



No. 0510.2/11473

Department of Fisheries
Kaset Klang, Chatuchak
Bangkok, Thailand 10900

๒๕ December B.E. 2558 (2015)

Dear Mr. John Scanlon,

Subject: Additional information on seahorses in Thailand and Temporary ceasing the issuance of export permits for seahorses (*Hippocampus* spp.)

In response to the request made during the 14th and 15th Sessions of the Conference of the Parties of CITES (CoP14 and CoP15) and the 63rd and 65th Meetings of its Standing Committee (SC63 and SC65) for Thailand to conclude the implementation of recommendations (h), (i), (j), and (k) by 31 May 2015 and inform to the CITES Secretariat, I would like to inform you that during such period, the DOF Thailand was in the process of amending the country's Fishery Law with a view of enhancing its effectiveness in combating IUU fishing; and it is anticipated that the implementation of the new Fishery Law would also enhance the control over fishing gears catching seahorses, particularly trawl net and push net.

Furthermore, DOF Thailand also developed the new Marine Fisheries Management Plan (**Annex 1**), which stipulates the need to replace the "open-access" fisheries with "limited-access" through strengthening of surveillance measures, *e.g.* port-in/port-out inspection, Vessels Monitoring System (VMS), and enhancing coordination between patrol vessels and local communities. It is estimated that removal of unlicensed trawlers and push netters of 2,051 vessels would result in the decrease of 12.90 million hours of fishing efforts, accounting for 35.6 % of the country's present level of fishing efforts. In addition, the application of the VMS for vessels 30-meter GT and over would also prevent encroachment of fishing vessels in prohibited areas and during seasonal closures, and thus help ensuring the compliance and effective enforcement of measures for conservation and management of seahorses.

Specifically in response to the recommendations made by the SC63 and SC65, Thailand has undertaken actions as follows:

Recommendation (h):

Thailand implemented project to monitor seahorse catches, species composition, and length frequency distribution through:

- i) Data collection from research trawlers: Data was collected 4 times a year at 63 sampling sites in the Gulf of Thailand, and 22 sites in the Andaman Sea; and
- ii) Data collection from landing survey: Data was annually collected from: a) trawl, trap and gillnet fishers; and b) first-level traders to determine the changes in CPUE (**Annex 2**).

Recommendation (i):

Thailand continued its attempts to refine mapping of seahorses with habitats, *i.e.* mangroves, seagrass beds and coral reefs. Four methods were applied, namely: interview of fishers; survey using government research trawlers; scientific diving surveys; and citizen science contributions.

As a result, it was found that seahorses inhabited both offshore and inshore areas, from shallow water of 0-5 meter up to 120-meter depth. Seahorses were caught as by-catch mainly from trawlers. Specifically, *H. kelloggi* was caught mainly by trawlers; *H. kuda* by small-scale traps and gill-netters; while *H. spinosissimus* by trawlers and small-scale traps. Report on part of life history parameters of three species of *Hippocampus* is being prepared (Annex 3).

Recommendation (j):

On “direct seahorses management measures,” fishers are encouraged to follow management measures, the first of which was the release of seahorses of smaller than 10-cm back to the sea. Information was also provided to first-level trader not to buy such small-size seahorses to ensure that small-size seahorses would not enter in trade system. The second measure was the release of seahorse males carrying babies back to the sea.

On “conservation of seahorses in Thailand,” breeding of seahorses has been undertaken for over 20 years, with success cases reported since 1990s for *Hippocampus kuda*. Specifically in 1999 in the occasion of H.M. the King’s 72nd birthday, 9,999 juvenile seahorses were released. Since then, the Institute of Marine Science, Burapha University started initiating seahorse stock enhancement and conservation programs in Thai waters.

Recognizing the declination of wild seahorses population in Thai waters, DOF Thailand also undertook activities on breeding of seahorses for stock enhancement since 2004, focusing on five species indigenous to Thai waters, namely *Hippocampus spinosissimus*, *H. mohnikei*, *H. kelloggi*, *H. kuda* and *H. comes*; and one species from the Philippines, *i.e.* *H. barbouri*. Hatchery-produced juveniles were released back into their natural habitats every year. Such activity was undertaken in collaboration with groups of scuba diver volunteers with the primary aim of raising social awareness on conservation of the species. From 2008-2014, 12 releasing events were organized with more than two thousand seahorses released (Annex 4).

Recommendation (k):

The Government of Thailand endorsed the new Royal Ordinance on Fisheries in November 2015 with the primary aim to reform the country’s existing Fishery Law and facilitate the implementation of actions to combat IUU fishing. Several new policies and regulations related to trawlers were also issued accordingly. In addition, the DOF Thailand also developed its new Marine Fisheries Management Plan, which stipulates required actions and measures, particularly to replace the “open-access” fisheries with “limited-access” in order to balance the level of fishing efforts and the available fishery resources based on the Maximum Sustainable Yield (MSY) (Annex 5).

While the country is in the process of undertaking several research studies to collect information on biology, status of wild population, as well as breeding of the species for stock enhancement, the DOF Thailand has recently issued an announcement to temporarily cease the issuance of export permits for seahorses as precautionary measure to ensure that trade of seahorse would not result in detriment to the country's status of seahorse population (**Annex 6**).

In conclusion, I would like to assure you that Thailand has successfully established adaptive management programs that are sufficient to prevent the catch of non-targeted seahorses by fishing vessels, and monitor the trade of three species of *Hippocampus* spp., which enable the review of relevant management measures to ensure that trade would not become detrimental to the survival of the species in the wild; and compliance with Article IV, paragraphs 2(a), 3 and 6(a) of the CITES Convention.

Yours sincerely,



(Dr. Wimol Jantrarotai)
Director - General

Enclosed:

- Annex 1: Marine Fisheries Management Plan
- Annex 2: project to monitor seahorse
- Annex 3: Report on part of life history parameters of seahorse
- Annex 4: conservation of seahorses in Thailand
- Annex 5: Order of the Head of the National Council for Peace and Order No.10/2558
- Annex 6: Notification of Department of Fisheries

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Current fisheries management measures in Thailand from FMP.

Management measures include:

All fishing vessels

- Must be registered where they are intended to operate.
- Some types of fishing gears prescribed under the Ministerial Regulations must be licensed;
- Numbers trawlers, push nets, Anchovy purse seiners and Anchovy lift nets, controlled under the Ministerial Regulations, must be frozen; and
- Commercial fishing vessels ≥ 30 GT are required to install VMS as they have a capacity to operate in waters outside Thailand.

For fishing vessels importing fish into Thailand, depending on the type of vessel

- Port in-port out measures;
- Port State measures; and
- A range of measure for artisanal fishing vessels from neighbouring countries, including (note: Full Port State Measures not applied to these vessels yet)
 - Registered at the port to record vessel details;
 - Submission of a copy of their fishing license;
 - Information on the vessel, fishing activity and catch;
 - Advance notification prior to port in;
 - Thai Officer inspections.

Technical measures include:

All commercial fishing

- Protection of spawning stock and juveniles through closed seasons and areas;
- Demarcation zones between artisanal and commercial fisheries; and
- Reduction of the efficiency of fishing gear according to the requirements for suitable mesh sizes, such as purse seines, trawls, anchovy lift nets, collapsible crab traps and gill nets.

Trawl fishing

- Reduce fishing capacity by the enlargement of mesh size and the limitation of the ground rope.

Purse seine fishing

- Reduce fishing capacity through limitation of mesh size; and
- Control fishing areas by zoning (special case of anchovy fishery).

Push net fishing

- Ban on all push nets except fishing for *Acetes* (Sergestids) nets.

Encircling gill nets

- Reduce fishing capacity through closed seasons and areas to protect spawners, especially for Indo-Pacific mackerel.

Other Management measures and activities in Thailand include:

- Prohibiting trawlers and push net from fishing within 3 nautical miles from the coastline;
- Marine Protected Areas (MPAs) for full protection varies from aquatic sanctuaries, non-hunting area, marine national park, mangrove swamps, coral reef areas, sea grass bed etc. The total area of MPA in Thailand is around 79,756.72 km². It is about 25.23 % of total sea area in Thai water (316,118.24 km²); and
- Reserved areas for special purposes, e.g. coral reefs, sea grass beds and mangroves.

DoF is carrying out other conservation measures including:

- Establishing artificial reefs for spawning grounds, fish shelter; and
- Promoting community-based fishery management and EAFM.

Zonation

Thailand has defined two fishing zones within Thai waters based on the characteristic of seabed in the Gulf of Thailand and in the Andaman Sea – Coastal Fishing Zone and Offshore Fishing Zone.

Gulf of Thailand

- Coastal Fishing Zone from the mean low water line to 6 nm (11.11 km),
- Coastal Fishing Zone for islands from the mean low water line to 3 nm (5.56 km)

Andaman Sea

- Coastal Fishing Zone from the mean low water line to 3 nm (5.56 km),
- Coastal Fishing Zone for islands from the mean low water line to 1.62 nm (3.00 km)

Only artisanal fishing vessels are permitted to fish in the Coastal Fishing Zone. The rationale for this are (i) Coastal Fishing Zone is the habitat for juvenile fishes that are less impacted by artisanal fishing gear, (ii) if complied with, conflicts between artisanal and commercial fishers are reduced, and (iii) safety at sea for small vessels is improved.

Scientific basis for technical measures

Push net

The MOAC Ministerial Notification dated 20 July 1972 prohibited the use of trawlers and push net within 3,000m of the coast (later expanded to 5,400 m in some areas). The MOAC Ministerial Notification dated 26 March 1980 restricted the use of trawlers and push net with motor vessels by controlling the number of trawlers and push netters. DoF has conducted surveys and studies since 1987 that concluded that push nets are destructive gears because:

1. Push nets can damage other fishing gear. It has caused socio-economic problems between artisanal and commercial fisheries;
2. Push nets are non-selective and can catch both spawning fish and juveniles; and
3. Push nets have caused severe damage of ocean floor and benthic ecosystem.

Set Bag Net

Since 1978, the MOAC Ministerial Notification No.4 dated 14 September 1978 prohibited the use of set bag net and other set net-liked gears. DoF found that the use of set bag net have caused the destruction of juveniles of many species; disrupting of waterway and blocking migration routes of several fish species.

Nighttime Purse Seiner with net size less than 2.5 cm

Since 1991, MOAC issued Ministerial Notification dated 14 November 1991 prohibiting the use of surrounding nets having meshes smaller than 2.5 centimeters. This fishing gear is highly efficient because it is equipped with light to attract fish school. The nets catch a large number of juvenile of several species such as mackerels, sardines, hard-tailed scads and squids. In addition, it obstructs the recruitment of fish population.

Elongate collapsible trap

This new developed gear is highly efficient due to its length and number of opening into the trap. It catches a large number of aquatic juveniles, including juveniles of banana prawn and jinga shrimp causing serious decline of their stock.

Trawl cod end of mesh size smaller than 5 cm

DoF studies and those of other countries have demonstrated that increasing the mesh size can lower the catch of juvenile fish. It has been decided that suitable cod end mesh size should be 5.0 cm.

Fishing License System and Fisheries Controls of Thailand

The authorization of fishing licenses in the Kingdom of Thailand is conducted under the new Royal Ordinance for Fisheries B. E. 2558 (2015), which is under the drafting process. Each year, the fishing licenses are granted with consideration to resources availability in order to promote resources sustainability. The fishing license allocation committee and the marine fisheries resource utilization committee, in which the Department of Fisheries is a committee and secretary, will be established to consider the number of fishing licenses granted annually. For granting Thai overseas fishing licenses, it will be considered under the cooperation among the Thai government and coastal States and relevant Regional Fisheries Management Organizations (RFMOs). Thai fishing license system has two components as follows:

1. Types of fishing licenses: Thai fishing licenses are classified into four groups as the following:

- (1) Fishing licenses for artisanal fishing vessels, which are divided into two sub-groups, i.e. fishing licenses for small artisanal fishing vessels and fishing licenses for large artisanal fishing vessels;
- (2) Fishing licenses for small commercial fishing vessels;
- (3) Fishing licenses for medium commercial vessels; and
- (4) Fishing licenses for large commercial fishing vessels

The criteria for granting fishing licenses are as follows:

- 1.1 The granted number of fishing licenses is based on the consideration of the fishing license allocation committee and the marine fisheries resource utilization committee;
- 1.2 Licensee must be the owner of fishing vessel or leaseholder with legal leasing contract;
- 1.3 Licensed small, medium and large commercial fishing vessels must conform to the fishing area color coding as established by the Department of Fisheries;
- 1.4 District Chief Officers, Minor District Chief Officers, and the Director of Bangkok Provincial Fisheries Office for Bangkok area have the authority to issue fishing licenses;
- 1.5 The fishing license shall be valid for one year and expire on 31 December of each year. The license must be renewed 60 days before the expiry date. Renewal of license will be considered based upon the fishing history of previous year. The renewal of license will be suspended for any IUU fishing engaged, i.e., 3-6 month suspension for small-commercial fishing vessels and 6 months to one year suspension for medium and large commercial fishing vessels;
- 1.6 Small, medium and large commercial fishing vessels can apply for fishing license of only one type of fishing gears, but artisanal fishing vessels may apply for the fishing license of more than one type of fishing gears;
- 1.7 License fee will be imposed based on types and numbers of fishing gears;
- 1.8 Commercial fishing vessels shall install VMS and submit fishing operation report through Port-in and Port-out control system, as well as record on fishery logbooks; and
- 1.9 For fishing vessels with capacity over 100 gross tonnages, there must be observers on board. (To be further discussed with involved agencies.)

2. Thai overseas fishing licenses are divided into 2 groups:

- (1) Fishing licenses for operation in the EEZ(s) of coastal states and
- (2) Fishing licenses for operation on the high seas.

The criteria for granting overseas fishing licenses are as follows:

- 2.1 Department of Fisheries will seek for overseas fishing grounds and resources quotas by arranging bilateral fisheries agreements with coastal States. Fishing vessels that are willing to operate overseas must obtain the license to use Thai fishing vessel outside Thai jurisdictional waters before applying for a contract/fishing license with other coastal States or conducting fisheries on the high seas;

- 2.2 The licensing authority is the Director General of the Department of Fisheries;
- 2.3 Fishing licenses shall be valid for one year or based on the agreement of coastal States;
- 2.4 The duty charge is based on the monitoring expenses, i.e. the expense for VMS monitoring agencies and the expense for observers on board; and
- 2.5 Fishers must install VMS on board, record on fishing logbooks, and arrange for observers on board. Furthermore, they must abide by the Port State Measure Agreement, the regulations of the flag state, the agreements of RFMOs, and relevant international agreements.

3. Vessel licenses for transshipment of marine catch are divided into 2 groups:

- (1) Vessel license for domestic transshipment of marine catch
- (2) Vessel license for transshipment of marine catch outside Thai waters

The vessel licensing criteria for transshipment of marine catch are as follows:

- 3.1 The vessel licensing authorities are the Governor (in case of the vessel license for domestic transshipment of marine catch) and the Director General of the Department of Fisheries (in case of vessel license for transshipment of marine catch outside Thai waters);
- 3.2 Transshipment vessels of marine catch must install VMS and submit their Port-in and Port-out reports while being in Thai waters, or comply with the Port State Measures while being outside Thai waters. Transshipment vessels of marine catch must abide by the regulations of the port states, the agreements of RFMOs, and relevant international agreements;
- 3.3 Observers on board must always present during transshipping marine catch. Domestic transshipment of marine catch must proceed in the areas assigned by the Department of Fisheries. Transshipping marine catch outside Thai waters must abide by regulations of the port states, the agreements of RFMOs, and relevant international agreements;
- 3.4 Marine catch transshipment vessels must provide the Marine Catch Transshipment Document(MCTD), as well as submit the fishing log book of applicable fishing vessels and the records of observers on board; and
- 3.5 The duty charge is based on the monitoring expenses, i.e. the expense for VMS monitoring agencies and the expense for observers on board.

Monitoring program landings site of seahorse in Thailand

Establish a detailed monitoring program of landings of the three *Hippocampus* species at representative sites, taking into account different gear types and means of extraction and recording catch and effort metrics and provide a report to the Secretariat;

Thailand Department of Fisheries will plan to monitor seahorses in two ways. First we will continue to collect seahorse data during quarterly research trawls throughout the Gulf and Andaman coasts. Second, Thailand Department of Fisheries (DoF) will monitor landing sites quarterly, on the Gulf and Andaman Coasts, of the major gears catching seahorses. Additionally we will analyze this data every year to monitor the status of the stock

1) Seahorse distribution from research vessel surveys

DoF conduct to update the seahorse distribution maps from spatial data on seahorse gathered by our research vessel, determine quarterly and annual catch rates, species composition, sex ratios, then revise estimates of biomass.

There are 5 marine fisheries research and development centers under Marine Fisheries Research and Development Division involved with research surveys and data collection:

1. Upper Gulf Marine Fisheries Research and Development Center
2. Central Gulf Marine Fisheries Research and Development Center
3. Southern Marine Fisheries Research and Development Center
4. Eastern Gulf Marine Fisheries Research and Development Center
5. Andaman Sea Marine Fisheries Research and Development Center

Current and future monitoring data of sea horse in CPUE was collected by standard otter board trawl from five research vessels to investigate the status of sea horse. The research vessel operated 4 times in January, March, May and July yearly at pre-determined locations in both the Andaman and Gulf Coasts (station in Table 1 and Figure 1). Trawl speed was set at 2.5 nautical miles / hour. Research trawls took place within each location for one hour.

Table 1. Survey station for research vessel

	Area	Station number
Gulf of Thailand (63)	Area 1	42 44 57
	Area 2	18 20 28 30 38 40
	Area 3	2 5 7 9 11
	Area 4	14 16 24 26 34 36 47 49
	Area 5	58 60 62 73 75 87 89 101 103
	Area 6	117 119 136 138 156 158 177 179 181
	Area 7	201 221 243 245 268 270
	Area 8	294 296 319 321 345 347 371 373
	Area 9	395 397 399 420 422 424 445 447 466
Andaman Sea (22)	Area 1	1 3 4 7 8
	Area 2	11 12 16 21
	Area 3	14 17 23 27 29
	Area 4	30 32 34 36 37 38 39 43

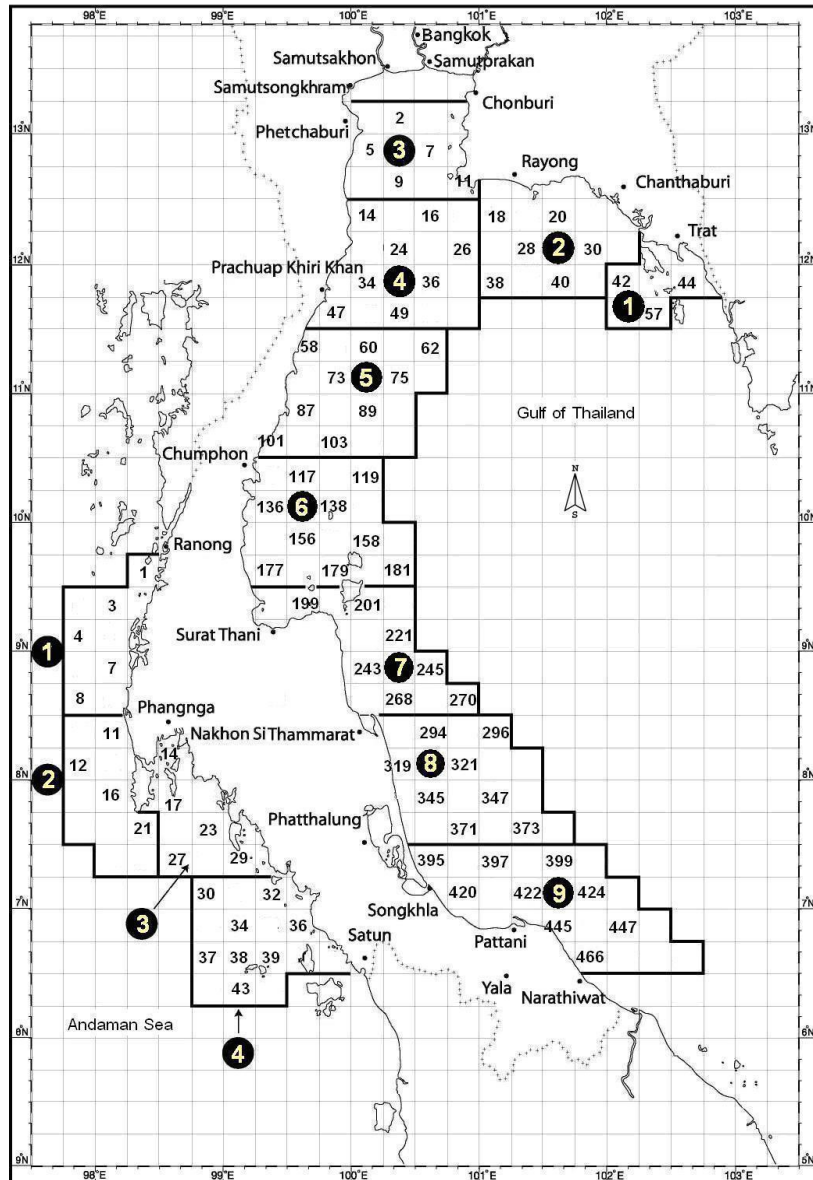


Figure 1: Survey stations by research vessels in the Gulf of Thailand and the Andaman Sea.

