity for crab donation is conducted within 2 years	7. MO/ PFO/ processing plants

Objective 5: To enhance efficiency of fishery regulatory compliance and law enforcement

Management actions	KPIs	Responsible agencies
Target: Illegal fishers decrease by 20 percent within 2 years		
1. Conduct integrated illegal fishing surveillance 2. Promote establishing fisheries/coastal surveillance center in Chaiya District 3. Conduct training for assistant fisheries officers to the fishers in fishing communities	1. Illegal fishers decrease by at least 20 percent within 2 years 2. A Fisheries/coastal surveillance center is established in Chaiya District within 2 years 3. At least 15 fishers are trained to be assistant fisheries officers within 2 years	1. DOF/ RTN/ DMCR/ PAO/ SAO/ MO/ LFCO/ FA 2. DOF/ DMCR/ FPC/ MCPC/ PFO/ MO/ LFCOs 3. FPC/ LFCOs
Objective 6: To promote awareness building for sustainable fisheries and coastal resources management		
Target: Awareness building for sustainable fisheries and coastal resources management is attended by 100 fishers or over within 2 years		
1. Promote community awareness building for ecosystem-based fisheries management 2. Promote awareness building for sustainable use of coastal and fisheries resources to the youth in communities	1. Awareness building for ecosystem-based fisheries management is attended by at least 100 fishers within 2 years 2. Awareness building for sustainable use of coastal and fisheries resources is attended by at least 100 children in communities within 2 years	1. CMDEC/ SEAFDEC/ PFO/ MO/ LFCOs 2. CMDEC/ Schools/ PFO/ MO
Objective 7: To develop spatial database in fisheries <i>refugia</i> area		
Target: There are an accessible spatial database in fisheries <i>refugia</i> area within 2 years		
1. Develop spatial database in fisheries <i>refugia</i> area 2. Promote information dissemination for accessing database in fisheries <i>refugia</i> area to fishers in communities	1. A spatial database in fisheries <i>refugia</i> area is successfully developed within 2 years 2. At least 50 percent of fishers can access spatial database in fisheries <i>refugia</i> area within 2 years	1. CMDEC/ DMCR/ PFO/ MO/ Academics/ LFCOs 2. PFO/CMDEC/ LFCOs
Objective 8: To increase incomes of fishing households		
Target: Incomes of fishing households increase by 5 percent within 2 years		
1. Promote increase of fish price by establishing community fish markets, strengthening community fish market networks, enhancing fish marketing channels, etc. 2. Renovate fishing piers for the purpose of community tourism activities	1. Incomes of fishing households increase by at least 5 percent within 2 years 2. One fishing pier is renovated for the purpose of community tourism activities	1. DOF/ MO/ PAO/ PCO/ LFCOs 2. MO/ TAT/ PAO/ PPRO/ LFCOs/ Academics

Management actions	KPIs	Responsible agencies
Objective 9: To reduce cost of fishing operations Target: One fishing gear support group is established within 2 years		
1. Establish fishing gear support groups 2. Promote household accounting	1. At least 1 fishing gear support group is established within 2 years 2. At least 10 percent of fishing households do household accounting within 2 years	1. PFO/ MO 2. PCAO
Objective 10: To increase possibility of accessing the government sources of funding/credit Target: Fishers assessing the government source of funding/credit increase by 10 percent within 2 years		
1. Promote cooperation of government funding sources for providing fund/credit to fishers	1. Fishers assessing the government source of funding/credit increase by at least 10 percent within 2 years	1. PCAO/ Financial institutes
Objective 11: To enhance operation of alternative occupations Target: fishers operating alternative occupation increase by 10 percent within 2 years		
1. Promote developing fish processing activities and setting fish processing groups 2. Promote alternative occupations, such as eco-friendly aquaculture, etc. 3. Promote eco-tourism in communities with a linkage between tourism business and small-scale fishing	1. At least 2 fish processing groups are created within 2 years 2. Fishers operating alternative occupations increase by at least 10 percent within 2 years 3. Eco-tourism activities are increasingly operated by at least 1 fishing community within 2 years	1. PFO/ CDO/ MO/ PIO/ PAEO 2. PFO/ CDO/ MO/ PIO/ PAEO 3. MO/ TAT/ PPRO/ CDO/ LFCOs

Acronyms of responsible agencies:

CADEC	Coastal Aquaculture Research and Development Center
CDO	Community Development Office
CMDEC	Chumphon Marine Fisheries Research and Development Center
DMCR	Department of Marine and Coastal Resources
DOF	Department of Fisheries
FA	Fisheries Association
FPC	Fisheries Patrol Center
LFCO	Local Fisheries Community Organization
MCPC	Marine and Coastal Patrol Center
MD	Marine Department
MO	Municipal Office
PAEO	Provincial Agricultural Extension Office
PAO	Provincial Administrative Organization
PCAO	Provincial Cooperative Auditing Office
PCD	Pollution Control Department
PCO	Provincial Commerce Office
PFO	Provincial Fisheries Office
PIO	Provincial Industrial Office
PNE	Provincial Office of Natural Resources and Environment
PPRO	Provincial Public Relations Office
RTN	Royal Thai Navy
SAO	Subdistrict Administrative Organization
SEAFDEC	South East Asian Fisheries Development Center
TAT	Tourism Authority of Thailand

ANNEX 9

MANAGEMENT PLAN FOR FISHERIES *REFUGIA* AT TRAT SITE OF THAILAND

Component	Issues
Ecosystem	<ol style="list-style-type: none"> 1. Decrease of short mackerel resources 2. Short mackerels are caught during their spawning season 3. Deterioration of habitats, spawning and nursery grounds 4. Deterioration of environment 5. Discharges from communities and agricultural activities
Good governance	<ol style="list-style-type: none"> 1. Insufficient cooperation and integration of multi-stakeholders 2. Existences of illegal fishing (e.g., trawling, push netting, collapsible shrimp trapping) 3. Inefficient law enforcement 4. Insufficient understanding of fisheries resources management 5. Conflicts among fishers 6. Irresponsible fishing of non-Thai fishing vessels 7. Lack of efficient database for fisheries management
Socio-economy	<ol style="list-style-type: none"> 1. Fishers' low incomes 2. Low price of fish fixed by middlemen 3. High cost of fishing operations 4. Low possibility of accessing the government sources of funding/credit 5. Lack of alternative/ additional occupations

6. Insufficient knowledge of fish processing and marketing

7. Insufficient knowledge and skill for running eco- tourism

Vision: Sustainably managed short mackerel resources and strong fishing communities under ecosystem-based fisheries management and good governance in Trat Province

Ecosystem	Good governance	Socio-economy
Goals	Goal	Goal
1. Sustainably rehabilitated short mackerel resources 2. Rehabilitated and protected spawning grounds of short mackerels resources	3. Good governance in short mackerel resources management	4. Improved livelihood of fishers and fishing communities
Objectives	Objectives	Objectives
1. To reduce catches of short mackerel spawners and young short mackerels 2. To promote and maintain fisheries <i>refugia</i> for short mackerel in Trat Province 3. To promote establishment of fisheries <i>refugia</i> for short mackerel in communities	4. To enhance cooperation and integration of multi-stakeholders 5. To enhance efficiency of fishery regulatory compliance and law enforcement 6. To promote awareness building of sustainable fisheries and coastal resources management 7. To develop spatial database in fisheries <i>refugia</i> area	8. To increase incomes of fishing households 9. To reduce cost of fishing operations 10. To increase possibility of accessing the government sources of funding/credit 11. To enhance operation of alternative occupations

Target, management actions, key performance indicators (KPIs), and responsible agencies for each objective

Management actions	KPIs	Responsible agencies
<p>Objective 1: To reduce catches of short mackerel spawners and young short mackerels Target: Catches of short mackerel spawners and young short mackerels decrease by 10 percent within 2 years</p>		
<ol style="list-style-type: none"> Promote mutual community agreements for short mackerel fishing in fishing communities Conduct campaign activities against fishing of short mackerels in their spawning season Conduct campaign against marketing and consuming of young short mackerels Promote awareness building for ecosystem-based fisheries management to communities Conduct surveys for fisheries data Conduct researches cooperating with communities 	<ol style="list-style-type: none"> Community agreements are set up in at least 5 fishing communities within 2 years At least 2 campaign activities against fishing of short mackerels in their spawning season are conducted every year At least 4 channels are accessed for campaign against marketing and consuming of young short mackerels within 2 years At least 1 activity for awareness building of ecosystem-based fisheries management to communities is conducted within 2 years Twelve surveys for fisheries data are conducted each year At least 1 research paper on short mackerel resources and status is produced within 2 years 	<ol style="list-style-type: none"> DOF/ DMCR/ PFO/ PAO/ SAO/ MO/ LFCOs/FA/ Academics DOF/ DMCR/ PAO/ SAO/ MO/ LFCOs/ FA/ Academics DOF/ DMCR/ PAO/ SAO/ MO/ LFCOs/ FA/ Academics DOF/ DMCR/ SEAFDEC/ Academics DOF/ DMCR/ Academics/ LFCOs/ FA DOF/ DMCR/ Academics/ LFCOs/ FA
<p>Objective 2: To promote and maintain fisheries <i>refugia</i> for short mackerel in Trat Province Target: There are 3 activities to promote and maintain fisheries <i>refugia</i> for short mackerel in Trat Province within 2 years</p>		
<ol style="list-style-type: none"> Disseminate the information of notified fisheries <i>refugia</i> in Trat Province Promote public relations on the information of notified fisheries <i>refugia</i> in Trat Province before closure period 	<ol style="list-style-type: none"> At least 4 channels are accessed for dissemination of the information of notified fisheries <i>refugia</i> in Trat Province within 2 years At least 2 activities of public relations on the information of notified fisheries <i>refugia</i> in Trat Province before closure period are conducted 	<ol style="list-style-type: none"> DOF/ DMCR/ PAO/ SAO/ MO/ LFCOs/FA/ Academics DOF/ DMCR/ PAO/ SAO/ MO/ LFCOs/FA/ Academics