During data collection on the research vessel the presence or absence of seahorse(s), the species composition and sex ratio per haul is documented. From this information Thai's DoF researcher can determine quarterly and annual catch rates based on the number of seahorses per haul and the number of hauls with seahorses. Additionally they can monitor the species composition and sex ratio of seahorses.

We will revise our estimate of seahorse biomass based on future information from research vessel survey by trawl. Biomass estimation by swept area method from DoF's research vessel

Let C_w be the catch in weight of a haul. Then C_w/t is the catch in weight per hour, when t is the time spent hauling (in hours). Let a be the area swept. Then a/t is the area swept per hour. For the estimation of the biomass we use the catch per unit area (CPUA), It is estimated by dividing the catch by swept area (in kilometers). (Sparre and S. V. Venema, 1992)

$$\text{Biomass} = \text{CPUA} * A/X$$

where

- CPUA is the catch per unit area (kg/km²)
 A is area of survey per one hour (km²)
 X is retention coefficient

CPUA is the catch per unit area equal to C_w / a (kg/km²)

The swept area (a) can be estimate from

$$a = D * h, D = V * t$$

where

- V is velocity of the trawl over the ground when trawling (2.5 knot or 2.5 nautical mile/hour = 4.63 kilometer/hour)
 h is the length of head-rope of trawl net (39 meter = 0.039 kilometer)
 t is the time spent trawling (1 hour)
 C_w is the catch in weight of a haul (kg).

A is area of survey per one hour equal to 1 grid of research survey (15 *15 nautical miles) 15 nautical miles equal to 27.78 km. Then 1 grid is equal to $27.78 * 27.78 = 771.73 \text{ km}^2$

The value of X is usually chosen between 0.5 and 1.0. For trawlers in Southeast Asia as value of X = 0.5 is commonly used in survey work (Isarankura, 1971; Seager, Martosubroto and Pauly, 1980).

The following sets of maps have been created and will continue to be updated with new information from the DoF research vessels.

Under the cooperation between Thailand and Project Seahorse, scientific diving and citizen science contributions (i-seahorse) were used to seek out and analyse seahorse population.

2) Landings data from trawl trap and gillnet fisheries and the first level trader

For landing data, Thai DoF planned to collect data from 3 landing sites along the Gulf of Thailand and 2 landing sites along the Andaman Sea for update the status of sea horse on quarterly basis. The data consisted of catch rate (total number of seahorses in total hauls or days spent fishing), species composition and length of seahorse form main fishing gears that caught seahorse. And also Thai DoF can get the information on species in trade from interviewing the first level trader.

Landing site	3 landing sites along the Gulf of Thailand and 2 landing sites along the Andaman Sea
Gear	Trawl fisheries, trap and gill-net fisheries
Data	Catch rate, species composition in fishing and in trade and length of sea horse
Month	January May September annually

From this information we can compare future catch rates to catch rates calculated with 2013/2014 data (currently being analyzed by joint DoF and Project Seahorse team) to identify changes over time. Additionally we can determine if there is a change in species composition to identify which gears are exerting pressure on the different seahorse species. We will compare mean length at vulnerability to the fisheries with known length at reproductive maturity by species to identify if any fisheries show signs of overfishing.

life history parameters of the three *Hippocampus* species

i) Conduct a detailed study of the life history parameters of the three *Hippocampus* species, including growth rate, size and age at maturity, average annual reproductive output, and annual survivorship of different age classes and provide a report to the Secretariat. Based on the outcome of this study, model population responses to exploitation pressures in order to review and revise management measures;

The information on life history of sea horse had preliminary progress report in “Implementing CITES for Seahorses in Thailand Project” (Project I.D.0002/1306) in 2013 under Office of the National Research Council of Thailand (NRCT). Table 2, initial analysis of life history data from six *Hippocampus* species sampled at landing sites along the Andaman Coast. Results include the total number of sampled individuals, average height of individuals in centimeters, previously estimated size at first maturity, height of smallest pregnant male, total number of pregnant males, number of juveniles and sampled sex ratio. *For *Hippocampus trimaculatus*, an additional 25 individuals were observed and identified to the species level, but we were unable to record additional life history information.

Table 2 Life history data from six *Hippocampus* species sampled at landing sites along the Andaman Coast.

Species	<i>H. comes</i>	<i>H. histrix</i>	<i>H. kelloggi</i>	<i>H. kuda</i>	<i>H. spinosissimus</i>	<i>H. trimaculatus</i>
No. of individuals	6	2	65	2	67	89*
Average height (cm)	14.2	11.3	17.5	15.8	12.9	11.9
Estimated sizes at first maturity (previous studies)	8.1 ¹	7.9 ¹	15.0 ¹	14.0 ¹	10.0 ²	9.1 ²
Smallest pregnant male (cm, this study)	16.7	10.2	15.2	N/A	11.2	7.5
Total no. pregnant males	2	1	17	0	13	20
No. of juveniles	0	0	8	0	7	16
M: F ratio	1: 1	1:1	1:1.3	0: 2	1: 1.0	1:1.2

¹ Foster & Vincent 2004

² Lawson et al, Project Seahorse, unpublished data

Sex ratios were close to one to one for all species except for *H. kuda*, where both sampled individuals were female. We found the largest number of juveniles for *H. trimaculatus* but did not observe juveniles in our port sampling for *H. comes*, *H. histrix*, or *H. kuda*. The smallest pregnant males observed in this study were comparable in size to previously estimated sizes at first maturity for *H. kelloggi*, *H. spinosissimus* and *H. trimaculatus*. We still need to model population size at maturity with our samples to make a proper comparison to past research. Unfortunately, we can not yet model maturity for *H. comes*, *H. histrix* or *H. kuda* due to small samples sizes.

Thailand is currently working with Project Seahorse to model population responses to exploitation pressure through the use of an age-structured model. With this research we have incorporated known information about life history parameters of *Hippocampus trimaculatus*, one of the dominant seahorse species in Thailand’s trade. This research is ongoing but we anticipate its completion in the beginning half of 2016.

Conservation of seahorses in Thailand

Thailand has focused on breeding of seahorses for conservation purpose for over 20 years. The successes on breeding and culture of seahorses in captivity were reported since 1990s beginning with the species *Hippocampus kuda*. In the year of the King Bhumibhol's 72th Birthday in 1999, a number of 9,999 juvenile seahorses produced from culture were released into the sea by the Institute of Marine Science, Burapha University, initiating of seahorse stock enhancement and conservation in Thai waters since then.

Besides awareness of the declining seahorse natural stocks, during the past 10 years Thailand Department of Fisheries has taken into consideration the need of breeding of seahorses for stock enhancement. Five species of seahorses indigenous to Thai waters, *Hippocampus spinosissimus*, *H. mohnikei*, *H. kelloggi*, *H. kuda* and *H. comes*, and one species from the Philippines *H. barbouri*, have been successfully bred in the DOF hatchery since 2004. Since then the hatchery-produced juveniles were released into their natural habitats every year. The seahorse releasing programme was attempted to promote raising social awareness on conservation of the species. The activities were performed by collaboration with groups of SCUBA divers volunteers with impressive success. With one active

group from SaveOurSea.net SCUBA team, more than two thousand seahorses were released in 12 releasing events organized in 2008-2014.

Species successfully bred in captivity by Thailand Department of Fisheries

H. spinosissimus since 2004

H. barbouri since 2005

H. mohnikei since 2006

H. kelloggi since 2007

H. kuda since 2011

H. comes since 2012

Seahorse releasing activities operated by Thailand DOF in cooperation with volunteer SCUBA divers from SaveOurSea.net

Year	Number	species	Release Sites
2008	100	<i>H. spinosissimus</i>	Anemone reef, Krabi
2009	50	<i>H. kelloggi</i>	HIn Muang, Krabi
2010	100	<i>H. spinosissimus</i>	Koh Ha, Krabi
	140	<i>H. spinosissimus</i>	Similan Islands
		<i>H. kelloggi</i>	and
2011	120	<i>H. spinosissimus</i>	South Andaman (Krabi,
	200	<i>H. spinosissimus</i>	Satun) Richelieu, Surin, TaChai)
2012	150	<i>H. kuda</i> and <i>H. spinosissimus</i>	North Andaman (Surin, Similan Islands)
	100	<i>H. kuda</i>	Koh Ha, Krabi and Satun
2013	200	<i>H. comes</i>	West of Eden Similan
	200	<i>H. comes</i>	Islands Koh Ha, Krabi and Satun
2014	200	<i>H. comes</i>	North Andaman (Similan, Richelieu,
	200		

	<i>H. comes</i>	Surin Islands)
		Koh Ha, Krabi
Total	2,090	

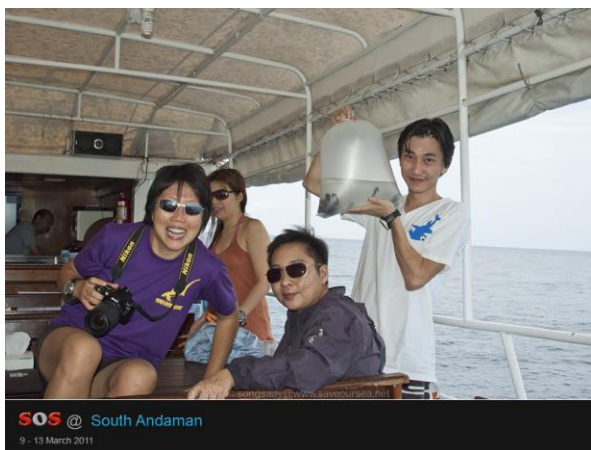
A number of 140 seahorses; *Hippocampus spinosissimus* and *H. kelloggi*, were released into the Similan Islands by government fisheries biologists and volunteer divers on 14-17 January 2010.

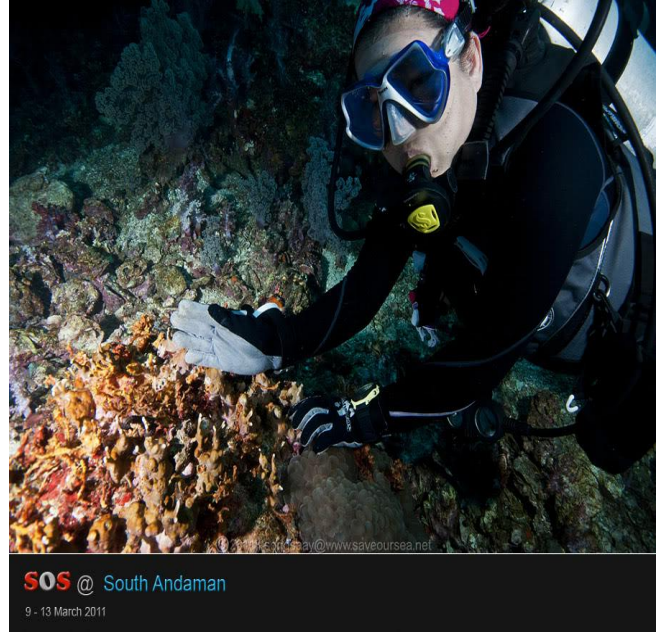
<http://www.bloggang.com/viewdiary.php?id=kookkies&month=01-2010&group=2&gblog=38&date=19>



Releasing a total number of 120 seahorses *H. spinosissimus* into the South Andaman Sea (Krabi and Satun) by fisheries biologists and volunteer divers in March 2011.

<http://www.saveoursea.net/forums/showthread.php?t=1474>





Releasing a total number of 100 seahorses *H. kuda* into the South Andaman Sea (Krabi and Satun) by fisheries biologists and volunteer divers in April 2012.

<http://www.saveoursea.net/forums/showthread.php?t=2075>





Releasing a total number of 200 seahorses *H. comes* into the North Andaman Sea by fisheries biologists and volunteer divers in January-February 2013.

<http://www.saveoursea.net/forums/showthread.php?t=2435>





Releasing a total number of 200 seahorses *H. comes* into the North Andaman Sea (Similan Islands and Surin Islands) by fisheries biologists and volunteer divers in February 2014.

<http://www.saveoursea.net/forums/showthread.php?t=2831>





ORDER
OF THE HEAD OF THE NATIONAL COUNCIL FOR PEACE AND ORDER
No. 10/2558
ACTIONS AGAINST ILLEGAL, UNREPORTED AND UNREGULATED FISHING

Referring to the notification of the European Union requiring Thailand to strengthen the measures for prevention, deterrence and elimination of illegal, unreported and unregulated fishing (IUU fishing), if there is no concrete and urgent action against this problem within six months, an exportation of fish products of Thailand and national security may be affected eventually. It is therefore necessary to solve this problem sustainably and systematically by upgrading Thai's fishing standards to meet with international requirements and rendering relief to fishermen and related industries and stakeholders. If no action is taken urgently, the national economy of the country may be affected adversely. In order to prevent and solve the aforesaid problem, the Head of the National Council for Peace and Order, by virtue of section 44 of the Constitution of the Kingdom of Thailand (Interim), B.E. 2557 (2014) and with the approval of the National Council for Peace and Order, has an order, as follows:

Clause 1. There shall establish the "Command Centre for Combating Illegal Fishing," to be called in brief as CCCIF. CCCIF is a special task force responsible directly to the Prime Minister. The Commander-in-Chief of the Royal Thai Navy shall be the commander of CCCIF. CCCIF shall commence its mission under this Order as from the 1st day of May B.E. 2558 (2015).

Clause 2. CCCIF composes of the followings:

(1) the Committee Against Trafficking in Humans and Illegal Fishing established by the Order of the Prime Minister No. 52/2558 dated 17th February B.E. 2558 (2015); acting as national policy and regulating unit;

(2) the Royal Thai Navy (RTN) and the National Maritime Benefit Protection Coordination Centre (NMBPCC) established by the resolution of the National Securities Council dated 10th January B.E. 2540 (1997) as adopted by the resolutions of the Council of Ministers on 17th April B.E. 2540 (1997) and on 9th January B.E. 2541 (1998); acting mainly as coast and off-shore operation unit of CCCIF and acting in cooperation with any other related agency;

(3) the Port In-Port Out Controlling Centre (PCC) and Fishing One Stop Service Centre (FOSSC) to be established in all provinces-by-the-sea by the notification of CCCIF.

Clause 3. CCCIF shall have the powers and duties as follows:

(1) to prepare Thailand's National Plan of Action to Prevent, Deter and Eliminate IUU Fishing (NPOA-IUU), to regulate an execution of such plan and to establish understanding with the European Union;

(2) to control, order, supervise and arrange all operations of the Ministry of Agriculture and Co-operatives, the Ministry of Transport, the Ministry of Interior, the Ministry of Labour, the Royal Thai Police and other related government agencies in relation to IUU fishing;

(3) to provide consideration and recommendation for the revision, amendment and reform of laws, rules and regulations in relation to IUU fishing to meet with international standard, particularly to the prevention of IUU fishing and suitable penalties;

(4) to lay down organisation structure and personnel of CCCIF. This structure shall consist of PCC and FOSSC in all Provinces-by-the-sea;

(5) to recruit official from government official or officer of any government agency as appropriate;

(6) to appoint committee, sub-committee and working group to be responsible for particular matter as it deems appropriate;

(7) to invite qualified person, government official, officer of any State agency or private agency as well as other related agencies and stakeholders to attend the meeting for determining operative guideline, cooperation and monitoring as appropriate;

(8) to cooperate with related agencies in order to strengthen cooperation with the third countries, especially the countries where Thai flag vessels conduct fishing within their territorials, for the compliance with international obligations;

(9) to report the result of operation to the Head of the National Council for Peace and Order for acknowledgement until the European Union lifts its notification on IUU fishing on Thailand;

(10) to conduct any other act as entrusted by the Prime Minister.

Clause 4. NMBPCC shall have the powers and duties as follows:

(1) to establish special task force, composing of vessels, aircrafts and personnel from related agencies in order to conduct law enforcement, and to control of activity, in the sea as notified by CCCIF responsively;

(2) to control and order all agencies working under NMBPCC;

(3) to integrate sea-related information of all concerning agencies through information technology system for updated situation in the sea;

(4) to recruit official from the agencies working under NMBPCC to work at Sea-related Information Exchange Centre (SIEC) so as to monitor, verify and examine illegal fishing of fishing boat. In this regards, SIEC shall also acting as the Monitoring, Control and Surveillance Centre (MCS) to establish the complete traceability system as soon as possible;

(5) to conduct any other act as entrusted by CCCIF.

Clause 5. The Bureau of Budget shall allocate budget to CCCIF and NMBPCC for their executions of powers and duties through official budgetary procedure.

Clause 6. The owner or entrepreneur of fishing vessel, freezer vessel as well as any vessel used for fishing, or for transferring or maintaining aquatic animals from any vessel used for fishing, of exceeding 30 gross ton or as determined by CCCIF shall:

(1) prepare the fishing log in accordance with the form, period and procedure as notified by CCCIF;

(2) equip vessel monitoring system (VMS) in compliance with performance standard and functional requirements as notified by CCCIF within the period as notified by CCCIF;

(3) report port-in and port-out of vessel to PCC in accordance with the rules and procedure as notified by CCCIF.

After having equipped the vessel with the VMS, the owner or entrepreneur under paragraph one shall disclose the access code thereof to CCCIF and the VMS shall always be turn on while sailing in the sea so as to enable the official to identify location of the vessel. If such device is out of order or unable to send location of vessel by whatever reason, the rules of procedure as notified by CCCIF shall be proceeded.

The owner or entrepreneur under paragraph one shall be responsible for all expenses incurring from the access to the system for vessel location identification.

Clause 7. The registrar of vessel under the law on Thai vessel shall revoke the registration of Thai vessel used for fishing or other vessels as notified by CCCIF and striking that vessel from registration book if:

(1) any circumstance under section 22 of the Thai Vessel Act, B.E. 2481 (1938) emerged;

(2) the owner of the vessel requests in writing to cancel the registration;

(3) the registered vessel fails to obtain ship's license or ship's license has expired for more than three consecutive years.

If the order under paragraph one has been made, the registrar of vessel shall notify in writing the owner of vessel to return ship's license within thirty days as from the date he receives that written notification from the registrar.

Clause 8. For the benefit of solving IUU fishing problem, no owner or entrepreneur of fishing vessel shall allow any person conducting the following acts to his vessel:

(1) having in possession of fishing gear which is not licensed to be used in fishing vessel;

(2) sailing fishing vessel with the fishing gears other than the gears identified in the fishing license, or with unlicensed fishing gear, from fishing pier;

(3) sailing fishing vessel which has not yet complied with the law on navigation in Thai water, the law on Thai vessel, the law on labour protection and the law on immigration from pier.

Clause 9. No person shall use fishing vessel to conduct fishing in territorial water of other States or in the high sea or sailing freezer vessel in territorial water of other States; provided that, the license of CCCIF has been granted in accordance with the rules, procedure and conditions as notified by CCCIF.

In granting of license under paragraph one, CCCIF may authorise related agency to act on its behalf.

Clause 10. No person shall use fishing vessel to conduct fishing in the water of other States or in the high sea in violation of rules and procedures of the Coastal State or of the Regional Fishing Organisation.

Clause 11. Whoever intends to sail fishing vessel, freezer vessel as well as any vessel used for fishing, or for transferring or maintaining aquatic animal from any vessel used for fishing, from Thai water or from the water of other States or the high sea into the Kingdom shall depart from or harbour at the pier or fish market pier as notified by CCCIF.

Clause 12. No person shall dock the foreign fishing vessel or freezer vessel listed in the banning vessel list as notified by CCCIF at any pier within the Kingdom.

Clause 13. The owner of vessel and fishing piers located in any Province-by-the-sea, including the pier located at any island, shall record information related to fishing vessel, freezer vessel as well as any vessel of all sorts and sizes which are used for fishing or for transportation or maintenance of aquatic animals and docked at his pier for inspection.

If the vessel under paragraph one is the vessel under clause 11, the owner of vessel and fishing pier shall gather and submit report related to port-in and port-out of such vessel to PCC in accordance with the rules and procedure as determined by CCCIF.

The record under paragraph one shall be made even if the owner or the possessor of the vessel refuses to report his port-in or port-out.

Clause 14. CCCIF and NMBPCC shall have the powers to appoint the competent official for the execution of this Order.

The competent official appointed under paragraph one shall have the powers to get on board of any vessel for examination and to detain any vessel which is not compliance with the provisions of this Order, law on navigation in Thai water, the law on Thai vessel, the law on fishing, the law on fishing rights within Thai fishing area, the law on labour protection and the other laws related to fishing and navigation.

In boarding on the vessel under clause 12, if there is a reasonable ground to suspect that such vessel involving in IUU fishing, the competent official shall have the power to have banning order on uploading aquatic animals or aquatic animal products therefrom. In case of foreign vessel, the competent official may order such vessel to travel abroad and shall inform the flag State and the Regional Fishing Organisation for further proceedings.

Clause 15. The competent official and the official of CCCIF and NMBPCC who necessarily acts in good faith upon non-discrimination and proportional basis to cease or deter the commission of any illegal act shall not be liable to any civil, criminal or disciplinary charge, but this is not prejudice to the right of the injured person to claim for compensation from the official under the law on liability of official in the commission of wrongdoing act.