Management actions	KPIs	Responsible agencies
3. Conduct campaign activities against water pollution, chemical substances, and marine debris	<p>within 2 years</p> <p>3. At least 3 campaign activities against water pollution, chemical substances, and marine debris are conducted every within 2 years</p>	3. DMCR/DOF/ PFO/ PAO/ SAO/ MO/ LFCOs/FA/ NGOs/ CE/ Private sector
<p>Objective 3: To promote establishment of fisheries <i>refugia</i> for short mackerel in communities</p> <p>Target: There is 1 fisheries <i>refugia</i> for short mackerel established in a community</p>		
<p>1. Promote establishment of fisheries <i>refugia</i> for short mackerel in communities</p> <p>2. Set mutual community agreements for management of fisheries <i>refugia</i> for short mackerel in communities</p> <p>3. Promote Establishing natural-material artificial reefs</p>	<p>1. At least 1 community conducts the activity of establishing fisheries <i>refugia</i> for short mackerel within 2 years</p> <p>2. At least 1 community agreement created for management of fisheries <i>refugia</i> for short mackerel in a community within 2 years</p> <p>3. Natural-material artificial reefs are established in at least 1 community sea area within 2 years</p>	<p>1. DOF/ DMCR/ PFO/ PAO/ SAO/ MO/ LFCOs/ FA/ Academics</p> <p>2. DOF/ DMCR/ PFO/ PAO/ SAO/ MO/ LFCOs/ FA/ Academics</p> <p>3. DOF / DMCR/ MD/ PAO/ LFCOs</p>
<p>Objective 4: To enhance cooperation and integration of multi-stakeholders</p> <p>Target: Three ecosystem-based fisheries management groups are established within 2 years</p>		
<p>1. Establish ecosystem-based fisheries management groups</p> <p>2. Set mutual community agreements for ecosystem-based fisheries management in fishing communities</p> <p>3. Prepare ecosystem-based fisheries management plans in cooperation with multi-stakeholders</p> <p>4. Promote participation in Trat Seas Conservation Network</p>	<p>1. At least 3 ecosystem-based fisheries management groups are established within 2 years</p> <p>2. At least 3 community agreements are set up in 3 fishing communities within 2 years</p> <p>4. Ecosystem-based fisheries management plans in cooperation with multi-stakeholders are prepared for at least 3 communities within 2 years</p> <p>4. Numbers of the members of Trat Seas Conservation Network increase 5 percent within 2 years</p>	<p>1. DOF/ DMCR/ PAO/ SAO/ MO/ Academics/ LFCOs/ FA</p> <p>2. DOF/ DMCR/ PAO/ SAO/ MO/ Academics/ LFCOs/ FA</p> <p>4. DOF/ DMCR/ SEAFDEC/ Academics/ LFCOs/ FA/ PAO/ SAO/ MO/PFO</p> <p>4. DOF/ DMCR/ SAO/ MO/ LFCOs/ FA/ NGOs</p>
5. Conduct bilateral meeting for co-management of short mackerel resources with neighboring countries	5. At least one bilateral meeting concerning fisheries management with neighboring country is conducted within 2 years	5. DOF/ SEAFDEC

Management actions	KPIs	Responsible agencies
6. Conduct community relations activities aimed at minimizing conflicts among fishers	6. At least 2 community relations activities are conducted within 2 years	6. PAO/ SAO/ MO/ PFO/ DOF/ DMCR/ LFCOs/FA