Clause 16. All related government and State agencies shall, for the achievement of prevention and elimination of IUU fishing, seriously enforce the laws under their responsibilities and shall act in compliance with the NPOA-IUU efficiently. All shall enhance their efficiencies and capacities in the registration of vessel, the issuance and renewal of ship's license, the issuance of fishing license and other related official documents for the prevention of the commission of an offence.

Clause 17. For the effectiveness of this Order, in the case where the official of CCCIF or NMBPCC has an order to any government agency or State official to act or to refrain from doing any act for the purpose of this Order, if such government agency or State official fails or omits to do such act or fails to refrain from doing such act, the official of CCCIF or NMBPCC shall report to the commander of CCCIF. In this case, the commander of CCCIF shall have the power to rotate the head of that government agency or that official from his responsible area at once and shall then inform the Minister or the government agency where such head of government agency or official is attached for acknowledgement altogether with reason. The Minister or the government agency where such head of government agency or official is attached shall in such case discharge that official from duties or from the performance of duties without delay. If there is a reasonable ground of disciplinary violation, the superintendent having powers and duties to recruit and appoint that head of government agency or official shall proceed with disciplinary procedure accordance with the law on such matter.

The order of the commander of CCCIF under paragraph one is not subjected to the Administrative Procedure Act, B.E. 2539 (1996) and the Establishment of the Administrative Court and the Administrative Court Procedure Act, B.E. 2542 (1999).

Clause 18. Whoever violates or fails to comply with clause 6, clause 8, clause 9, clause 10 or clause 11 shall be liable to imprisonment for the term of not exceeding one year or to a fine of not exceeding one hundred thousand Baht or to both.

Clause 19. Whoever violates clause 12 shall be liable to a fine of not exceeding thirty million Baht.

Clause 20. Whoever violates or fails to comply with clause 7 paragraph two or clause 13 shall be liable to a fine of not exceeding ten thousand Baht.

Clause 21. Whoever repeats the commission of the offense under this Order shall be liable for two times.

Clause 22. In addition to the liability as imposed by this Order, all official documents or licenses in relation to the activities under this Order of the owner or entrepreneur of fishing vessel, freezer vessel as well as any vessel used for fishing, or for transferring or maintaining aquatic animals from any vessel used for fishing who violates or

fails to comply with this Order may be revoked by CCCIF. In this case, the government agency having powers to issue such official documents or licenses shall not issue the new documents or licenses to such person until the expiration of one year after the former documents or licenses had been revoked or the expiration of the period as notified by CCCIF.

Clause 23. The notification of CCCIF under this Order shall come into force upon its publication in the Government Gazette.

This Order shall come into force as from the date of its publication in the Government Gazette.

Given on the 29th Day of April B.E. 2558 (2015).

General Prayut Chan-o-cha

Head of the National Council for Peace and Order

Published in the Government Gazette Vol. 132, Special Issue 99 *Ngo*, dated 29th April B.E. 2558 (2015)

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Department of Fisheries Notification

Subject: Temporary ceasing the issuance of export permits for seahorses (*Hippocampus* spp.)

Seahorses are threatened with extinction, and are listed in the Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In accordance with the Trade Agreement of CITES, exploitation of wild seahorses for trade must not violate domestic laws, and not detrimental to the survival of the species in the wild. The range State shall also undertake studies on biology and abundant of the species in wild habitats.

To solve the problem faced by Thailand on exportation of seahorses, which was determined by the CITES Standing Committee as “Urgent Concern”, studies shall be urgently undertaken to obtain information on biology and diversity of seahorse species in Thailand in order to establish appropriate conservation and management measures for sustainable trade that are not detrimental to the species in the wild. The Department of Fisheries therefore issues interim measure to cease the issuance of export permits for seahorses (*Hippocampus* spp.).

This Notification shall come into force starting from 1 January 2016 onwards, until further notification.

This Notification was made on December 2015

(Signed) Dr. Wimol Jantrarotai

(Dr. Wimol Jantrarotai)

Director General

No. 0510.2/ 4905



Department of Fisheries
Kaset Klang, Chatuchak
Bangkok, Thailand 10900

๑๗ May B.E. 2559 (2016)

Dear Mr. John Scanlon,

Subject: Information on seahorses (*Hippocampus trimaculatus*) in Thailand during the past 2 years

In response to the recommendations made during the 27th Animal Committee Meeting and 66th Standing Committee Meeting of CITES, Thailand would like to provide updated information with regards to *Hippocampus trimaculatus* during the past 2 years as follow:

d) Provide information from studies (existing or new) that assess variation in the spatial and temporal abundance of H. trimaculatus to enable areas of high seahorse density to be identified, as the basis for considering area restrictions on nonselective fishing gear that obtains Hippocampus species as bycatch, and provide a report to the Secretariat;

From the research project on “Implementing CITES for seahorses in Thailand,” it was found that seahorses inhabited in both offshore and inshore areas, from shallow water up to 120-meters deep. Seahorses were caught as by-catch mainly from trawlers; and the areas with highest density of seahorses are the protected areas in Sameasan and Pattaya in Chonburi Province (in the Gulf of Thailand). Seahorses were also found abundant along the Andaman coast, including in the western of Similan Islands, around Racha Island, between Mai Thon and Phi Phi Islands, and in the northwestern of Tarutao Island. Additional areas that are also inhabited by seahorses are: around Tarutao and Adang Rawi Islands, around Rok Island, southern of Phi Phi to Mai Thon Islands, western of Surin Island; and between eastern of Surin Island and the mainland. Details of these areas are shown in **Annex 1** and **Annex 2**.

e) Develop and implement adequate control measures and inspection to enhance the enforcement of the reported ban on trawling within 3-5 km of the coast, as the main means of reducing incidental capture of H. trimaculatus;

The DOF Thailand developed the new Marine Fisheries Management Plan, which facilitates the undertaking of more effective surveillance measures, e.g. port-in/port-out inspection of fishing vessels, application of Vessels Monitoring System (VMS), and enhancing coordination between patrol vessels and local communities. Measures were also put in place to limit fishing capacity, and it is estimated that unlicensed trawlers and push netters of 2,051 vessels would be displaced. In addition, encroachment of fishing vessels of 30 GT and over in prohibited areas in the Gulf of Thailand and Andaman Sea during seasonal closures was also strictly prohibited through application of VMS, thus help ensuring effective enforcement and compliance with measures for conservation and management of seahorses.

Furthermore, notification was also issued by the Ministry of Agriculture and Cooperatives on restriction offishing gears, fishing methods, and prohibited fishing areas for 2016. (**Annex 3**)

f) Establish a detailed monitoring program of landings of *H. trimaculatus* at representative sites, taking into account different gear types and means of extraction and recording catch and effort metrics and provide a report to the Secretariat;

Thailand implemented the project to monitor seahorse catches, species composition, and length frequency distribution through:

- i) Data collection from research trawlers: Data was collected 4 times a year at 63 sampling sites in the Gulf of Thailand, and 22 sites in the Andaman Sea;
- ii) Data collection from landing survey: Data was annually collected from:
 - a) trawls, traps and gillnets fisheries; and
 - b) first-level traders to determine the changes in trade (**Annex 4**).

g) Implement additional measures, including spatial and/or temporal restrictions on fishing activities, to support non-detriment findings, in compliance with Article IV.2.a and IV.3.

The Government of Thailand endorsed the new Royal Ordinance on Fisheries in November 2015 with the primary aims to reform the country's existing Fishery Law and facilitate the implementation of actions to combat IUU fishing. Several new policies and regulations related to trawlers were also issued accordingly. In addition, the DOF Thailand also developed its new Marine Fisheries Management Plan, which stipulates required actions and measures, particularly to replace the "open-access" fisheries with "limited-access" in order to balance the level of fishing efforts and the available fishery resources based on the Maximum Sustainable Yield (MSY) (**Annex 5**).

In conclusion, I would like to assure you that Thailand has established adaptive management programs that are efficient in preventing the deterioration of seahorse resources by fishing activities, facilitate monitoring of trade of *Hippocampus* spp., and reviewing of relevant management measures to ensure that trade would not become detrimental to the survival of the species in the wild; as well as compliance with Article IV, paragraphs 2(a), 3 and 6(a) of the CITES Convention.

Yours sincerely,


(Mr. Meesak Pakdeekong)

Deputy director-General
in the Gulf of Thailand
For Director-General

Enclosed:

- Annex 1: Areas with high density of seahorses in the Gulf of Thailand
- Annex 2: Areas with high density of seahorses along the Andaman coast
- Annex 3: Notification of the Ministry of Agriculture and Cooperatives
- Annex 4: Monitoring program of seahorse landings
- Annex 5: The Royal Ordinance on Fisheries B.E. 2558 (2015)

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Project I.D.
0002/1306

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PROGRESS REPORT SUBMISSION FORM

Please type or print in English

RESEARCH PROJECT TITLE:

Implementing CITES for Seahorses in Thailand

1. Name:

Principle Investigator – Dr. Amanda Vincent

Research team:

- a) Ting Chun-Kuo
- b) Tse-Lynn Loh
- c) Lindsay Aylesworth
- d) Sarah Foster

2. Foreign researcher registration no.:

Principle Investigator – Dr. Amanda Vincent – 37/56

Research team:

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List of collaborating Thai researchers and/or Thai Institutions:

Primary collaborating Thai researchers and institutions:

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Ratanawalee Phoosawat, CITES SA, Department of Fisheries
Yoo-ee Getpech, CITES MA, Department of Fisheries
Patrichart Laksanawimol, PhD Candidate, Department of Marine Science, Faculty of Fisheries, Kasetsart University

Additional collaborating Thai researchers and/or Thai Institutions:

- Andaman Sea Fisheries Research and Development Center of Phuket – field logistics, port logistics and seahorse buyers in Phuket
- Chumphon Provincial Marine Fisheries Station - logistics for port interviews in Chumphon and a collaborative day in January
- Phang-nga Provincial Marine Fisheries Station - provided staff and logistical support for research in Koh Kloi, Tablameau, Koh Mook and Koh Lanta, including collaborative research days in Koh Mook and Koh Lanta.
- Phuket Aquarium - Aquarium seahorse breeding situation introduction
- Samut Prakan Provincial Marine Fisheries Station - logistics for port interviews and seahorse buyers in Prachuap Khiri Khan and a collaborative day in January
- Satun Provincial Marine Fisheries Station - logistics for port sampling and interviews in Kantang, Satun and Koh Sarai, including a collaborative day of research on Koh Sarai in June.
- Siam Ocean World - Aquarium seahorse breeding situation introduction
- Department of Fisheries Geospatial Analysis Department – capacity building for seahorse observation maps and temporary access to national park shapefiles and Thai bathymetry data.
- New Heaven Reef Conservation Program (Koh Tao) and Dive Tribe Thailand (Pattaya) –iSeahorse collaborators.

Funders:

Field research and staff were co-funded by: Guylian Chocolates, Belgium; John G. Shedd Aquarium, Chicago; People’s Trust for Endangered Species; Ocean Park Conservation Foundation Hong Kong; Bottom Billion Fieldwork Fund; FBR Capital Investments; Riverbanks Zoo and Garden Conservation Support Fund; SciFund Challenge; The Explorer's Club Exploration Fund

Report pre-amble:

This report to NRCT for the research project entitled “Implementing CITES for Seahorses in Thailand” is intended to summarize the activities and results for roughly the second six months of the two year project. It is being submitted by Project Seahorse, but represents the collaborative efforts of Project Seahorse and the Thai Department of Fisheries.

There were four main research activities in support of our collaboration:

- Research activity A: Trade research
- Research activity B: Rapid assessment protocol (RAP) of Thai seahorse populations
- Research activity C: Seahorse life history research
- Research activity D: Seahorse population status under human pressure

For clarity's sake, we have broken the report into three sections based on these activities – we report on each of activities A and B separately, but combine activities C and D into one section as they are highly complementary.

Second report to NRCT on Research activity A: Trade research

a collaboration between Project Seahorse (The University of British Columbia)
and the Thai Department of Fisheries

Objectives of research as stated in proposal to NRCT:

The objective of trade research is to generate and share new knowledge about seahorse biology, fisheries and trade that might affect implementation of the CITES Appendix II listing for Thai species.

Update on activity:

As reported in our 6 months progress report to NRCT (submitted August 2013), our trade research in support of Activity A managed to obtain novel information from a good number of fishers and primary buyers in Thailand. However we were unable to interview a sufficient number of upper level traders, especially exporters and wholesalers. It is important we obtain these data to complete the picture of seahorse trade in Thailand.

To resolve the issue, Project Seahorse found additional funding and contracted Dr. Parichart Laksanawimol, Thai seahorse expert based at Chandrakasem Rajabhat University, to fill this important data gap with further interviews at upper levels of the trade.

Dr. Laksanawimol will execute surveys of upper level traders, wholesalers and exporters of seahorses in Bangkok and surrounding regions. She will gather information on seahorse biology, volumes, values (at different trade levels), uses (domestic and international), trade structure, trade routes, and seasonality of the trade in Thailand. She will also probe temporal trends and geographic differences in these parameters. Information will come from (a) interviewing a wide array of participants in trade, and (b) measuring seahorses in trade.

Dr. Laksanawimol will submit her final report to Project Seahorse mid-April 2014. The results of her research will then be combined with those already obtained during earlier trade surveys to complete our analysis and report to CITES Thailand. We also expect to publish the complete results of the trade research in a primary journal.

Second report to NRCT on Research activity B: Rapid assessment protocol (RAP)

a collaboration between Project Seahorse (The University of British Columbia)
and the Thai Department of Fisheries

Objectives of research as stated in proposal to NRCT:

We need to conduct rapid in-water surveys to obtain essential information on seahorse distribution, density, sex ratio, size distribution and habitat preferences throughout Thailand. We will then (i) map seahorse distribution, identifying high density areas, to support CITES recommendation e, and ii) prepare a status report for seahorse populations, their locations, and types of habitats they depend on in support of CITES recommendations.

Introduction

Seahorses (*Hippocampus* spp.) are featured heavily in global wildlife trade both as dried (traditional medicines or curios) and live (aquaria) specimens (Vincent et al. 2011). This trade provides valuable cash flow to low-income communities, especially subsistence fishers in developing countries (Vincent 1996, Vincent et al. 2007). The seahorse trade for traditional medicine is particularly significant in Southeast Asia (Choo and Liew 2005, Giles et al. 2006, Perry et al. 2010, Vincent et al. 2011), with tens of millions of dried seahorse exported annually (Vincent et al. 2011). The main source of dried seahorses is trawl bycatch (Baum and Vincent 2005, Giles et al. 2006, Perry et al. 2010), while live animals are specifically targeted for capture (Rosa et al. 2006, Perry et al. 2010).

Since seahorses are slow-moving, have limited home-ranges, exhibit mate-fidelity and have low fecundity relative to other fish species, they are prone to overfishing (Foster and Vincent 2004), and the current harvest rates of seahorses are of great concern (Vincent et al. 2011). In addition, seahorses are sensitive to habitat degradation caused by trawling on soft-bottom environments, dynamiting of coral reefs, and other destructive capture methods (Duarte 2002, Marcus et al. 2007), further impeding population recovery. However, the geographic range, population size and habitat preferences for many species are still unknown, making it difficult to assess population impacts and manage trade. At present, there are 14 recognized seahorse species in Southeast Asia (Lourie et al. 2004), and six of these are listed as “Data Deficient” on the IUCN Red List.

All seahorses are listed on CITES Appendix II, requiring the 175 signatory nations (Parties) to cooperate on seahorse conservation. CITES official data indicate that Thailand is the principal source of seahorses for trade, exporting an average of five million individuals per year (UNEP-WCMC, 2013). A lack of basic information on distribution, habitat and abundance means that the sustainability of this exploitation cannot be assessed. Given the scale of its exports – and Thailand’s challenges in regulating them – the CITES Animals Committee has deemed Thailand’s trade in several seahorse species to be of “Urgent Concern”, and suggested action that might help Thailand fully implement the Convention for three species of seahorses. One of these recommendations was to “undertake studies to provide evidence on variation in the spatial and temporal abundance of the three species of *Hippocampus* to enable areas of high seahorse density to be identified... as the basis for considering area restrictions on nonselective fishing gear that obtains *Hippocampus* species as bycatch”.

The aim of this project was to support Thailand to meet this recommendation by documenting seahorse distribution, variation in spatial abundance and habitat preferences in Thailand, to enable areas of high seahorse density, or hotspots, to be identified as the basis for considering spatial management opportunities. Mapping these hotspots onto the distribution of Thailand's MPAs and other spatial management will allow us to understand what protection such measures provide for Thai seahorses, and what additional area restrictions are needed in support of seahorse management and conservation. The results from this mapping exercise will also inform priority areas for further monitoring and conservation action.

Our initial efforts towards this aim were carried out from February to April 2013, and involved searching for seahorses along the Andaman coast of Thailand using random belts transects. Only eight seahorses were sighted at 14 sites in spite of a huge survey effort; we surveyed a minimum total area of 1000 m² and a maximum total area of 2000 m², per site (Project Seahorse and DoF, 2013). It became apparent that surveys restricted to areas defined by transects were not conducive to finding seahorses, which are typically found in low densities or rare, have patchy distributions, and are highly camouflaged. We instead needed a survey method that is flexible enough to increase the chances of spotting seahorses underwater, yet rigorous enough for spatial and temporal comparisons. As such, a novel methodology was developed for the citizen science program iSeahorse, as part of a comprehensive monitoring toolkit for wild populations of seahorses, iSeahorse Trends.

With this new survey methodology, our focus turned once again to finding seahorse hotspots. Mapping these hotspots onto the distribution of Thailand's MPAs and other spatial management will allow us to understand what protection such measures provide for Thai seahorses, and what additional area restrictions are needed in support of seahorse management and conservation. The results from this mapping exercise can be applied to assess the sustainability of seahorse trade from Thailand, and will feed into an adaptive management framework for seahorses. The objectives of our second field season, carried out from September to October 2013 and primarily focused in the Gulf of Thailand and around Phuket, were to:

- Identify and ground-truth seahorse hotspots in Thailand
- Characterize seahorse populations at hotspots

Materials and Methods

Finding seahorse hotspots

Prior to heading to the field we made a concerted effort to extract seahorse sightings from all available sources of information including but not limited to internet resources, popular media, survey reports and published articles. An appeal to report seahorse sightings and localities around Thailand was also made through mass emails, list-servs, social media (Facebook and Twitter) and direct contact with scuba divers and local dive shops. The appeal for sightings was also translated and posted on Thai online forums where local scuba divers interact.

Field Surveys - hotspot identification and ground-truthing

Seahorse surveys were based on methods developed for the iSeahorse Trends toolkit for underwater surveys. Survey sites were selected based on information gathered through email and social media outreach, and from anecdotal information obtained on site visits. Instead of searching a fixed transect area, a random swim, or survey "run", was conducted for each scuba dive or snorkeling session. Surveyors searched for seahorses during a run and recorded distance traveled and total active search time. When seahorses were encountered, characteristics such as sex, reproductive state, torso length

and habitat type were recorded. Only seahorses found outside of national parks were handled to obtain measurements. One to three runs were conducted at each survey site, and 250-300ml of seawater was collected at survey depth at each site for water quality analysis. From September to October 2013, a total of 44 sites were surveyed at the following locations- Ko Tao (Surat Thani), Ban Tong Tom (Chumphon), Laem Por (Surat Thani), Khanom (Nakhon Si Thammarat), Ao Nang (Krabi), Thung Walen (Chumphon), Ao Por (Phuket), Pattaya (Chonburi), Samaesan (Chonburi) and Ko Kood (Trat) (Figure B1). The survey team primarily consisted of the principal investigator (T-L Loh) and experienced field assistants. At Ko Tao, the team was assisted by staff of the New Heaven Conservation Reef Program, who teaches and runs seahorse monitoring surveys. A senior aquarist from Shedd Aquarium assisted with fieldwork at Ko Tao, Ban Tong Tom, Laem Por, Khanom and Ao Nang, and dive guides helped with finding seahorses on surveys conducted at Ao Nang, Pattaya and Ko Kood.

Informal interviews

With the help of local research assistants, we spoke with 35 people, including fishers, boat captains and crew, dive guides, villagers and officers from the Rayong office of the Department of Fisheries to try and determine where seahorse populations could be found. When applicable, we also requested examinations of dried seahorse collections to assess the species caught in the area, the average sizes of seahorses caught and the relative proportions of each species in the collection. Questions varied by person but usually included asking about catch or sighting per unit effort, fishing grounds, seasonal sightings of seahorses and estimations of changes to seahorse populations over the last decade.

Results

Finding seahorse hotspots

From the information gathered through email blasts and social media outreach, the following locations were identified as locations where seahorses were frequently spotted by divers- Pattaya and the surrounding area, the local islands off Ao Nang, the local islands off Phuket and Ko Tao. Respondents also suggested areas of interest such as a homestay in Chumphon province, Tong Tom Yai Homestay, which attracts visitors to view the seahorses living under the homestay building.

Field Surveys - hotspot identification and ground-truthing

From the surveys, seahorses were found at six of the ten survey locations- Ko Tao, Ao Nang, Pattaya, Samaesan and Ko Kood, and 15 of the 44 survey sites (Figure B1). Further details by site are found in Table B1.



Figure B1. Map of seahorse survey sites. Seahorses were observed at sites labeled green, and none were observed at sites labeled red. The numbers on the labels correspond to site numbers in Table B1.

Table B1. Summary of field surveys to identify and ground-truth potential seahorse hotspots. The average individual search time was multiplied by the number of surveyors for each run. Sites where surveyors snorkeled are highlighted in blue.

No.	Location	Site	No. of runs	No. of seahorses	Species	Dist. traveled/m	Search time/min	Habitat type	Depth range/m
1	Ko Tao	Mango Bay	3	1	<i>H. kuda</i>	255, 280, 230	180, 125, 148	Coral rubble, sand, silt	11-27
2		Ao Leuk	5	0	-	250, 250, 242, 242, 242	128, 180, 76, 114, 76	Sand	5-14
3		Hin Wong	3	0	-	142, 285, 280	108, 136, 196	Coral pinnacle, rock, sand	8-27
4		Twins	3	0	-	198, 198, 300	104, 128, 152	Coral rubble, sand	5-20
5	Ban Tong Tom	Tong Tom Yai Bay	1	0	-	200	200	Silt, sand, gorgonians	2-3
6	Laem Por	Phum Riang Bay	1	0	-	200	69	Sand with seaweed	3
7		Ko Sed	1	0	-	300	90	Sand with sponges	3
8		Mussel farm	1	0	-	150	120	Mussel poles on mud	3
9	Khanom	Ao Thong Node	1	0	-	500	330	Rock, patchy coral	2-3
10		Ko Tha Rai	3	0	-	70, 200, 200	330	Seagrass	0-2
11	Ao Nang	Ko Mae Urai	1	7	<i>H. comes, H. kuda</i>	250	148	Coral reef	9-17
12		Ko Yawasam	1	1	<i>H. comes</i>	320	152	Coral reef	4-15
13		Ko Ha	1	0	-	250	256	Coral reef	10-15
14		Ko Kom	1	2	<i>H. comes</i>	330	192	Coral reef	8-10

15		Ko See	1	0	-	310	216	Coral reef	6-8
16		Ko Tang	1	1	<i>H. comes</i>	280	144	Sand, rock	4-13
17		Ming Ko Tup	1	0	-	400	156	Sand, silt, shallow reef	3.5-14
18	Thung Walen	Ko Lak	1	0	-	280	78	Pinnacle	20
19		Ngam Ko Ngam	1	0	-	380	56	Sand, pinnacle	13-22
20		Noi Ko Keh	1	0	-	200	60	Sand, patchy coral, rock	2-3
21	Ao Por	Ao Por 1	2	0	-	100, 150	96, 26	Seagrass, silt	1.5-2.5
22		Ao Por 2	2	1	<i>H. comes</i>	100, 250	92, 34	Sand, rock, patchy coral	1.5-8.5
23	Pattaya	Ko Pai	1	11	<i>H. spinosissimus</i>	150	87	Sand, some bivalves	7-11.5
24		Ko Sak	1	2	<i>H. spinosissimus</i>	50	150	Artificial reef (concrete)	7-11
25		Khram Wreck	1	0	-	170	69	Shipwreck with sand/shell bottom	27-28
26		Ko Sak East	1	1	<i>H. spinosissimus</i>	250	183	Sand	5-11
27		Ko Klung Bedan	1	3	<i>H. spinosissimus</i>	300	171	Sand, rubble, shell	4-11
28		Ko Rin	1	0	-	100	159	Patchy coral, rock, sand	2.5-13
29		North Rock	1	0	-	300	156	Coral reef	4-19
30		Ko Lan	2	16	<i>H.</i>	65, 120	119, 99	Artificial reef	12-16.5

					<i>spinosissimus</i>			(concrete)	
31	Samaesan	Hardeep Wreck	1	0	-	200	32	Shipwreck, sand bottom	24-27
32		Ko Chan	1	1	<i>H. spinosissimus</i>	400	66	Silt	10-24
33		Ko Chan N	1	1	<i>H. spinosissimus</i>	550	58	Sand	5-22
34	Ko Kood	Ban Bao	6	2	<i>H. spinosissimus</i>	350, 350, 350, 250, 250, 250	65, 65, 65, 34, 34, 34	Sand	1.5-7.5
35		Hat Khlong Chao	1	0	-	80	69	Silt	18-20
36		Khlong Chao shallow	3	0	-	300, 300, 300	38, 38, 38	Sand	3-7.5
37		Ao Ta Kien	1	1	<i>H. spinosissimus</i>	150	186	Rubble	9-13
38		Ao Lang Aurn	1	0	-	300	123	Sand, patchy coral	7.5-9
39		Ko Maisi	1	0	-	200	117	Sand, small rocks	4-8
40		Ko Raed	1	0	-	100	168	Fish cages, shallow reef, sand	2-5
41		Artificial reef	1	0	-	80	69	Artificial reef (concrete)	17
42		Ao Khluai	1	0	-	400	261	Sand, rubble	10
43		Ao Jak	1	0	-	150	165	Sand, silt	4-8
44		Ao Yoi	1	0	-	200	135	Sand, silt	3-9

Three seahorse species were recorded in this survey series- *H. comes*, *H. kuda* and *H. spinosissimus*. *Hippocampus comes* was only found on coral reefs along the Andaman coast, at Phuket and Ao Nang, *H. spinosissimus* was only recorded within the Gulf of Thailand, on sand, silt and rubble, and *H. kuda* can be found along both coasts in reef and sandy habitats. The mean torso length of adult *H. spinosissimus* was 47.8 ± 3.3 (SE) mm (n=28), and 11.7 ± 0.4 mm for juveniles (n=8). Individuals of *H. comes* and *H. kuda* were all found within the Hat Noppharathara National Park, except for one *H. comes* at Phuket, which had a height of 120mm. One of the ten *H. comes* observed was a juvenile, and no juveniles were recorded for *H. kuda* (n=3). Of the adult seahorses, the female to male sex ratio for *H. comes*, *H. kuda* and *H. spinosissimus* was 4:5, 2:1 and 21:7 respectively. Ten of the 13 male seahorses encountered were pregnant, and many pregnant males were found in close proximity to a female seahorse.

Informal interviews

From informal interviews, seahorses can also be found at Ban Tong Tom, Laem Por and Khanom, despite not encountering any in our surveys. Dried individuals of *H. trimaculatus* were common in dried seahorse stockpiles at Laem Por and Ko Kood, with a few individuals of *H. spinosissimus* (usually ~10%). According to a boat captain at Bang Saray, Chumphon Province (n=1), the trawling boats frequently catch *H. trimaculatus* at 30-40m around Ko Rin, off Pattaya. The boats that land at Samaesan pier trawl from Prachuap Khiri Khan to Samaesan, and a boat captain (n=1) estimated catching 20-30 seahorses every two weeks from an average trawl depth of 25m. Villagers at Ban Tong Tom (n=6) and Laem Por (n=12) reported catching individuals of *H. kuda* prior to our arrival on site. Small-scale fishers (n=2) reported that they used to release seahorses if accidentally caught in fishing gear such as gill nets, but as the price of seahorses has increased, some fishers now keep seahorses from bycatch to sell to brokers. Most of the interviewees (n=32/35) thought that seahorse populations in their area had declined over the past ten years. The owner of a gift shop at Fossil Beach, Ao Nang, said that she does not sell many souvenirs made from seahorses these days as seahorses are hard to find now. Overall, reported estimates of seahorse declines range from 50-90% (n=32), with only three of the 35 respondents (all fishers) indicating that there were no population declines over the past decade.

A few respondents reported that trawling takes place within the 3 km trawling exclusion zone. Small-scale fishers, villagers and dive professionals from Ban Tong Tom (n=1), Thung Walen (n=2), Ao Nang (n=1), Laem Por, Khanom (n=1) and Ban Laem Prathap, Khanom (n=1) reported that bottom trawling occurs within 1 km of the shore, with trawl boats coming from other provinces. Aside from removing fish stocks, interviewees were concerned that bottom trawling would damage the shallow habitats. The dive guides from Chumphon Cabana at Thung Walen (n=2) mentioned that trawl nets can be found in protected areas such as within the Mu Ko Chumphon National Park. On the topic of enforcement, interviewees perceived that there are not enough officers in the area to arrest the crew of boats trawling within the exclusion zone, and that trained volunteers are needed as well. Besides seahorses, respondents from Ban Laem Prathap (n=3) and Ko Kood (n=2) indicated that populations of other fish species have declined. In Ban Laem Prathap, the three villagers interviewed reported switching from fishing to agriculture and tourism, and on Ko Kood, the two trawler fishers interviewed now catch small fish for animal feed instead of food fish for human consumption.

Discussion

The results of this study contribute to our understanding of seahorse distributions along the coasts of Thailand. From the results of our surveys and interviews, two species of interest in trade- *H. kuda* and

H. spinosissimus, can be found along both the Andaman coast and in the Gulf of Thailand. *Hippocampus trimaculatus* was never encountered in-water during surveys, but appeared to be frequently netted as bycatch by trawlers operating in waters deeper than 25m. The tiger tail seahorse, *H. comes*, was only observed along the Andaman, at Ao Nang and off Phuket. The survey sites Ko Lak Ngam and Ko Ngam Noi off Thung Walen, and off Khanom and Ao Nang were within National Parks, however, seahorses were only found off Ao Nang. The waters around Ko Tao are now part of a newly designated marine protected area administered by the local community, with zoning regulations and restricted fishing.

In line with our survey findings from February to April 2013, *H. comes* appears to be associated with reef habitats, while *H. kuda* can be found in a variety of habitats including coral reefs, mangroves and sandy bottoms. From our surveys, *H. spinosissimus* is not usually associated with coral areas, and is found more frequently in sandy, silty, or rubble habitats. At sites off Pattaya, *H. spinosissimus* commonly uses pencil urchins as a holdfast.

The highest abundance of seahorses was found at an artificial reef off Ko Lan, Pattaya, with a total of 16 seahorses, or 8.6 seahorses/100m surveyed. Seahorses were also common at Ko Pai, Pattaya (7.3 seahorses/100m) and Ko Mae Urai, Ao Nang (2.8 seahorses/100m). The outer islands off Pattaya including Ko Pai are part of a marine protected area regulated by the Thai Royal Navy. Ko Lan and Ko Sak are considered part of the inner islands near Pattaya, which are not within a marine protected area, however, they fall within the commercial fishing exclusion zone that covers the entire coastline of Thailand. Ko Lan is also heavily visited by tourists year-round, which may deter fishing activity in the area. It was heartening to note that most of the male seahorses found were pregnant, especially at Ko Lan, indicating that this site may be an important source of seahorse recruits.

While Thailand has several measures already in place to regulate fishing pressure and designate no-take zones, it is clear from our conversations with local community members that enforcement of these regulations may be an issue. Several people reported incidences of illegal trawling activity within 3km of the shoreline, which intersects with shallow seahorse habitats. We also do not know the impacts of trawling deeper waters on populations of species such as *H. trimaculatus* and *H. kelloggi*. Information from these surveys and informal interviews need to be integrated with data from fisher interviews and port sampling for a fuller understanding of seahorse distribution and threats in Thailand.

The identification of a few seahorse hotspots in Thailand is useful, but there is still a need to improve the spatial analysis of seahorse presence in Thailand, starting with the proportion of potential habitat occupied by seahorses. This may be addressed by an occupancy study to determine how often seahorses occupy different habitat types will be carried out by Project Seahorse and DoF in 2014 along both the Andaman and Gulf coasts. iSeahorse, the citizen science site for seahorses (www.iSeahorse.org), can also provide valuable information on seahorse distribution, especially from visitors to National Parks. Additional independent trawl surveys can help to determine seahorse location and species composition in deep offshore areas as well.

In the meantime, decision makers in Thailand could consider protecting known seahorse hotspots such as Pattaya from future fishing efforts. This could be achieved by establishing and maintaining relationships with local stakeholders such as conservation groups and dive shops to collaboratively manage the seahorse areas. These community groups can then act as local monitors or enforcement agents to continue collecting data on seahorse populations, and ensure the longevity of the populations in the area.

Second report to NRCT on research activities C and D: Seahorse life history research and Population status under human pressure

a collaboration between Project Seahorse (The University of British Columbia)
and the Thai Department of Fisheries

Objectives of research as stated in proposal to NRCT:

C. Life history research – The objective of the life history research is to determine critical parameters needed to model seahorse population responses to exploitation pressures – and thus to improve management measures.

D. Population status under human pressure – The objective of this research is to determine how seahorse populations are faring under different human pressures (e.g. trawling and other fishing pressures). Building population models that examine the outcomes of management modification for particular species in full support of the CITES recommendations requires an understanding of: i) the extent of human pressure acting on the marine environment in Thailand; ii) seahorse population response to human pressures; iii) seahorse life history responses to human pressures; and iv) seahorse habitat responses to human pressures.

Research Methodology:

We originally chose the Andaman coast of Thailand as the focal area for research activities C and D to complement existing research on seahorses in Thailand. Research carried out by Parichart Laksanawimol, PhD student at Kasetsart University, has generated novel information on *H. kuda* and *H. spinosissimus* in the eastern Gulf of Thailand. However information on *H. kelloggi* in Thailand, or indeed elsewhere in its range, is nonexistent. We therefore decided to prioritize this species for our research – and enumerator surveys conducted by the Thai Department of Fisheries (DoF) indicated the majority of *H. kelloggi* are caught on the Andaman coast. In addition to information on *H. kelloggi*, we will be able to gather new information on the two other seahorse species – *H. kuda* and *H. spinosissimus*, which may reveal important geographical patterns in their life history and ecology (when compared to the Gulf).

However, our first round of research activities in Thailand found few wild seahorse populations along the Andaman coast (see report on activity B). As a result we have added several research sites along the central and northern Gulf Coasts to our sampling for life history research (activity C). These new sites are based off the results of the Gulf rapid assessment research (activity B), and reports of repeated sightings of *H. kuda* and *H. spinosissimus* from divers on www.iSeahorse.org – a citizen science venture for seahorses. Including these sites should help to ensure we have sufficient sample sizes to generate life history estimates.

C. Life history research

Information on the life history of Thai seahorses will be obtained from both underwater and fisheries sampling. Our activities thus far have focused on the latter of these approaches, with underwater sampling set to start in February 2014 on the Andaman Coast and May 2014 in the central and northern Gulf of Thailand.

By sampling at landing sites from May-August 2013, we documented fishers' seahorse catches. This research approach is used to gather information on seahorse biology, ecology, and seasonality of seahorses in Thailand. By interviewing fishers we have collected information on species, size, sex, reproductive status and distribution of seahorses, before they were returned to the fishers to handle as they would normally (i.e. retain or discard).

Initial life history analysis was performed by generating the following descriptive information per species - the total number of individuals, average height, smallest pregnant male as determined by the presence of a fully developed brood pouch on the male's tail, total number of pregnant males, total number of juveniles, and sex ratio.

D. Population status under human pressure

Research started in late May 2013 to understand the extent of human pressure acting on the marine environment in Thailand, and how seahorses are faring under this pressure. The information needed for this research was collected during the same interviews used to sample for life history information, Activity C. Fishers from both commercial and small-scale fisheries participated in semi-structured interviews and participatory mapping to answer general questions about their behavior, fishing grounds, and areas of high seahorse bycatch. The interviews are designed to highlight fishers' decisions about location, frequency, gear type and duration of fishing, while mapping allows for spatial representation of fishing pressure and effort in the coastal seascape. Additionally during port sampling information was gathered on methods of extraction (e.g. target/incidental), catch per unit effort, and seasonality of seahorse catches in Thailand.

To date our participatory mapping with fishers has yielded two types of maps. The first identifies spatial extent of fishing effort by commercial and small-scale fishers on the Andaman Coast. Fishers were asked to map their fishing grounds on a computer tablet. Information on depth of fishing activities, and geographical reference points were recorded for each fishing ground to edit maps for accuracy based on these constraints. The second set of maps, identify reported areas of seahorse occurrence as reported by fishers (interviewed during activity C) and divers (as part of activity B). Some fishers identified seahorses by species or provided dried specimens; others identified seahorses as either smooth or spiny but generally reported size or depth ranges. These general descriptions of seahorses were included in species maps based on morphological characteristics, and / or known size or depth ranges for *H. kelloggi*, *H. kuda* and *H. spinosissimus*.

To date maps have been made with raw-data only, meaning that spatial extent of fishing grounds and location of seahorse occurrences have yet to be edited by depth or geographical reference points. Therefore the results of these maps should be interpreted with caution. These maps were created in ArcGIS 9.1.

Research results to date:

C. Life history

Between May and August 2013, we interviewed 175 fishers at ports and in fishing villages in Phuket, Phang-nga, Krabi, Ranong, Trang, and Satun provinces. During this time we recorded species information from a total of 256 individual seahorses, but were only able to measure 231 individuals for life history characteristics. The vast majority of these seahorses (n = 189) were sampled from trawl catches, with 36 seahorses sampled from gillnets, five from purse seiners, and one from a compressor

diving fisher. Six of the seven species found in Thailand are represented in these fisheries catches, with the majority of individuals from *H. spinosissimus*, *H. kelloggi* and *H. trimaculatus* (Table C1).

Table C1. Initial analysis of life history data from six *Hippocampus* species sampled at landing sites along the Andaman Coast. Results include the total number of sampled individuals, average height of individuals in centimeters, previously estimated size at first maturity, height of smallest pregnant male, total number of pregnant males, number of juveniles and sampled sex ratio. *For *Hippocampus trimaculatus*, an additional 25 individuals were observed and identified to the species level, but we were unable to record additional life history information.

Species	<i>H. comes</i>	<i>H. histrix</i>	<i>H. kelloggi</i>	<i>H. kuda</i>	<i>H. spinosissimus</i>	<i>H. trimaculatus</i>
No. of individuals	6	2	65	2	67	89*
Average height (cm)	14.2	11.3	17.5	15.8	12.9	11.9
Estimated sizes at first maturity (previous studies)	8.1 ¹	7.9 ¹	15.0 ¹	14.0 ¹	10.0 ²	9.1 ²
Smallest pregnant male (cm, this study)	16.7	10.2	15.2	N/A	11.2	7.5
Total no. pregnant males	2	1	17	0	13	20
No. of juveniles	0	0	8	0	7	16
M: F ratio	1: 1	1:1	1:1.3	0: 2	1: 1.0	1:1.2

¹ Foster & Vincent 2004

² Lawson et al, Project Seahorse, unpublished data

Sex ratios were close to one to one for all species except for *H. kuda*, where both sampled individuals were female. We found the largest number of juveniles for *H. trimaculatus* but did not observe juveniles in our port sampling for *H. comes*, *H. histrix*, or *H. kuda*. The smallest pregnant males observed in this study were comparable in size to previously estimated sizes at first maturity for *H. kelloggi*, *H. spinosissimus* and *H. trimaculatus*. We still need to model population size at maturity with our samples to make a proper comparison to past research. Unfortunately, we can not yet model maturity for *H. comes*, *H. histrix* or *H. kuda* due to small samples sizes.

D. Population status under human pressure

We experienced a great deal of co-operation and interest from the fishers during interviews for this portion of our research. We conducted interviews in Krabi, Phuket, Phang-nga, Ranong, Satun and Trang provinces. Of the 175 fishers that have participated in the semi-structured interviews and participatory mapping: 44 worked on trawlers; 29 on purse seiners; and the rest (102) used a variety of small-scale fishing gears such as gillnets and cages (Table D1). Note that some fishers reported using more than one gear type and therefore totals by gear type do not equal the total number of fishers interviewed.

Table D1: The number of fishers interviewed by province and their reported types of fishing gear.

Gear Type	Trawl	Purse Seine	Gillnets	Cage	Other	Total Fishers Interviewed
Province	-----	-----	-----	-----	-----	-----
Krabi	0	5	13	12	0	23
Phang-nga	12	7	33	3	6	52
Phuket	13	10	11	5	8	40
Ranong	0	0	0	2	0	2
Satun	9	7	15	2	0	33
Trang	10	0	14	6	2	25
Total	44	29	86	30	16	175

Fishing Effort Maps

Interpreting the maps: The fishing effort map in Figure D1 is a draft map only. They have been edited for accuracy according to depth, but have not been crosschecked against fisher reported landmarks or travel times from shore. And critically, they have yet to be validated with the fishers themselves. The maps reflect the cumulative fishing effort reported by 73 commercial fishers and 102 small-scale fishers. **Additional editing of the maps must occur before they can be considered final.**

Small-scale fishers: Small-scale fishers (n=102) reported few areas along the coast that are fished only by small-scale fishers. The majority of these reported areas are in Phang-nga Bay and around several of the islands south of Koh Lanta. Small-scale fishers reported using the following gears: fish, crab, shrimp and stingray gillnets, crab cages, squid cages and squid light luring boats. Respondents also suggested that some small-scale fishers travel to nearby islands in Burma and Langkawi, Malaysia, to take advantage of fish stocks in these waters. Small-scale fishers reported fishing in waters as shallow as 1-2 m and as deep as 80 m (reported for crab cages); the shapefiles of small scale fishing effort have been edited to reflect these depths.