Objective 5: To enhance efficiency of fishery regulatory compliance and law enforcement

Target: Illegal fishers decrease by 20 percent within 2 years

1. Conduct integrated illegal fishing surveillance in fisheries <i>refugia</i> area	1. Illegal fishers decrease by at least 20 percent within 2 years	1. DOF/ RTN/ DMCR/ PAO/ SAO/ MO/ LFCO/ FA
2. Conduct training for assistant fisheries officers to the fishers in fishing communities along fisheries <i>refugia</i> area in Trat Province	2. At least 15 fishers are trained to be assistant fisheries officers within 2 years	2. FPC/ LFCOs

Objective 6: To promote awareness building of sustainable fisheries and coastal resources management

Target: Awareness building for sustainable fisheries and coastal resources management is attended by 100 fishers or over within 2 years

1. Promote community awareness building for ecosystem-based fisheries management to communities along fisheries <i>refugia</i> area in Trat Province	1. Awareness building for ecosystem-based fisheries management is attended by at least 100 fishers within 2 years	1. DOF/ DMCR/ SEAFDEC/ Academics/ LFCOs/ FA/ PAO/ SAO/ MO/PFO
2. Promote awareness building for sustainable use of fisheries and coastal resources to the youth in communities	2. Awareness building for sustainable use of fisheries and coastal resources is attended by at least 100 children in communities within 2 years	2. DOF/ DMCR/ Schools/ SAO/ MO

Objective 7: To develop spatial database in fisheries *refugia* area

Target: There are an accessible spatial database in fisheries *refugia* area within 2 years

1. Develop spatial database in fisheries <i>refugia</i> area	1. A spatial database in fisheries <i>refugia</i> area is successfully developed within 2 years	1. DOF/ DMCR/MD/ PAO/ SAO/ MO/ Academics/ LFCOs/ FA
2. Promote information dissemination for accessing database in fisheries <i>refugia</i> area to fishers in communities	2. At least 50 percent of fishers can access spatial database in fisheries <i>refugia</i> area within 2 years	2. DOF/ PAO/ SAO/ MO/ Academics/ LFCOs/ FA

Objective 8: To increase incomes of fishing households

Target: Incomes of fishing households increase by 5 percent within 2 years

Management actions	KPIs	Responsible agencies
1. Promote increase of fish price by establishing community fish markets, strengthening community fish market networks, enhancing fish marketing channels, etc.	1. Incomes of fishing households increase by at least 5 percent within 2 years	1. DOF/ MO/ PAO/ PCO/ LFCOs
Objective 9: To reduce cost of fishing operations Target: Two fishing gear support groups are established within 2 years		
1. Establish fishing gear support groups	1. At least 2 fishing gear support groups are established within 2 years	1. DOF/ PAO/ SAO/ PFO/ MO/ FA/ NGO
2. Promote alternative energy, such as solar cells	2. At least 2 communities apply the use of alternative energy within 2 years	2. DOF/ PAO/ SAO/ PFO/ MO/ FA/ NGO
3. Promote household accounting	2. At least 10 percent of fishing households do household accounting within 2 years	2. PCAO
Objective 10: To increase possibility of accessing the government sources of funding/credit Target: Fishers assessing the government source of funding/credit increase by 10 percent within 2 years		
1. Promote cooperation of government funding sources for providing fund/credit to fishers	1. Fishers assessing the government source of funding/credit increase by at least 10 percent within 2 years	1. PCAO/ Financial institutes
Objective 11: To enhance operation of alternative occupations Target: fishers operating alternative occupation increase by 10 percent within 2 years		
1. Promote developing fish processing activities and setting fish processing groups	1. At least 2 fish processing groups are created within 2 years	1. PFO/ CDO/ MO/ PIO/ PAEO
2. Promote alternative occupations, such as eco-friendly aquaculture, etc.	2. Fishers operating alternative occupations increase by at least 10 percent within 2 years	2. PFO/ CDO/ MO/ PIO/ PAEO
3. Promote eco-tourism in communities with a linkage between tourism business and small-scale fishing	3. Eco-tourism activities are increasingly operated by at least 2 fishing communities within 2 years	3. MO/ TAT/ PPRO/ CDO/ LFCOs

Acronyms of responsible agencies:

CDO	Community Development Office
CE	Community Enterprise
DMCR	Department of Marine and Coastal Resources
DOF	Department of Fisheries
FA	Fisheries Association
FPC	Fisheries Patrol Center
LFCO	Local Fisheries Community Organization
MD	Marine Department
MO	Municipal Office
NGO	Non-governmental Organization
PAEO	Provincial Agricultural Extension Office
PAO	Provincial Administrative Organization
PCAO	Provincial Cooperative Auditing Office
PCO	Provincial Commerce Office
PFO	Provincial Fisheries Office
PIO	Provincial Industrial Office
PPRO	Provincial Public Relations Office
RTN	Royal Thai Navy
SAO	Subdistrict Administrative Organization
SEAFDEC	South East Asian Fisheries Development Center
TAT	Tourism Authority of Thailand

ANNEX 10**BUDGET BALANCE AS AT 15ST DECEMBER 2022**

Overall allocated budget	7,368,704.92	Baht
Total expenditure as at 15 th December 2022	7,296,875.40	Baht
Closing balance as at 15 th December 2022	71,829.52	Baht

Expenditure Details:

Item	2017 (Jul-Dec)	2018	2019	2020	2021	2022 (1 Jan – 15 Dec)	Total
1. Project personnel and consultant	148,000.00	603,000.00	952,000.00	850,000.00	768,000.00	903,000.00	4,224,000.00
2. Travel on official business	24,056.79	36,440.00	76,326.00	31,853.60	89,535.75	147,622.11	405,834.25
3. Sub-contracts for study on area contexts of Trat and Surat Thani fisheries <i>refugia</i> site				216,320.00			216,320.00
4. Sub-contracts for study on ecosystem around Koh Sed of Surat Thani Province				265,236.00			265,236.00
5. Technical data collection at Trat fisheries <i>refugia</i> site				50,000	25,000.00		75,000.00
6. Local consultation workshops on fisheries <i>refugia</i> boundary and management planning at Trat Site	1,050.00	124,996.00		145,700.50			271,746.50
7. Local consultation workshops on fisheries <i>refugia</i> boundary and management planning at Surat Thai Site	2,325.00	119,803.00			181,921.00		304,049.00
8. Workshop on fisheries <i>refugia</i> management planning (Trat Site and Surat Thani Site)						111,242.00	111,242.00
9. Workshop on on Fisheries <i>Refugia</i> Boundary Marking at Surat Thani Site						60,840.00	60,840.00

Item	2017 (Jul-Dec)	2018	2019	2020	2021	2022 (1 Jan – 15 Dec)	Total
10. Study visit at fisheries <i>refugia</i> sites in Cambodia						159,647.26	159,647.26
11. Training-workshop on socio-economic study and value chain analysis of fisheries				36,870.87			36,870.87
12. Training-workshop on the introduction of ecosim program for the assessment and management of fisheries resources					9,700.00		9,700.00
13. Training-workshop on diving for coastal resources survey						107,934.00	107,934.00
14. Meeting of the National Fisheries Refugia Committee		525.00	2,100.00	700.00	3,628.00	4,883.00	11,836.00
15. Meeting of the National Scientific and Technical Committee		24,782.00	20,358.00	26,974.56	3,790.50	244,551.72	320,456.78
16. Meeting of the site-based management boards (Trat and Surat Thani)			183,709.00	51,787.50	46,530.50	201,875.50	483,902.50
17. Printing cost for reports concerning fisheries refugia						30,000.00	30,000.00
18. Expendable equipment for fisheries <i>refugia</i> dissemination installed in the areas of fisheries <i>refugia</i> sites in Trat Province and Surat Thani Province						97,840.00	97,840.00
19. Expendable equipment for computer appliance	4,815.00	16,640.00	19,779.72	3,878.75	12,759.75	25,145.50	83,018.72
20. Operation and maintenance of equipment						22,401.52	22,401.52
Total	180,246.79	926,186.00	1,254,272.72	1,679,321.78	1,140,865.50	2,115,982.61	7,296,875.40

ANNEX 11**COSTED WORK PLAN FOR THE PERIOD OF 16TH – 31ST DECEMBER 2022**

Closing balance as at 15 th December 2022	71,829.52	Baht
Costed work plan ending 31 st December 2022	71,829.52	Baht
Closing balance as at 31 st December 2022	00.00	Baht

Expenditure Details:

Item	2022 (15 th – 31 st Dec)
1. Travel on official business	1,000.00
2. Meeting of the National Fisheries Refugia Committee	4,500.00
3. Printing cost for reports concerning fisheries refugia	62,700.00
4. Expendable equipment for computer appliance	3,629.52
Total	71,829.52

ANNEX 12

MEETING ATMOSPHERE