Commercial fishers: Commercial fishers (n=73) reported covering a large area of the Andaman Coast with their effort, including some international waters. It appears as though most of the areas reported to receive only commercial fishing effort are located quite far from the coast. Commercial fishers reported using purse seines, drop nets and trawls (both pair and otter). Several boats also reported fishing in waters off the coast of Indonesia or in international waters. Commercial fishers reported fishing as shallow as 10 m and as deep as 130 m; the shapefiles of commercial fishing effort have been edited to reflect these depths.

Small scale and commercial overlap: A large proportion of Thai waters on the Andaman Coast are reportedly fished by both small scale and commercial fishers. These areas of overlap extend all the way from Ranong to Satun and appear to include coastal and offshore waters. Consequently, these areas of spatial overlap may experience the highest levels of fishing effort. The depth ranges of these areas of overlap have yet to be assessed, but are not deeper than 80 m.

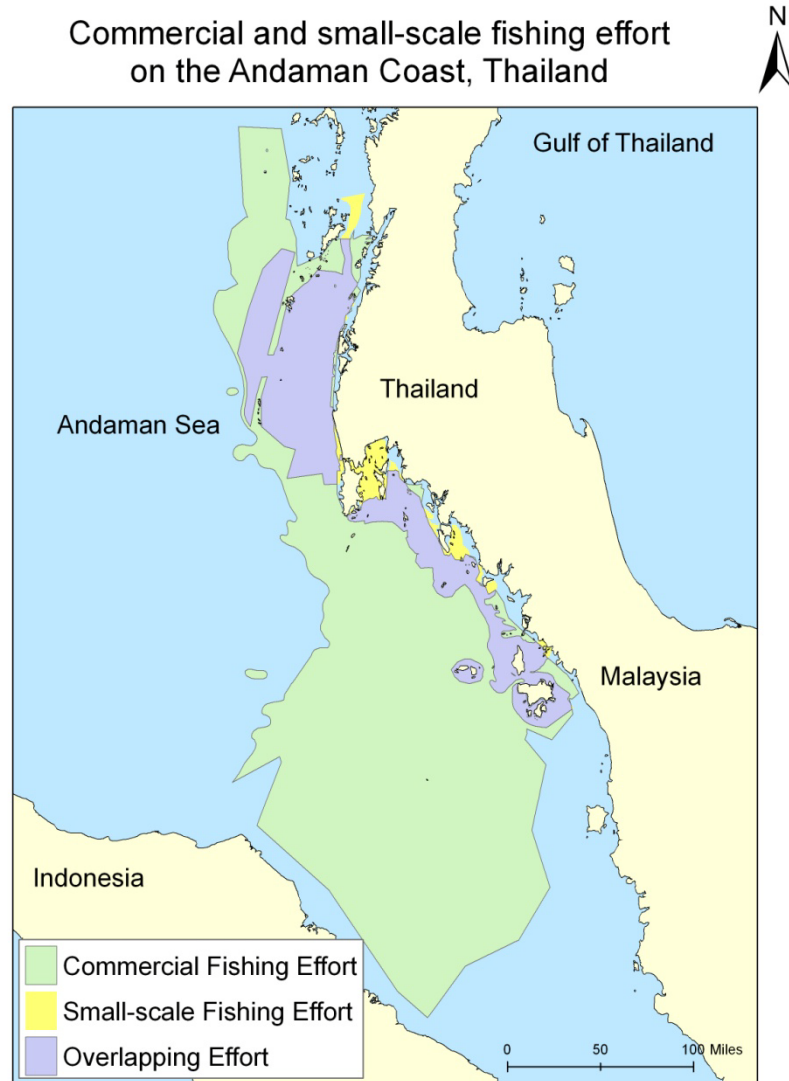


Figure D1. **DRAFT** map of reported distribution of fishing effort of commercial and small-scale fishers along the Andaman Coast of Thailand.

Seahorse Observation Maps

Interpreting the maps: The seahorse observation maps in Figures D2 through D5 are draft maps only. Seahorse locations on these maps were reported by fishers (interviewed during activity C) and divers (as part of activity B). Some fishers and divers identified seahorses by species or provided dried specimens, however others only identified seahorses as either smooth or spiny. All spiny seahorse reports were interpreted to mean *H. spinosissimus*, and all ‘smooth’ seahorses were interpreted to be *H. kelloggi*, *H. kuda* or *H. trimaculatus* based on reported morphological characteristics. The current maps have yet to be edited for accuracy according to reported and known species depth preferences. **These maps are not distribution maps for each species,** locations without observations do not necessarily reflect areas without seahorses due to biases from fishing, sampling or interview efforts. **Additional editing, including validation with stakeholders, must occur before maps can be considered final.**

***Hippocampus kelloggi*:** The majority of reports of *H. kelloggi* come from fishers (N = 182) (note some fishers reported *H. kelloggi* from more than one location and therefore sample size of reports is larger than number of fishers interviewed). The one diver observation came from the shallow waters off Kata Beach in Phuket. A photograph accompanied this observation and Dr. Parichart Laksanawimol confirmed the sighting. Fisher observations of *H. kelloggi* appear to be evenly reported along the Andaman Coast. Most of these observations were reported by trawlers (N = 147) and gillnet fishers (N = 35) to be from very deep waters (>40 m). *H. kelloggi* was reported more frequently than *H. kuda*, but less frequently than *H. spinosissimus* and *H. trimaculatus* along the Andaman Coast.

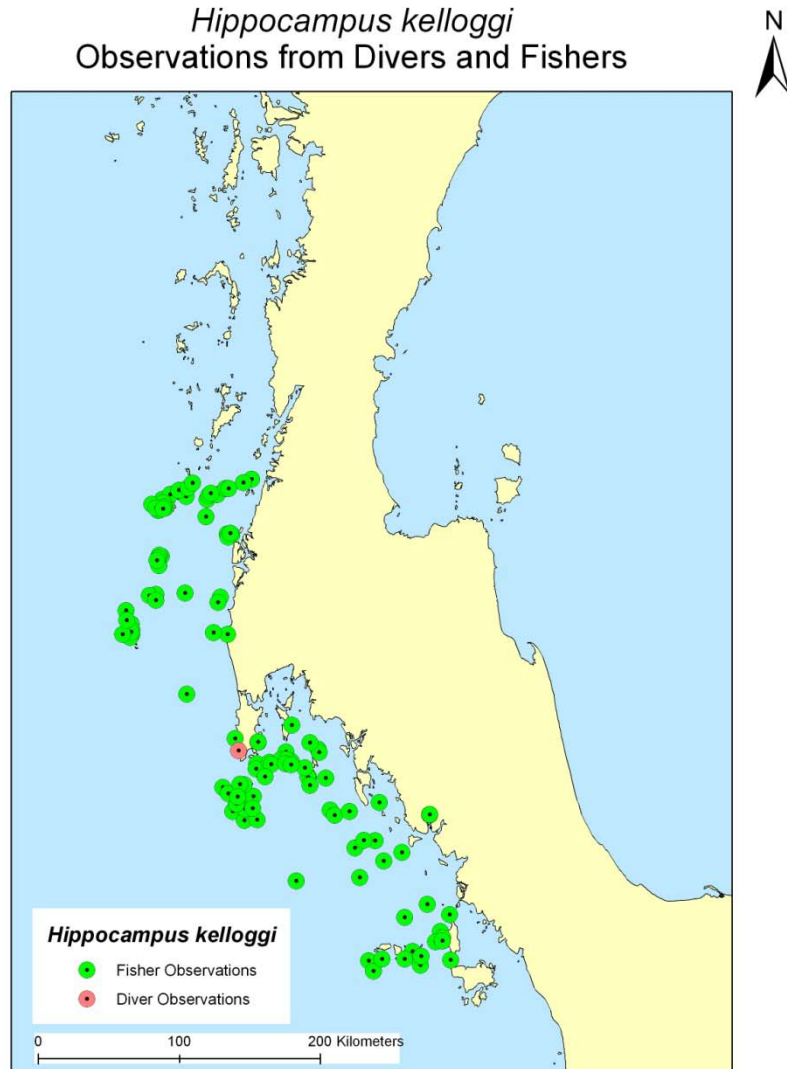


Figure D2. **DRAFT** map showing *Hippocampus kelloggi* observations from divers and fishers along the Andaman Coast of Thailand.

***Hippocampus kuda*:** Reports of *H. kuda* were for both the Andaman Coast and Gulf of Thailand. This is because the maps reflect reports by fishers (on the Andaman Coast, activity C) and by divers (on both the Andaman and Gulf Coasts, activity B). Fisher (N = 57) and diver (N=10) reports suggested that *H. kuda* is evenly distributed throughout the Andaman Coast. The only report from the Gulf of Thailand was from Koh Tao (N=2).

Diver observations of *H. kuda* were mostly from estuary areas. However several of the observations (Kata Beach and Koh Tao) were in shallow sandy bays. From diver reports, *H. kuda* was occasionally observed in habitat where other seahorse species were observed (*H. mohnikei*, *H. trimaculatus*, and *H. spinosissimus*). Few fisher observations specifically identified *H. kuda* but rather identified a smooth seahorse species, within known depth and size ranges of *H. kuda* and therefore were included in the map. *Hippocampus kuda* was the least reported seahorse by fishers along the Andaman Coast.

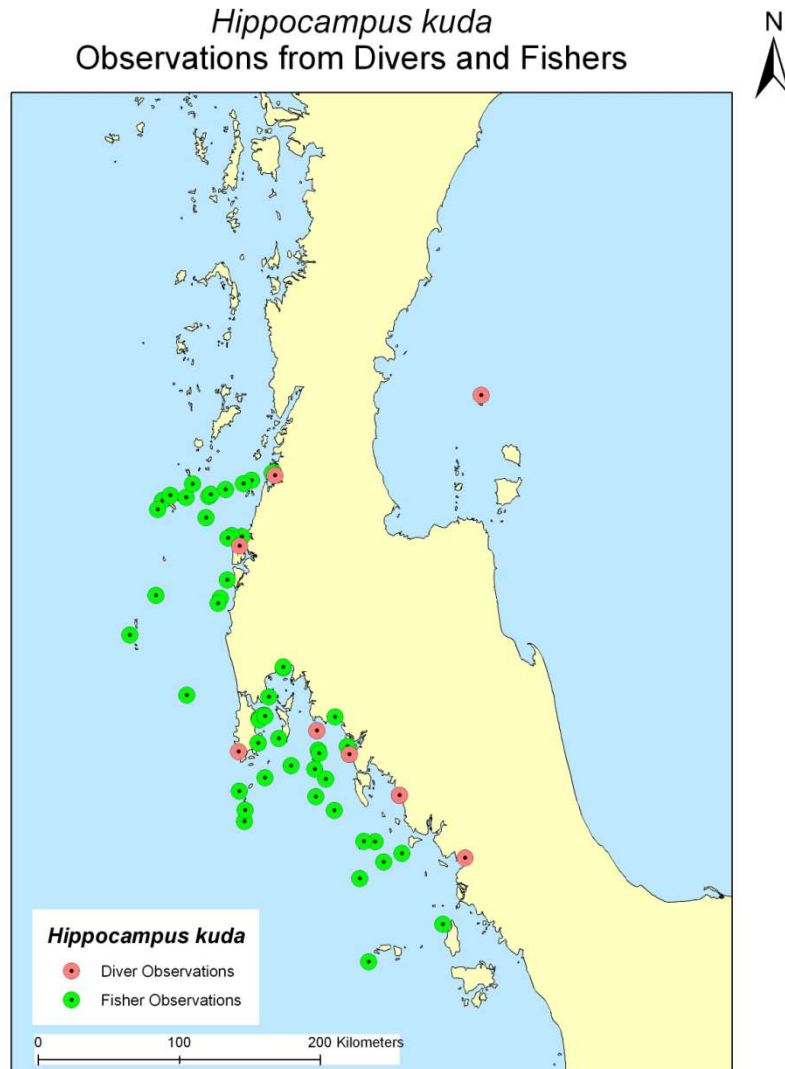


Figure D3. **DRAFT** map showing *Hippocampus kuda* observations from divers and fishers along the Andaman Coast of Thailand.

Hippocampus spinosissimus: The most diver observations of *Hippocampus spinosissimus* (N =33 out of 42) came from the rapid assessment surveys (activity B) around the islands off Pattaya. Along the Andaman Coast, several sightings of juvenile *H. spinosissimus* were observed in the shallow sandy bay off Kata Beach. Fisher observations (N= 271) of *Hippocampus spinosissimus* appear to be evenly distributed along the Andaman Coast.

H. spinosissimus was the second most reported seahorses by fishers along the Andaman Coast.

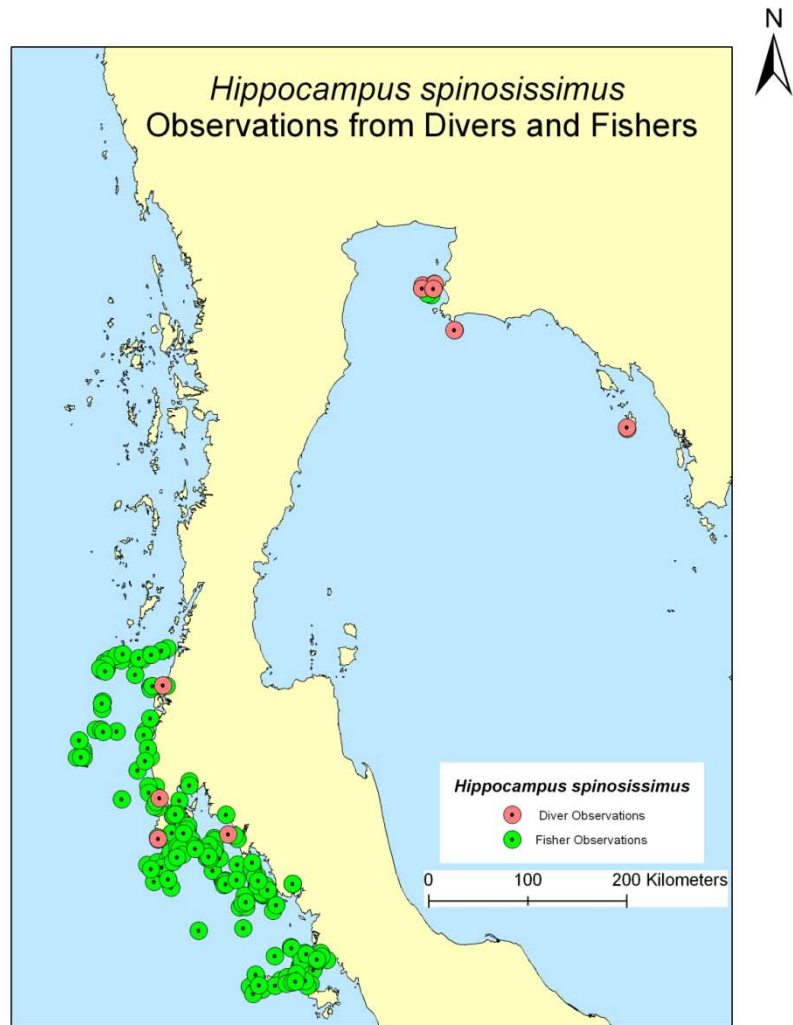


Figure D4. **DRAFT** map showing *Hippocampus spinosissimus* observations from divers and fishers along the Andaman Coast of Thailand.

***Hippocampus trimaculatus*:** Reports of *H. trimaculatus* appear to be evenly distributed along the Andaman Coast. The majority of observations of *H. trimaculatus* were reported from fishers (N=277). Diver observations (N = 13) on the Andaman coast are from sandy bays or rocky reefs. *H. trimaculatus* was the most reported seahorse species by fishers along the Andaman Coast.

Hippocampus trimaculatus
Observations from Divers and Fishers

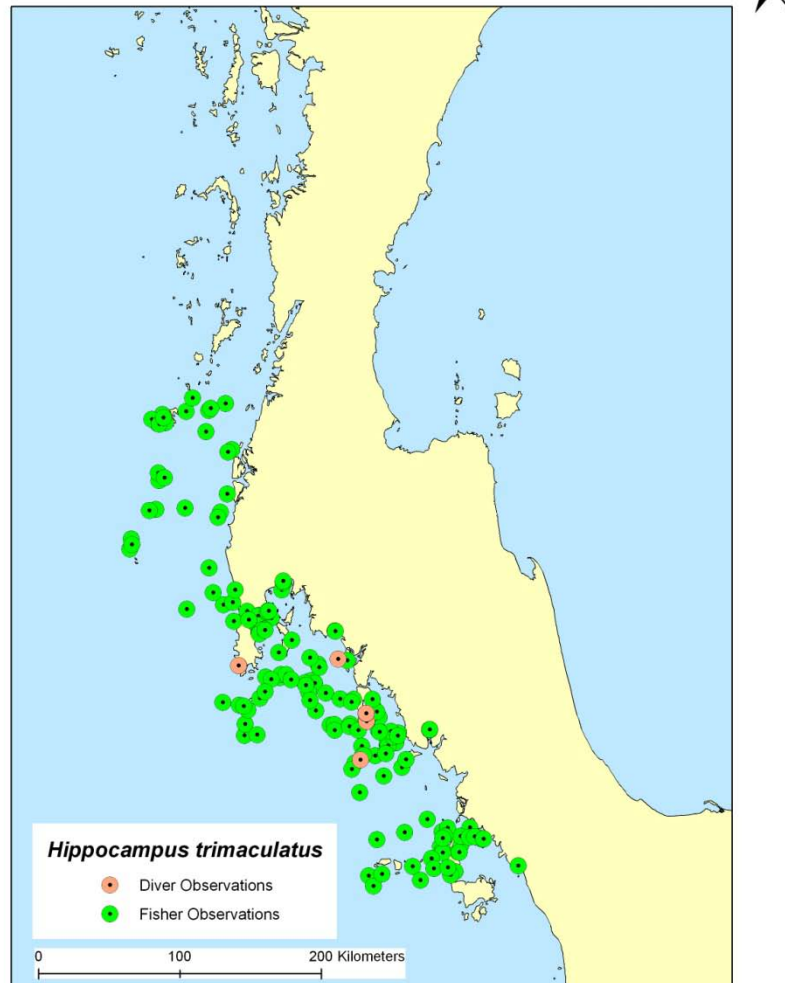


Figure D5. **DRAFT** map showing *Hippocampus trimaculatus* observations from divers and fishers along the Andaman Coast of Thailand.

Problems and Actions Taken:

C. Life History

We have yet to identify suitable research sites for the underwater portion of our life history work. We expected to determine these sites based on the results of the RAP (Activity B) – but as reported we found few seahorses.

To remedy this situation we are targeting areas of seahorse occurrence based on reports from fisher interviews and sightings data from Thailand’s recreational divers through our new citizen science initiative, www.iSeahorse.org (see maps above). This will target our efforts to areas with a higher probability of finding seahorses.

D. Population status under human pressure

We require access to the Thai bathymetry data, National Park shapefiles, and habitat data from our colleagues at the Department of Fisheries (DoF) to fully edit current data and maps. This is proving challenging due to restrictions on data sharing.

As a first step to overcoming this problem, in February a collaborative effort between Project Seahorse and the Thailand Department of Fisheries was undertaken to create maps reflecting current management measures that may affect seahorses. Working alongside the DoF Geospatial Department, current fisheries management measures such as trawl exclusion zones, seasonal closures, and National Parks areas were added onto the draft maps of seahorse presence. Several maps showing bathymetric data and seahorse observations were also created. Additionally the Department of Fisheries added in sightings from their deep-water trawl surveys to create more comprehensive maps. Once finalized these maps will assist Project Seahorse and DoF to evaluate seahorse population status under human pressure through the identification of areas where current management measures are providing adequate protection to seahorse populations.

The issue now is how to update the seahorse observation maps with new data as our access to bathymetric, National Park and habitat data was only temporary. We do hope a data sharing agreement can be reached that is suitable for all Parties.

Research Plan for the Next Period:

C. Life history

The next step is to sample seahorses underwater in representative sites along the Andaman and Gulf coasts. Comparing the life history traits of seahorses that are captured to those found underwater will allow us to deduce the selectivity and therefore potential impact of fisheries on wild seahorse populations in Thailand. If sample sizes remain low, we will explore the use of additional new datasets from outside Thailand (*e.g.* Malaysia) that if combined with our data, may be used to generate life history estimates.

We will strategically sample seahorses underwater for life history at sites identified by fishers and divers (seahorse observation maps, activity D). From this stakeholder-generated list, sites in National Parks, deeper than 25 m, and more than 5 km from shore were excluded based on permit requirements and accessibility. Eight sites from the remaining list were chosen for each coast because they met at least one of the following criteria:

- Recommended by both fishers and divers
- High frequency of reports by either fishers or divers
- Reports consistently from the site over the last 6 months
- Reports from key informants with years of knowledge & experience in the area

Additionally these research sites will be focused in areas with sandy soft bottom habitats. We chose to focus on this habitat for four reasons:

- Seahorses were reported most often by fishers on the Andaman Coast from sandy soft bottom habitats.
- Results from the Thai RAP (especially Gulf of Thailand) observed seahorses in sandy soft bottom habitats.

- Several reports from divers (some of which are on i-Seahorse) indicate that *H.kuda*, *H. spinosissimus* and *H. trimaculatus* have all been observed in sandy soft bottom habitats on both the Andaman and Gulf Coasts.
- Efforts from the rapid assessment on the Andaman Coast in 2013 did not focus on sandy soft bottom habitats, which may have contributed to the low numbers recorded.

Our strategic approach to future sampling will enable us to re-evaluate the results of the rapid assessment (activity B) and support the creation of a seahorse distribution map (activity D).

We will continue analysis on the port sampling data by seeking to generate size at maturity, size specific survival and individual growth rates. We will also seek to increase samples through collaboration with Dr. Parichart Laksanawimol. Additionally we may use simulations or bootstrap current data to generate more robust estimates for survival, growth and maturity.

D. Population status under human pressure

There are many research activities planned for activity D in the next period.

In order to better understand *the extent of human pressure acting on the marine environment in Thailand*, we will perform the following activities:

- Continue to edit the existing fisher effort maps for spatial accuracy by geographical references, travel time to fishing grounds, and habitat.
- Determine spatial seahorse bycatch areas based on fishers mapping data and seahorse observations.
- Return to interview locations and validate fisher effort and seahorse bycatch maps.

In order to gain a better understanding of *seahorse population response to human pressures*, we will perform the following activities:

- Additional interviews at four key locations along the Andaman Coast – eastern Phang-nga Bay, near Ao Nang, near Sikao and near Koh Sukorn.
- Create a seahorse distribution map based on fisher interviews from 2013 and seahorse observation maps for the Andaman Coast. Approximately one month will be dedicated to validation of distribution maps with fishers.
- Raise awareness among divers in National Parks about iSeahorse to generate information on seahorse populations inside Thailand’s national parks.
- Work with the DoF Geospatial Department to finalize spatial management maps to determine which seahorse populations are protected from human pressures.

In order to gain a better understanding of *seahorse life history responses to human pressures*, we will perform the following activities:

- Gather underwater life history data from seahorses at eight sites in the Andaman Coast and eight sites in the central and northern Gulf of Thailand.
- Continued analysis on port sampling data to generate length at maturity, size specific survival and individual growth rates.
- Work with Dr. Parichart Laksanawimol to explore collaborations for seahorse life history with port sampling data.

In order to gain a better understanding of *seahorse habitat responses to human pressures*, we will perform the following activities:

- Identify the habitat in areas of known seahorse bycatch reported by fishers.
- Additional capacity building with the DoF Geospatial Analysis department to gain access to habitat shapefiles.
- Overlay habitat shapefiles with fisher effort and seahorse observations to identify additional seahorse habitat areas.
- Overlay current spatial management measures with habitat data, and fisher and seahorse observation maps to determine which seahorse habitats are currently protected.

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Notification of Ministry of Agriculture and Cooperatives
Re : Specification of fishing gears, fisheries operations and fishing areas
prohibition in fishing ground
B.E. 2559

By virtue of Article 71 (1) of the Royal Ordinance on Fisheries B.E. 2558 (2015), the Minister of Agriculture and Cooperatives, hereby issue the following notification.

Item 1. No person shall use the following fishing gears in the coastal seas :

- (1) All kinds of trawl nets with motors.
- (2) All kinds of surrounding nets with purse lines.
- (3) Gillnets with 300 meshes in depth or over.
- (4) Folding crab traps having surrounding mesh of less than 2.5 inches.
- (5) Octopus traps used in a fishing operation per time more than 2,000

units.

(6) Squid lift nets or falling nets used with electricity generator (or dynamo) .

(7) Anchovy lift nets or falling nets used with electricity generator (or dynamo) .

(8) Shellfish dredges used with motor vessel.

Item 2. This notification shall come into force on the date of its publication in the Government Gazette.

Given on 12 February B.E. 2559
Chatchai Sarikalya
(General Chatchai Sarikalya)
Minister
Ministry of Agriculture and Cooperatives

Seahorse Research for monitoring

Thailand Department of Fisheries will plan to monitor seahorses in two ways. First we will continue to collect seahorse data during quarterly research trawls throughout the Gulf and Andaman coasts. Second, Thailand Department of Fisheries will monitor landing sites quarterly, on the Gulf and Andaman Coasts, of the major gears catching seahorses. Additionally we will analyze this data every year to monitor the status of the stock

1) Seahorse distribution from research vessel surveys

DOF try to update the seahorse distribution maps from spatial data on seahorse gathered by our research vessel, determine quarterly and annual catch rates, species composition, sex ratios and revise estimates of biomass.

There are 5 marine fisheries research and development centers under Marine Fisheries Research and Development Division involved with research surveys and data collection:

1. Upper Gulf Marine Fisheries Research and Development Center
2. Central Gulf Marine Fisheries Research and Development Center
3. Southern Marine Fisheries Research and Development Center
4. Eastern Gulf Marine Fisheries Research and Development Center
5. Andaman Sea Marine Fisheries Research and Development Center

Current and future monitoring data of sea horse in CPUE was collected by standard otter board trawl from five research vessels to investigate the status of sea horse. The research vessel operated 4 times in January, March, May and July every year at pre-determined locations in both the Andaman and Gulf Coasts. (station in Table 2 and Fig. 5) Trawl speed was set at 2.5 nautical miles / hour. Research trawls took place within each location for one hour.

Table 2. Survey station for research vessel

	Area	Station number
Gulf of Thailand (63)	Area 1	42 44 57
	Area 2	18 20 28 30 38 40
	Area 3	2 5 7 9 11
	Area 4	14 16 24 26 34 36 47 49
	Area 5	58 60 62 73 75 87 89 101 103
	Area 6	117 119 136 138 156 158 177 179 181
	Area 7	201 221 243 245 268 270
	Area 8	294 296 319 321 345 347 371 373
	Area 9	395 397 399 420 422 424 445 447 466
Andaman Sea (22)	Area 1	1 3 4 7 8
	Area 2	11 12 16 21
	Area 3	14 17 23 27 29
	Area 4	30 32 34 36 37 38 39 43

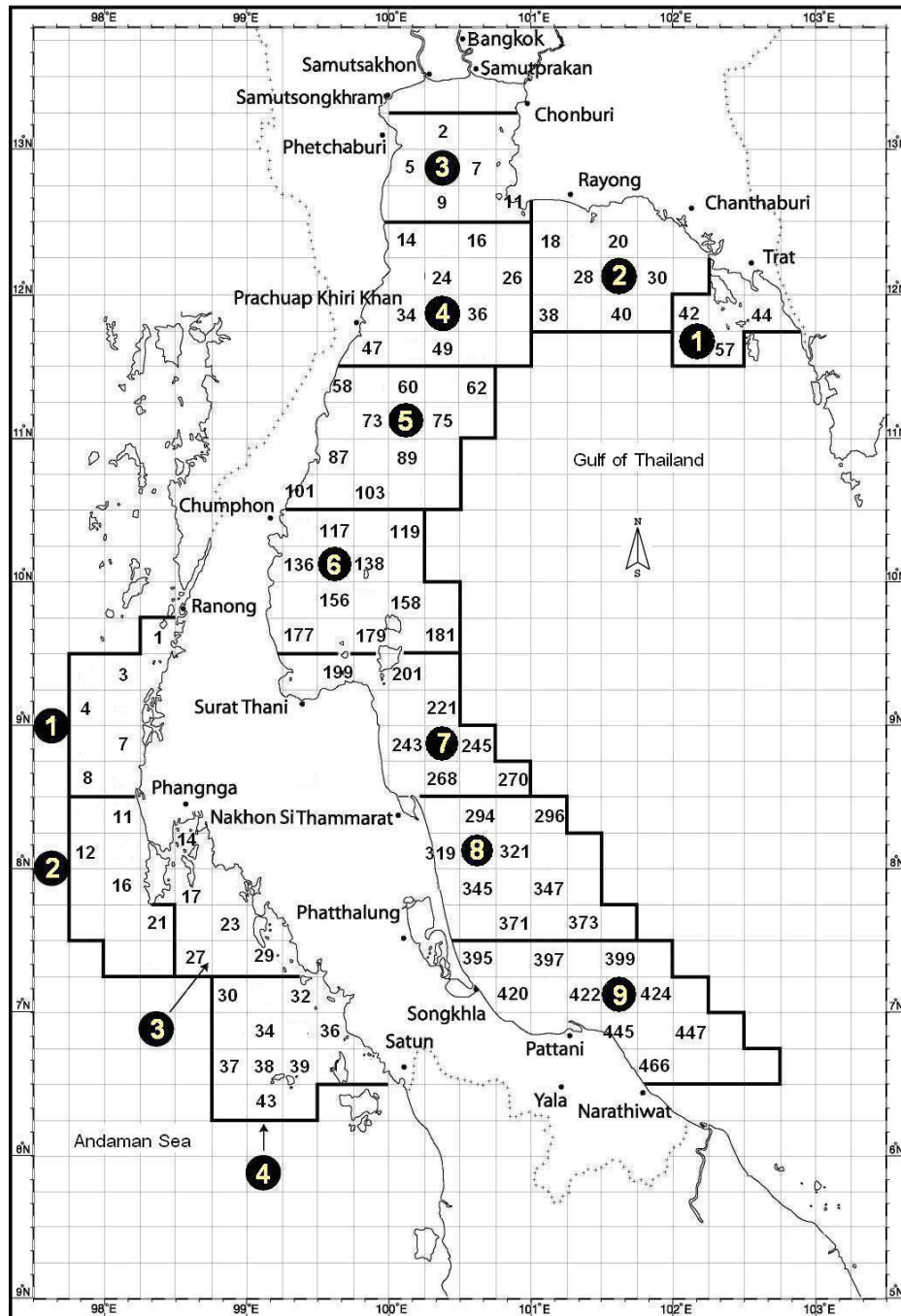


Figure.5 Survey station by research vessels in the Gulf of Thailand and the Andaman Sea.

During data collection on the research vessel the presence or absence of seahorse(s), the species composition and sex ratio per haul is documented. From this information we can determine quarterly and annual catch rates based on the number of seahorses per haul and the number of hauls with seahorses. Additionally we can monitor to see if there is a change in species composition or sex ratio of seahorses.

We will revise our estimate of seahorse biomass based on future information from trawl surveys.

Biomass estimation by swept area method from our research vessel

Let C_w be the catch in weight of a haul. Then C_w/t is the catch in weight per hour, when t is the time spent hauling (in hours). Let a be the area swept. Then a/t is the area swept per hour. For the estimation of the biomass we use the catch per unit area (CPUA), It is estimated by dividing the catch by swept area (in kilometers). (Sparre and S. V. Venema, 1992)

$$\text{Biomass} = \text{CPUA} * A/X$$

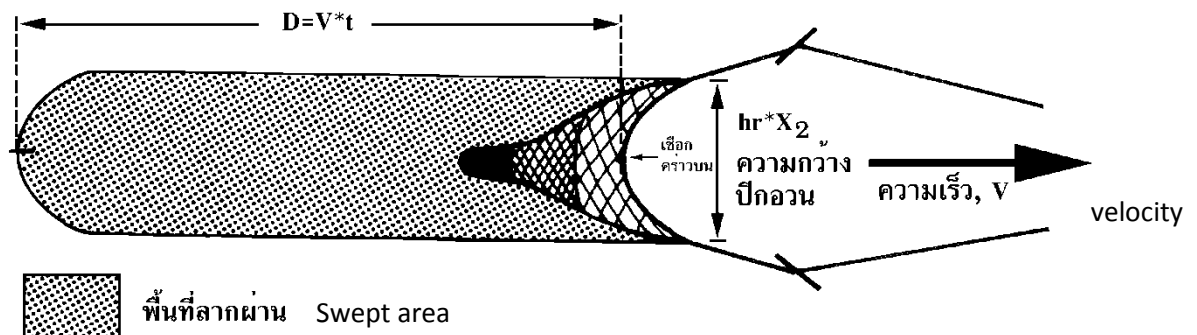
where

- CPUA is the catch per unit area (kg/km^2)
- A is area of survey per one hour (km^2)
- X is retention coefficient

CPUA is the catch per unit area equal to C_w / a (kg/km^2)

The swept area (a) can be estimate from

$$a = D * h, D = V * t$$



where

- V is velocity of the trawl over the ground when trawling (2.5 knot or 2.5 nautical mile/hour = 4.63 kilometer/hour)
- h is the length of head-rope of trawl net (39 meter = 0.039 kilometer)
- t is the time spent trawling (1 hour)

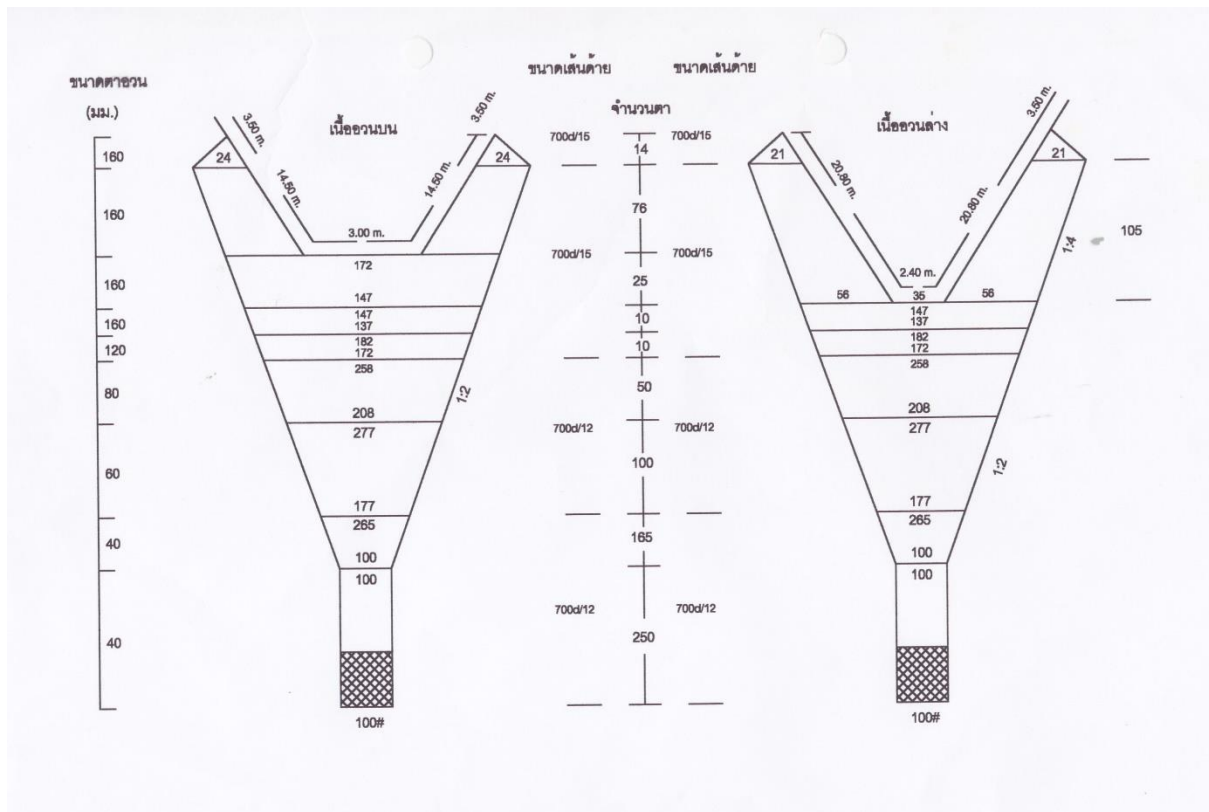


Figure 6 Trawl net for research vessel.

Cw is the catch in weight of a haul (kg).

A is area of survey per one hour equal to 1 grid of research survey (15 *15 nautical miles) 15 nautical miles equal to 27.78 km. Then 1 grid is equal to $27.78 * 27.78 = 771.73 \text{ km}^2$

X is retention coefficient. It is difficult to estimate which proportion of the fish that is present in the area swept by trawl gear is actually retained by the gear, in other words it is difficult to give a precise estimate of X. Underwater television recording show that the reaction of fish to trawls varies markedly between species. The value of X is usually chosen between 0.5 and 1.0. For trawlers in Southeast Asia as value of $X = 0.5$ is commonly used in survey work (Isarankura,1971; Seager, Martosubroto and Pauly,1980).

The following sets of maps have been created and will continue to be updated with new information from the DoF research vessels

Under the cooperation between Thailand and Project Seahorse, scientific diving and citizen science contributions (i-seahorse) were use to seek out and document seahorse population.

2) Landings data from trawl trap and gillnet fisheries and the first level trader

For landing data, Thailand planed to collect data from 3 landing sites along the Gulf of Thailand and 2 landing sites along the Andaman Sea for update the status of sea horse on quarterly basis. The data consisted of catch rate (total number of seahorses in total hauls or days spent fishing), species composition and length of seahorse form main fishing gears that

caught seahorse. And also we can get the information on species in trade from interviewing the first level trader.

Landing site	3 landing sites along the Gulf of Thailand and 2 landing sites along the Andaman Sea
Gear	Trawl fisheries, trap and gill-net fisheries
Data	Catch rate, species composition in fishing and in trade and length of sea horse
Month	January May September annually

From this information we can compare future catch rates to catch rates calculated with 2013/2014 data (currently being analyzed by joint DoF and Project Seahorse team) to identify changes over time. Additionally we can determine if there is a change in species composition to identify which gears are exerting pressure on the different seahorse species. We will compare mean length at vulnerability to the fisheries with known length at reproductive maturity by species to identify if any fisheries show signs of overfishing.

Upcoming fisheries management for seahorse

Now DOF working with Kasetsart University on genetics research to identify species of Sea horse with quick and easy genetic tools to apply for inspection either at the port or at customs, in the future. Current research is working to build a genetic library of seahorses in Thailand. We are currently in the analysis stage of this research and anticipate completion by 2018.

Conclusion

Based on the collaborative efforts of Thailand and Project Seahorse, and the plans for future monitoring and management, Thailand would like to see their status downgraded our listed.

Translation**Royal Ordinance on Fisheries****B.E. 2558 (2015)****Bhumibol Adulyadej, Rex**

BHUMIBOL ADULYADEJ, REX;

Given on the 13th Day of November B.E. 2558;Being the 70th Year of the Present Reign.

His Majesty King Bhumibol Adulyadej is graciously pleased to proclaim that:

Whereas it is deemed expedient to revise the laws on fisheries;

By virtue of the provision under section 21 of the Constitution of the Kingdom of Thailand (Interim) B.E. 2557, be it therefore that the Royal Ordinance be enacted by His Majesty the King, as follows:

Section 1. This Royal Ordinance is called “the Royal Ordinance on Fisheries B.E. 2558 (2015)”

Section 2. This Royal Ordinance shall come into force on the day following the date of its publication in the Government Gazette.

Section 3. The Fisheries Act (B.E. 2558) shall be repealed.

Section 4. The provisions of this Royal Ordinance aim to reorganize fisheries in Thailand and in waters at large with a view to preventing IUU fishing in order to preserve aquatic animal resources as a sustainable source of food for humanity and preserve the environment in an appropriate state along the line of approaches, criteria and standards recognized internationally, as well as to protect the welfare of seamen and prevent all forms of forced labour in the fisheries sector, with due regard to the following objectives:

- (1) achieving good governance in the management and conservation of aquatic resources and the fisheries sector, and ensuring that complete and accurate data thereof are collected;
- (2) protection of special interests of artisanal fisheries and local fisheries communities;
- (3) fulfillment of Thailand’s international obligations with regard to the conservation and management of aquatic resources;

2

(4) to provide effective means for preventing, deterring and eliminating IUU fishing, as well as unlawful labour practices in the fisheries sector.

(5) use of best available scientific evidence to achieve long-term economic, social and environmental sustainability, in line with the ecosystem based approach and precautionary approach, to ensure that fisheries resources are maintained or restored to a level that can produce the maximum sustainable yield;

(6) prevent and eliminate overfishing and overcapacity and ensure that the level of fishing effort does not undermine the sustainability of fisheries resources;

(7) implementation of systematic measures for the application of this Royal Ordinance;

(8) cooperation with other states, private agencies, as well as international organisations, with a view to achieving the objectives under this Royal Ordinance;

(9) ensure legal working conditions and welfare of workers in all areas of the fisheries sector;

(10) ensuring effective monitoring, surveillance and control of fishing activities;

(11) implementation of an effective traceability system from fishing operations to ultimate consumers;

(12) imposing proportional and deterrent administrative and criminal sanctions.

Section 5. In this Royal Ordinance:

“Aquatic animals” mean animals normally inhabiting water, amphibians, animals inhabiting inundated areas, animals partially inhabiting water, and animals having one part of their life cycles in water during a specific water-borne part of their life cycles. These also include aquatic animals’ eggs and spawns, sperms, marine algae, carcasses or any one part of those aquatic animals, as well as aquatic plants as specified by Notification of the Minister as well as residuals or any one part of such aquatic plants.

“Aquatic product” means a product resulting from an aquatic animal-processing procedure or a process whereby aquatic animals are used as raw materials.

“Aquatic animal processing” means any act undertaken to transform aquatic animals for use or consumption purposes, but does not include the mere packaging of aquatic animal without any transformation of the aquatic animal or transformation of the aquatic animal for immediate consumption of a consumer.

“Fisheries” means fishing operations, aquaculture, the caretaking of aquatic animals, or aquatic animal processing, including any operation in support of a fishing operation.

3

“Fishing” means to search, attract, catch, take or harvest fish or any activity which can reasonably be expected to result in the attracting, catching, taking or harvesting of fish at a fishing ground.

“Fishing ground” means a tract of land with still or running water, and any beach constituting public domain of State, including a forest and a ground which is naturally inundated, notwithstanding that it constitute a public domain of State or a tract of land privately owned, as well as seas.

“Seas” mean coastal seas, offshore seas, seas outside Thai waters and seas lying in the jurisdiction of another coastal state.

“Thai waters” mean inland waters, coastal seas and off-shore seas.

“Inland waters” mean fishing grounds lying within the Kingdom, excluding seas.

“Coastal seas” means the seas lying within the Kingdom extending up to three nautical miles from the baselines. In light of exigencies based on purposes related to aquatic resource management, a Ministerial Regulation may be issued to determine the expanse of coastal seas in any area to cover a distance starting from the baseline shorter or further than three nautical miles as appropriate. Any such adjustment shall not result in a distance off the baseline of less than one point five nautical miles nor of further than twelve nautical miles. In any such case, a map delineating the areas prescribed thereby shall be attached to any such Ministerial Regulation.

“Baseline” means a line where the sea meets land along a seashore and the outer limits of an island, specified as having a water depth line at zero meter on the navigation map of the Hydrographic Department, or the outer limits of reclaimed areas.

“Offshore seas” mean the seas located in the Kingdom beyond the coastal seas up to either the extreme bounds of the exclusive economic zones pursuant to the Notification on the exclusive economic zones of the Kingdom of Thailand or the extreme bounds of the continental shelves under the sovereignty of the Kingdom of Thailand, the further boundary of either being the line to prevail.

“Seas outside Thai waters” mean the high seas lying beyond the offshore seas and include the seas lying within the jurisdiction of a coastal state other than the Kingdom of Thailand.

“Seas lying within the jurisdiction of a coastal state” mean the seas subject to the jurisdiction of a coastal state or where the coastal state has exploitation rights as provided under international law.

“Coastal state” means a country, excluding Thailand, with boundaries immediately adjacent to the sea.

“Freshwater fishing” means fishing operations in fishing grounds lying in inland waters.

“Artisanal fishing” means fishing operations in coastal seas in which a fishing vessel is used or in which a fishing gear is used without a fishing vessel, but in any case does not include commercial fishing.

“Commercial fishing” means fishing operations using a fishing vessel of a size from ten gross tonnage or a fishing vessel fitted with an engine of a horse power as prescribed by the Minister.

“Aquaculture” means the culture of aquatic animals or aquatic animal species breeding by means of natural methods, artificial insemination methods or by any other method on an aquaculture ground in any stage of the life cycle of any such aquatic animal.

“Aquaculture ground” means a pond, enclosure, cage or an area used for agriculture of any other description notwithstanding that it is located on a tract on land owned privately or in public domain of State or in any fishing ground that the digger, the builder, the creator, the owner or the possessor thereof aims to use directly for aquaculture purposes.

“Caretaking of aquatic animals” means post-capture caretaking of aquatic animals prior to aquatic animal processing.

“Fishing gear” means a machine, tool, equipment, component, weapon, pole, and stake used in a fishing operation.

“Fishing vessel” means a vessel of any size used or intended for use for the purposes of commercial exploitation of aquatic animal resources, including support ships, fish processing vessels, vessels engaged in transshipment and carrier vessels equipped for the transportation of fishery products, except container vessels.

“Thai fishing vessel” means a fishing vessel registered as a Thai vessel pursuant to the law on Thai vessels.

“Point of reference” means a relative quantity of the fishing capacity and the natural capacity of aquatic animal production determined by a scientific process that take into account the quantities, sizes, birth and mortality rates, as well as and the different stages of aquatic animals for the purposes of determining the maximum sustainable yield.

“IUU fishing” means illegal fishing, unreported fishing and unregulated fishing.

“Illegal fishing” means:

(1) a fishing operation without legal authorization or that is against Thai laws or the laws of a coastal state;

(2) a fishing operation that is not in compliance with measures developed by a relevant international organisation for the purposes of fisheries conservation and management or a fishing operation that is against relevant international laws.

“Unreported fishing” means:

(1) a fishing operation that is not notified of or reported, or a fishing operation the particulars of which are incompletely reported as required by rules or procedures provided by law or ministerial regulations, notifications or directives issued pursuant to law; or a fishing operation the particulars of which are falsely reported;

(2) a fishing operation in an area under the jurisdiction of an international organisation to which any such fishing operation is neither notified of nor reported, or a fishing operation in any such area the particulars of which are incompletely reported as per the rules and procedures of any such organisation, or a fishing operation in any such area the particulars of which are falsely reported.

“Unregulated fishing” means:

(1) a fishing operation in a zone under the responsibility of an international organisation undertaken by the use any fishing vessel, be it with a designated nationality or a stateless vessel, in a manner that is not in compliance with or is in violation of fisheries conservation or management measures developed by any such international organisation;

(2) a fishing operation in a fishing ground in which no applicable fisheries conservation and management measures have been put in place, the manner of fishing of which is not in line with state responsibilities for the conservation of aquatic animal resource sources pursuant to the principles of international law.

“International organisation” means a Regional Fisheries Management Organisation (RFMO) established for the purposes of fisheries conservation and management.

“Stateless vessel” means a vessel that is not registered under the laws of any state, or a vessel with at least two designated nationalities, or a vessel that changes flag during navigation.

“Vessel registrar” means a vessel registrar pursuant to the law on Thai vessels.

“Owner of a vessel” means a person having the ownership or the right to possession of a fishing vessel.

“Master of a vessel” means a person having command or charge of a fishing vessel.

“Seaman” means a crew member or any person who is assigned with a position on board a vessel, excluding the master thereof.

“Importation” means bringing or sending into the Kingdom.

“Exportation” means taking or sending out of the Kingdom.

“Transit” means bringing or sending through the Kingdom.

6

“Fishing port” means any place for the berthing of a fishing vessel or for the transshipment or landing of aquatic animals or aquatic animal products from a fishing vessel, regardless of whether such a place is situated onshore or offshore.

“Fish market enterprise” means an authorized fish market enterprise, or a fish pier designated as an authorized fish market enterprise pursuant to the law on fish market enterprises.

“Transshipment of aquatic animals” means the unloading of aquatic animals or aquatic animal products in all or in part from a fishing vessel onto another vessel.

“Observer” means a person having the knowledge and independence required for performing duties on board a fishing vessel.

“Licensee” means a person granted a license or a permit that authorizes him/her to undertake an action pursuant to this Royal Ordinance.

“Competent official” means an official appointed by the Minister to perform actions in accordance with this Royal Ordinance.

“Committee” means the National Fisheries Committee.

“Director-General” means the Director-General of the Department of Fisheries.

“Minister” means the minister taking charge of the execution of this Royal Ordinance.

Section 6. The Minister of Agriculture and Cooperatives shall have charge of the execution of this Royal Ordinance, and shall have the power to issue Ministerial Regulations fixing the rates of duties and fees not exceeding those stipulated in the schedule annexed hereto, reducing or exempting duties and fees, as well as determining matters for the execution of this Royal Ordinance.

Any such Ministerial Regulation shall enter into force upon its publication in the Government Gazette.

Section 7. Requests for permission, filings for registration, grants of permission, acceptances of registration, issuances of licenses, renewals of licenses and the transfer of licenses pursuant to this Royal Ordinance shall be in accordance with the rules, procedures and conditions provided by Ministerial Regulation. Any such Ministerial Regulation may fix duties and fee rates not exceeding those stipulated in the schedule annexed to this Royal Ordinance.

A Ministerial Regulation for the determination of duties or fees issued pursuant to paragraph one may impose different rates, taking into consideration the types, kinds, sizes or numbers of fishing vessels, or fishing gears, or the types, kinds, sizes, nature or forms of aquaculture enterprises or fishing operations.

General Provisions

Section 8. For the purposes of compliance with obligations to which Thailand is committed to be bound by international organisations and conventions related to fisheries conservation and management to which Thailand is a state party, any wrongdoing pursuant to this Royal Ordinance or the laws of a coastal state or in accordance with criteria or measures based on relevant international laws, or the rules or measures of relevant international organisations related to fisheries conservation and management, whether being committed in Thai waters or outside Thai waters, and using a Thai fishing vessel, a non-Thai fishing vessel, or a stateless vessel, shall be regarded as a wrongdoing within the Kingdom, and shall be subject to a sanction prescribed in this Royal Ordinance. In this connection, Thai courts shall have the power to try and adjudicate any such case, and competent officials, inquiry officials and public prosecutors shall have the power to undertake relevant legal proceedings.

If any such offence occurs outside Thai waters and does not involve a Thai fishing vessel or a Thai national, proceedings pursuant to the provision under paragraph one shall be implemented after such authorities have been notified thereof by a foreign state in which any such wrongdoing has occurred or by a relevant international organisations related to any such wrongdoing.

It shall be the duty of the Director-General to collaborate with officers of a foreign state or those of international organisations in undertaking sanction proceedings against offenders pursuant to this Royal Ordinance.

Section 9. For the purposes of fisheries management, the Department of Fisheries shall undertake steps and process all the data collected from the granting of permission, the issuance of licenses, registration or as reported pursuant to this Royal Ordinance. The Department shall prepare and submit up-to-date fisheries statistics to the Committee on a monthly basis or over a shorter period of time as prescribed by the Committee.

Where it is necessary for the purposes of verifying and collecting fisheries statistics, the Director-General shall have the power to determine a period of time and data to be collected and the areas designated for the purposes of data collection. A notification in this regard shall be displayed at the office of the local heads of the sub-districts and local administrative organisations concerned.

When any such notification pursuant to paragraph two has been issued, the competent official shall have the power to enter premises used for the practice of fisheries or premises related to fisheries during their respective working hours in the areas and during the period of time prescribed in any

such notification. In this regard, persons practicing fisheries or persons concerned shall truthfully reply to the questions posed.

Section 10. No person shall use a stateless vessel in their fishing operations.

Section 11. A factory operator under the law on factories who engages in a business relating to aquatic animals is prohibited from employing a person in violation of the law on labour protection or an alien who does not hold a licence under the law on working of aliens.

In the case where a competent official finds a violation under paragraph one, if the number of persons employed unlawfully found at the factory is not more than five, the competent official shall forthwith report to the Director-General, and the Director-General shall order the suspension of the factory operations for a period of ten to thirty days.

In the case where a competent official finds a violation under paragraph one, if the number of persons employed unlawfully found at the factory is more than five, the competent official shall forthwith report to the Director-General, and the Director-General shall notify the Permanent Secretary of the Ministry of Industry to order the closure of the factory pursuant to the law on factories.

In the case where the competent official finds that a factory operator whose license has been suspended under paragraph two has committed another violation under paragraph one within a period of three years as from the order of suspension, the competent official shall forthwith report to the Director-General, and the Director-General shall notify the Permanent Secretary of the Ministry of Industry who shall order the closure of the factory pursuant to the law on factories.

A factory operator who has received a factory closure order under paragraph three or paragraph four shall be prohibited from operating a factory to engage in a business relating to aquatic animals and the licensor under the law on factories shall not issue a license for the operation of a business relating to aquatic animals to such person.

An order of factory closure under this section shall have the effect of license revocation for Category 3 factories under the law on factories.

Chapter 2

Fisheries Management

Section 12. The provisions of this Chapter aim to provide for policies and oversight of fisheries management by way of promoting the participation of all stakeholders in the management and conservation of aquatic animal resources, as well as to establish a system of good governance in order to

ensure sustainable use as determined by the examination of best scientific evidence and balanced by economic, social and environmental considerations, in line with the ecosystem based approach and precautionary approach, and also to ensure that fisheries resources are maintained or restored to a level that can produce the maximum sustainable yield, as well as to prevent and eliminate overfishing and overcapacity and ensure that the level of fishing effort does not undermine the sustainability of fisheries resources

Part 1

The National Fisheries Committee

Section 13. A committee shall be established, called “The National Fisheries Committee”, comprising Prime Minister as its chairperson, Minister of Agriculture and Cooperatives as its vice-chairperson, Permanent Secretary of the Ministry of Foreign Affairs, Permanent Secretary of the Ministry of Agriculture and Cooperatives, Permanent Secretary of the Ministry of Transport, Permanent Secretary of the Ministry of Natural Resources and the Environment, Permanent Secretary of the Ministry of Labour, Commander-in-Chief of the Royal Thai Navy, Commissioner General of the Royal Thai Police, Director-General of the Department of Provincial Administration, President of the National Farmers’ Council, President of the Thai Chamber of Commerce, President of the Federation of Thai Industries as committee members and not more than ten experts appointed by the Minister as committee members.

The Director-General shall serve as a committee member and secretary.

Section 14. Expert committee members pursuant to section 13 shall be appointed from the following persons:

(1) one association representative in each of the following fields: coastal fisheries, offshore fisheries, fisheries outside Thai waters, inland fisheries, aquaculture and aquatic animal processing;

(2) not more than two persons having knowledge or operational experience in the field of natural resources and the environment;

(3) not more than two fisheries academics.

Section 15. A person appointed as an expert committee member must not have been imprisoned pursuant to a final court judgement on account of an offence pursuant to the law on fisheries.

Section 16. An expert committee member shall hold office for a term of two years.

During the time in which an expert committee member vacates his/her office for any reason whatsoever and no other expert committee member has been appointed in his/her place, the Committee shall comprise only the remaining Committee Members.

An expert committee member vacating office at the expiration of term may be reappointed, but may not hold office for more than two consecutive terms.

Section 17. Other than the expiration of term, an expert committee member shall vacate office upon:

- (1) death;
- (2) resignation;
- (3) being removed as a representative of the association for which he/she is appointed, or being disqualified in relation to the qualification pursuant to section 15;
- (4) being removed by the Minister on account of his/her inefficient performance of duties, misconduct, or incompetence;
- (5) becoming bankrupt;
- (6) being an incompetent or quasi-incompetent person;
- (7) being sentenced through a final court judgment to imprisonment.

Section 18. Procedures and conduct of meetings shall be as prescribed by the Committee.

Section 19. The Committee shall have the power and duty to determine fisheries policies and supervise fisheries management as follows:

- (1) determining policies for the development of fisheries in Thai waters in line with aquatic animal resource stocks and the country's fishing capability based primarily on the points of reference;
- (2) determining policies for the promotion, development and resolution of problems pertaining to fisheries outside of Thai waters;
- (3) determining the country's aquaculture development policies;
- (4) determining policies for the development of the country's related fisheries industries;
- (5) determining control measures in order to achieve the policies under (1), (2), (3) and (4);
- (6) determining the total allowable catch for fishing operations within Thai waters;
- (7) determining approaches to and targets for the country's fisheries development in line with the conservation of aquatic animal resources and the environment;
- (8) determining approaches to the management of aquatic animal resources to maintain appropriate conditions and sustainable fishing;

(9) preparing an annual performance report for submission to the Council of Ministers and dissemination to the general public;

(10) implementing any other matters prescribed by law as being within the duties and authority of the Committee or as assigned by the Cabinet.

Policies prepared pursuant to (1), (2), (3) and (4) shall be submitted to the Council of Ministers for deliberation and approval. Upon the approval thereof by the Council of Ministers, all state agencies shall implement any such policy and ensure that any such policy is undertaken as such.

Section 20. The Committee shall have the power to appoint *ad hoc* committees or sub-committees to carry out undertakings tasked by the Committee.

Ad hoc committee and sub-committees meetings shall be conducted as prescribed by the Committee.

Section 21. Measures issued pursuant to section 19(1), (2), (3), (4), (5), (6) and (7) shall at least aim to achieve the following outcome:

(1) to conserve, preserve and prevent the extinction of aquatic animals, and to enable the exploitation of aquatic animal resources in a sustainable manner, which will culminate in the achievement of a balanced ecological system and biodiversity;

(2) to prevent and deter the support of IUU fishing, including personnel, fuel, fishing gear or any other form of support.

(3) to develop measures for the supervision and control of fishing operations in line with the international law and standards;

(4) to develop an approach to the development of fishing cooperation with other states and various international organisations in order to conserve and manage threats to aquatic animal resources, aquatic animals' migration or aquatic animals' habitats, pursuant to precautionary principles;

(5) to develop measures for the prevention of fishing operations that disturb or obstruct the natural process whereby sufficient time for reproduction and adequate restoration of reproductive capacity are to be attained; this is so designed in order to achieve fishing operations that are in line with the natural reproductive capacity, and the ability to achieve sustainable exploitation;

(6) to develop measures requiring all state agencies concerned to undertake steps to revise the laws, rules, procedures and conditions to be in line with the progress and developments involving criteria regulating fishing operations set forth by international organisations.

(7) to develop an approach requiring that persons practicing fisheries and other occupations related to fisheries participate in the conservation and protection of fisheries resource sources

and aquatic animal resource sources such that they are in an appropriate state and are amenable to sustainable fishing operations.

Section 22. Approaches to the management of aquatic animal resources pursuant to section 19(8) shall at least cover the following matters:

- (1) an approach to the promotion of measures for conservation and management of sustainable fishing;
- (2) an approach to the safeguard and protection of rights, as well as the development and promotion of occupations and livelihood of Thai fishermen;
- (3) an approach to the prevention of excessive exploitation of aquatic animal resources;
- (4) an approach to the prevention of IUU fishing operations;
- (5) an approach to cooperation with international organisations, different nations as well as coastal states in the dissemination and exchange of statistical information on the catching of aquatic animals and any other data relating to fishing operations;

Section 23. In compliance with the policies pursuant to section 19, the Department of Fisheries shall take actions to develop and submit a Fisheries Management Plan in line with such a policy to the Committee for deliberation. This plan shall subsequently be submitted to the Council of Ministers for approval and implementation by agencies concerned.

Section 24. The Fisheries Management Plan pursuant to section 23 shall at least cover operational approaches to the following matters:

- (1) an approach to the issuance of fishing licenses in line with the fishing capacity and the maximum sustainable yield, using points of reference as the basis for determination;
- (2) an approach to the restoration of aquatic animal resources to their normal natural state;
- (3) an approach to a reduction in the fishing vessels engaged in commercial fishing operations;
- (4) an approach to the elimination of IUU fishing operations;
- (5) an approach to the resolution of conflicts of interests between artisanal and commercial fishing operations;
- (6) an approach to preventing the catching of aquatic animals of premature sizes;
- (7) an approach to the development of information related to fisheries;
- (8) an approach to the enhancement of fisheries management.

Section 25. In order to promote participation and provide support to local fishing communities in the management, maintenance, conservation, restoration and sustainable utilization of

aquatic animal resources within fishing grounds in freshwater fishing zones or coastal seas, the Department of Fisheries shall take actions to provide assistance or support in the following matters:

- (1) promote participation on the part of local fishing communities in the development of the policy pursuant to section 19(1);
- (2) encourage association and arranging for the registration of local fishing community organisations pursuant to the rules prescribed by the Director-General;
- (3) provide counsel to local fishing communities related to the management, maintenance, conservation, restoration and utilization of aquatic animal resources, as well as provide assistance and support to the implementation of communities' work, projects or activities in such matters;
- (4) disseminate knowledge or information on the management, maintenance, conservation, restoration and utilization of aquatic animal resources.

Part 2

Provincial Fisheries Committee

Section 26. There shall be a provincial fisheries committee in each of the provinces prescribed by the Minister. Any such provincial fisheries committee shall comprise the Provincial Governor as Chairperson, a representative of the Ministry of Natural Resources and the Environment, a representative of the Marine Department, the Provincial Chief Prosecutor in the capacity of the Head of the Provincial Chief Attorney's Office, the Provincial Commerce Officer, District Chiefs in districts where fisheries operations are undertaken, the Chief Executive of the Provincial Administrative Organisation, the President of the Provincial Farmers' Council as *ex officio* committee members, and not more than thirteen experts appointed by the Provincial Governor as committee members.

The Provincial Fisheries Officer shall serve as a committee member and secretary.

In any province having areas contiguous with marine waters or the Mekong River, a representative of the Royal Thai Navy shall be added as an *ex officio* member.

Section 27. Expert committee members pursuant to section 26 shall be appointed from among the following persons:

- (1) representatives of local fishing community organisations in the fields of coastal fisheries, offshore fisheries, freshwater fisheries, aquaculture or aquatic animal processing who have been registered pursuant to section 25(2) as deemed appropriate after due consideration of the fair and comprehensive distribution of the stakeholders;

(2) not more than three persons having knowledge or operational experience in the field of fisheries or in the fields of natural resources and the environment.

Section 28. The Provincial Fisheries Committee shall have the following powers and duties:

(1) compile recommendations and propose approaches to the promotion of the fishing profession, the management, maintenance, conservation, restoration and sustainable utilization of aquatic animal resources by local fishing community organisations in its jurisdiction and submitting them to the Committee for deliberation in the preparation of policies pursuant to section 19(1);

(2) deliberate upon and make suggestions regarding approaches to the development of or the resolution of problems related to fisheries, or the management, maintenance, conservation, restoration and sustainable utilization thereof in fishing grounds in its jurisdiction to the Minister, the Committee or the Director-General;

(3) issue notifications pursuant to section 56, section 71, and section 77 which are to be published in the Government Gazette;

(4) take any other action as assigned by the Minister or the Committee.

In the case of an emergency or where there is an incident of great exigency necessitating the issuance of a notification under section 56 and section 71, the Provincial Fisheries Committee shall have the power to issue notifications that take effect temporarily over a period of time not exceeding sixty days. In this respect, the Minister shall deliberate thereupon to the full fruition thereof within sixty days as from the date on which any such notification comes into force.

Where the Minister cannot complete the deliberation upon any such matter to full fruition within the specified timeframe pursuant to paragraph two, any such notification shall continue to take effect until the moment at which an order disapproving thereof is issued by the Minister.

Where a Provincial Fisheries Committee does not exist in any province, the powers and duties of the Provincial Fisheries Committee shall lie in the Provincial Fisheries Officer or a person assigned by the Director-General. In exercising such powers and duties, the Provincial Fisheries Officer shall consult the Provincial Governor and agencies concerned, and shall take into account the opinions of members of the public concerned.

Section 29. The provisions of section 15, section 16, section 17, section 18 and the provisions on the appointment of sub-committees and the conduct of sub-committee meetings pursuant to section 20 shall apply to the Provincial Fisheries Committee *mutatis mutandis*.

Fishing Operations in Thai Waters

Section 30. The provisions of this Chapter are aimed at the management, control and supervision of fishing operations, and the balance of interests between artisanal and commercial fishing. When exercising powers and duties under this Chapter, the parties concerned shall take into account the natural reproduction capacity as determined by best scientific methods in order to identify the points of reference which will allow fisheries undertakings to take place in a sustainable manner and enable the people to have access to an appropriate source of food.

Section 31. Any person wishing to undertake freshwater fishing in public domain of the State, by using a fishing gear prescribed by the Director-General must obtain a license issued by a competent official.

The provision under paragraph one shall not apply to fisheries in aquaculture grounds.

Section 32. Any person wishing to engage in artisanal fishing by using a fishing vessel or fishing gear of a size or description prescribed by the Director-General must obtain an artisanal fishing license issued by the Director-General or a person assigned by the Director-General, except where the fishing vessel or fishing gear is of the type prescribed by the Director-General.

The issuance of a license pursuant to paragraph one shall be solely executed for each fishing vessel. The number and type of fishing gears authorized for the purposes of fishing operation shall also be specified on the license.

Section 33. A person engaging in artisanal fishing shall comply with the rules and procedures for fishing prescribed by the Director-General.

For the purposes of monitoring, the Director-General may determine that a person engaging in artisanal fishing prepare a fishing logbook, which shall at least comprise information on the types and quantities of aquatic animals caught and the area(s) in which fishing grounds are located.

Any person engaging in artisanal fishing shall keep a fishing logbook under paragraph two and readily present it to the competent official upon the return of their fishing vessel to a port of entry.

Section 34. An artisanal fishing license holder shall not engage in a fishing operation in offshore seas.

Section 35. Any person wishing to engage in a fishing operation without using a fishing vessel, but uses a fishing gear of the type and size prescribed by the Director-General, must obtain a license from the Director-General or a person designated by the Director-General and comply with the rules, procedures and conditions prescribed by the Director-General or as stipulated in the license.

Section 36. Any person wishing to engage in commercial fishing must obtain a commercial fishing license issued by the Director-General or a person designated by the Director-General.

The issuance of a license pursuant to paragraph one shall be executed specifically for a particular fishing vessel. The number and type of fishing gears authorized for the purposes of fishing operation, areas in which fishing operations are to be undertaken, the maximum allowable catch of aquatic animals allowed for fishing operations or the period during which fishing operations are allowed shall also be specified on the license in alignment with the fishing capacity and the maximum sustainable yield of aquatic animals for the purposes of sustainable fisheries stipulated in the Fisheries Management Plan.

Section 37. A commercial fishing licensee must provide an occupational safety and hygiene system, as well as provide proper working conditions for seamen as prescribed by Ministerial Regulation.

Section 38. A commercial fishing licensee must not engage in a fishing operation in coastal seas.

Section 39. Any person requesting a license pursuant to section 32, section 35 and section 36 must not be under any of the following prohibitions:

(1) being convicted by a final court judgement due to a commission of any offence under section 114, and a period of five years has not yet lapsed since the judgment day;

(2) being a person whose fishing license is being suspended;

(3) being a person subject to an order of the Director-General issued pursuant to section 113(1) or (5) and a period of five years has not yet lapsed since the day of the order;

(4) being a person subject to an order of the Director-General issued pursuant to section 113(2) and the prohibition period has not yet expired;

(5) being a person whose fishing license has been revoked and a period of five years has not yet lapsed since the revocation to the day of the license application;

(6) a foreign state or international organisation has given written notice that a suspension of such person's fishing authorization has not yet expired or that fishing authorization has been revoked by the competent authority of such state or international organisation;

(7) being a person whose fishing license has been revoked twice within a period of five years.

Section 40. A license pursuant to section 31, section 32, section 35 and section 36 shall be valid for two years as from the date of issue.

Section 41. A licensee pursuant to section 31, section 32, section 35 and section 36 shall affix and display the license on the fishing vessel or carry a substitute card to be used in lieu of the license issued by the Department of Fisheries for inspection.

It shall be the duty of the Department of Fisheries to issue a substitute card to be used in lieu of a license to a licensee. Any such substitute card shall be made of a water-proof material with particular details of the license as appropriate.

Section 42. No fishing licensee pursuant to section 31, section 32, section 35 and section 36 shall modify any fishing gear such that its characteristics are different from those specified in the license.

Section 43. No commercial fishing licensee shall engage in a fishing operation different from that specified in the license or as periodically prescribed by the Director-General. Any such prescription shall allow at least a fifteen-day preparation period in advance.

Section 44. A fishing license may not be transferred with the exception of a transfer thereof to one's parents, spouse or descendant.

Section 45. In the case where evidence based on a point of reference shows that the maximum aquatic animal reproductive capacity is not adequate for the attainment of sustainable fishing operations, the Minister shall issue a notification suspending the issuance of fishing licenses temporarily. With regard to the fishing licenses already issued, a meeting shall be held between the Department of Fisheries, agencies concerned and fishing licensees for the purposes of deliberating upon a reduction of the total allowable catch as necessary in a manner that does not cause those already issued with fishing licenses to sustain excessive losses. In the case where no conclusion is reached, the Minister shall have the power to reduce the total allowable catch as deemed fit or determine other measures for persons undertaking fishing to comply with within a timeframe prescribed. Where necessary, a proposition may also be made to the Committee for a determination of the appropriate maximum number of fishing vessels, as well as operational measures for the handling of fishing vessels in excess of the appropriate number thus prescribed.

Section 46. No state official pursuant to the law on Thai vessels and the law on navigation in Thai waters shall register or issue a use of vessel license for fishing purposes in the following cases:

- (1) vessels used for fishing purposes have exceeded the number prescribed by the Committee;
- (2) a vessel on a list of fishing vessels used in IUU fishing as notified by the Director-General;

(3) a vessel that has been registered as a fishing vessel in a foreign state and has a history of IUU fishing.

When determining whether a foreign fishing vessel has a history of IUU fishing, the competent authority under the law on Thai vessels and law on navigation in Thai waters shall seek verification from the relevant competent authority of the foreign state.

Chapter 4

Fishing Operations outside Thai Waters

Section 47. The provisions of this Chapter aim to secure fulfillment of Thailand's international obligations with regard to the conservation and management of aquatic resources, cooperation with other states and private agencies, as well as international organisations, with a view to achieving the objectives under this Royal Ordinance.

Section 48. Any person wishing to use a Thai vessel for the purposes of fishing outside Thai waters shall submit an application for a license to fish outside Thai waters to the Director-General or a person designated by the Director-General.

The issuance of a license pursuant to paragraph one shall be executed specifically for a particular fishing vessel. The number and types of fishing gears authorized for the purposes of fishing operation shall also be specified on the license. If an applicant wishes to engage in a fishing operation in an area under the jurisdiction of coastal state, the Director-General or a person designated by the Director-General may accord authorization therefor only when the applicant is able to present proof of a right to engage in fishing operations in the waters of any such coastal state, and when there is clear evidence that the applicant for the license is in a position to comply with the laws, rules and measures of the coastal state or the international organisation concerned.

The provisions of section 39 shall apply to a license application under this section *mutatis mutandis*.

Section 49. In the case where the holder of a license for fishing outside Thai waters engages in a fishing operation in an area under the jurisdiction of a coastal state or in an area under the control and responsibility of an international organisation, apart from having to comply with this Royal Ordinance, the licensee shall have to comply with the laws, rules and standards of conservation and fisheries management of any such coastal state or international organisation.

Section 50. A holder of a license to engage in fishing outside Thai waters must have an observer stationed on board the fishing vessel in accordance with the rules prescribed by the coastal state or the international organisation having jurisdiction over the intended area of fishing operation, or as prescribed by the Director-General.

An observer shall not be a person already assigned to do any other duty on board a fishing vessel, and shall have other qualifications as prescribed by the Director-General. The rules and procedures of training, as well as the registration of observers shall be as prescribed by the Director-General.

Section 51. An observer shall perform the following duties:

(1) observe the catching of aquatic animals, the selecting and processing thereof, as well as other activities concerned therewith, and record data found in the observations;

(2) compile and record biological information and collect specimen of the aquatic animals caught and any other data useful for the purposes of traceability;

(3) prepare a summary report of actions taken pursuant to (1) and (2), to be submitted to the competent official upon berthing of the fishing vessel at a fishing port or when the observer returns to the coast in accordance with the procedures and timeframe prescribed by the Director-General.

Section 52. A holder of a license for fishing outside Thai waters must not engage in a fishing operation in Thai waters unless he/she also holds a license pursuant to section 36.

Section 53. The provisions under section 37, section 40, section 41 and section 42 shall also apply to fishing operations outside Thai waters *mutatis mutandis*.

Section 54. The owner of a Thai fishing vessel or the owner of a non-Thai fishing vessel with a master or a seaman or a passenger who is a Thai national utilizing or giving his/her consent to another to utilize his/her fishing vessel to undertake a fishing operation outside Thai waters which causes a violation of the law of a foreign state, and any such master, seaman or passenger on board is stranded abroad, shall be held responsible for all necessary advance expenses which the State has paid for the repatriation of any such person to the Kingdom within thirty days as from the date on which he/she receives a written notice from the Department of Fisheries.

In the case where the owner of the fishing vessel fails to reimburse the expenses within the period prescribed pursuant to paragraph one, the Department of Fisheries shall have the power to confiscate any such fishing vessel and have it sold by auction. After the sum of money to be reimbursed is deducted together with interest at seven and a half per cent per year payable as from the date on which the sum becomes due until the payment is made using the sum received through any such auction, the remainder shall be returned to the owner of the vessel.

Chapter 5**Conservation and Management Measures**

Section 55. For the purposes of conservation and management designed to achieve a natural balance and the preservation of aquatic animal resources and the ecosystem in a sustainable manner based on a precautionary approach, persons engaging in fishing operations must comply with the provisions under this chapter.

Section 56. No person shall catch aquatic animals in an aquatic species sanctuary as prescribed by the Minister or by the provincial fisheries committee subject to the approval of the Minister, except for the purposes of academic advancement or for the purposes of the nurturing of aquatic animal breeds for which permission in writing has been granted by the Director-General or a person assigned by the Director-General.

There shall be attached to a notification determining any aquatic species sanctuary pursuant to paragraph one a map delineating the areas prescribed thereby.

Section 57. No person shall catch aquatic animals or take aquatic animals of a size that is smaller than that prescribed by the Minister on board a fishing vessel.

Section 58. No person shall engage in the following acts:

- (1) releasing, pouring, disposing of, discharging or causing the passage of hazardous matters as prescribed by the Minister into a fishing ground;
- (2) acting in whichever way to cause the intoxication of aquatic animals in a fishing ground;
- (3) releasing, pouring, disposing of, discharging or causing the passage of any particular thing into a fishing ground in a manner harmful to aquatic animals;
- (4) causing a fishing ground to be polluted such that it becomes harmful to aquatic animals.

The provisions under paragraph one shall not apply to unavoidable acts for the benefit of military public service.

Section 59. Any person intentionally or through negligence causes a fishing ground to be polluted in a manner that may harm aquatic animals shall bear all the expenses incurred in rescuing or preventing the loss of aquatic animals' lives, and in restoring the fishing ground back to its natural state as prescribed by the Director-General.

Section 60. No person shall use electrical currents for fishing purposes or explosives in a fishing ground. Exemptions to the prohibition on the use of explosives in fishing grounds may be granted for the benefit of public service for which permission in writing must have been obtained from the Director-General, in which case preventive undertakings must have been implemented to preempt undue damage to the aquatic animals concerned.

The provision under paragraph one shall not apply to the use of explosives for the benefit of military public service.

Section 61. No person shall have in possession aquatic animals or aquatic animal products for commercial purposes knowing that these aquatic animals or aquatic animal products are acquired through wrongdoings pursuant to section 58, section 60, or acquired by a serious infringement under section 114, or from a fishing vessel used in IUU fishing as per the list of fishing vessels prohibited from entering the Kingdom pursuant to section 94, or as publicly listed under section 116.

Section 62. No person shall make alterations to a fishing ground that is public domain of State such that it is different from what it originally is unless permission in writing has been obtained from the competent official.

Section 63. No person shall install, place or build a damn, weir, dyke, fence, built structure, tool fitted with nets or any other fishing tool in a fishing ground, and thereby blocking the passage of aquatic animals or preempting the natural growth of aquatic animals, unless permission in writing has been obtained from the competent official.

The provisions under paragraph one shall not apply to undertakings implemented for the purposes of public disaster prevention or for official purposes relating to irrigation.

Section 64. No person shall have in possession aquatic animals or aquatic products that may cause harm to the human body or to other aquatic animals, aquatic animals' environs, private assets, public domain property, or aquatic products that may be harmful to human health in accordance with the types, kinds, features, numbers or sizes prescribed in the Ministerial Regulations.

Any person having aquatic animals or aquatic products under paragraph one in possession shall hand over such aquatic animals or aquatic products to the competent official within the period prescribed by the Minister. The competent official shall subsequently have any such aquatic animal or aquatic product destroyed without delay.

The provisions under paragraph one and paragraph two shall not apply to possession of aquatic animals or aquatic products by a public-sector entity for academic purposes.

Section 65. For the purposes of protecting rare aquatic animal species or preventing danger caused by an epidemic disease, the Minister shall have the power to prohibit the importation, exportation, bringing in transit, culturing or possession of any kind of aquatic animal.

No person shall import, export, bring in transit, breed or have in possession aquatic animals pursuant to paragraph one unless a license is obtained from the Director-General or a person designated by the Director-General.

Section 66. No person shall catch aquatic mammals, rare aquatic animals or aquatic animals near extinction as prescribed by the Minister or take any such aquatic animal on board a fishing vessel, except where it is necessary to do so in order to save the life thereof.

Section 67. No person shall use or have in possession for the purposes of using any of the following fishing gears:

(1) a set bag net, a *Rua Sai Man* bag net or *Kan Su Ruan Sai Man* bag net, a *Li* bamboo trap, or any other tool exhibiting a similar character and requiring a similar method;

(2) a foldable trap or an elongated collapsible trap (*Ai Ngo*) with left and right inlets alternating on the sides for the purposes of trapping aquatic animals;

(3) a trawl net with the size of the meshes round the bottom part as prescribed by Notification of the Director-General;

(4) a push net attached to a motor vessel with the exception of a push net for the catching of krill.

The provisions under paragraph one shall not apply to fishing gears which utilize the form, vessel size, fishing procedure, fishing area and conditions prescribed by the Director-General for the benefit of artisanal fisheries.

Section 68. Any person using a push net for the catching of krill fitted to a motor fishing vessel shall comply with the conditions prescribed by the Minister regarding the formats of nets, vessel sizes, operation methods in fishing, fishing areas or fishing period.

Section 69. No person shall use a surrounding net with the size of the net meshes smaller than two point five centimeters to engage in a fishing operation at night.

Section 70. No person shall engage in a fishing operation during a season of aquatic animals' ovulation and egg-spawning, larvae rearing or during any other period of time designated for the protection of aquatic animals as prescribed by the Minister.

Section 71. The Minister or the provincial fisheries committee shall have the power to issue notifications regarding the following:

(1) fishing gears according to their forms, fishing methods, fishing areas, the size of fishing vessels used in fishing operation and other conditions that are prohibited from fishing operations in fishing grounds;

(2) requirements to be complied with in relation to bycatches;

(3) an area necessitating the use of a fishing gear that requires pegging down, pitching, tying, stretching, pulling, sinking or any other method to keep any such tool fixed during a fishing session.

A notifications pursuant to paragraph one shall not apply to any action undertaken for the purposes of research or aquatic animal resource conservation by a public agency for which permission has been granted in writing by the Director-General or a person designated by the Director-General. In a case in which any such notification is issued for enforcement in a particular area, there shall be attached to any such notification a map delineating the area prescribed thereby.

Upon the approval of the Minister, the determination by the provincial fisheries committee shall apply to the areas under its responsibility and only to freshwater fisheries zones and coastal seas.

For the purposes of this section, the Minister shall have the power to issue notifications determining areas under the responsibility of the provincial fisheries committees in coastal sea areas.

Section 72. Where the issuance of any notification pursuant to section 71 involves overlapping areas in two or more provinces due to the geographical components or the natural ecosystem in that specific area, or for the purposes of achieving a systematic aquatic animal resource management system, the provincial fisheries committee shall propose to the Minister for the latter to exercise the power to determine any such matter in lieu of the provincial fisheries committee, and notify the provincial fisheries concerned thereof.

Chapter 6

Aquaculture Promotion

Section 73. The provisions of this Chapter aim to promote aquaculture as an alternative source of aquatic animal products in accordance with the overall objective of achieving long-term economic, social and environmental sustainability and ecosystem balance, whilst also ensuring the proper quality and hygienic standards for consumption.

Section 74. In order to ensure quality and safe consumption for the benefit of consumers of aquatic animals, an aquaculturist properly comply with the agricultural commodity standards prescribed by the Agricultural Commodity Standards Committee in accordance with the law on agricultural commodity standards.

It shall be a duty of the Department of Fisheries to promote, develop and provide guidance with respect to aquaculture in order to achieved standards pursuant to paragraph one without compromising the state of the ecological environment and the abundance of aquatic animal resources. The Department shall also issue a certificate certifying compliance to such standards on the part of an aquaculturist when requested.

Section 75. Any person wishing to request the certifying of aquaculture standard attainment prescribed under section 74, or request that the Department of Fisheries inspect and certify kinds, features, quality or origin of any aquatic animal, or analyze specimens of soil, water, aquatic animals or factors of production in any specific individual's case, shall lodge a request therefor and pay expenses for the issuance of any such certificate or for a verification in accordance with the Regulations prescribed by the Director-General.

Section 76. For the purposes of supervising the quality of aquaculture and to prevent environmental consequences or hazards to consumers or others' enterprises, a Ministerial Regulation may be issued to determine the kinds of aquatic animals or aquatic animals' features or types, forms or sizes or the objectives of aquaculture enterprises to be classified as those under aquaculture control.

Section 77. Subject to section 79, no person shall undertake an aquaculture enterprise under control outside the areas prescribed by the Provincial Fisheries Committee as aquaculture zones.

Section 78. The Director-General shall have the power to determine that an aquaculturist undertaking an aquaculture enterprise under control in aquaculture zones pursuant to section 77 shall comply with the following requirements:

- (1) an aquaculture entrepreneur shall have to give notify the aquaculture undertaking to the competent official as per the procedure prescribed;
- (2) determining the origins of aquatic animals prohibited for use in aquaculture;
- (3) determining the types, features, and quality of aquatic animals' feed prohibited in aquaculture;
- (4) determining kinds and quantities of any drug, chemical or hazardous matter prohibited in aquaculture;
- (5) determining criteria and operational methods in the management of effluent water or solid waste from aquaculture farms;

(6) determining rules and procedures for preventing leaks of water used in aquaculture from aquaculture grounds;

(7) determining any further matter necessary for the prevention of impacts to the environment, or danger to consumers or to others' enterprises.

Section 79. No person shall undertake a form of aquaculture in a fishing ground that is a public domain of the State unless a license therefor is granted by the competent official.

The provision under section 44 shall also apply to the transfer of any permit under paragraph one *mutatis mutandis*.

Chapter 7

Control, Surveillance, Traceability, and Inspection

Section 80. The provisions of this Chapter aim to achieve effective monitoring, surveillance and control of fishing activities and the implementation of an effective traceability system which enables the identification of the source of an aquatic animal or aquatic animal product at any stage from fishing operations to ultimate consumers.

In addition to the provisions in Chapter 3, Chapter 4, Chapter 5 and Chapter 9, the control, surveillance, traceability and inspection of the lawfulness of fishing operations shall be as provided in this Chapter.

Part 1

Control and Surveillance

Section 81. Any person wishing to use a commercial fishing vessel of a size prescribed by the Minister to engage in a fishing operation must undertake the following actions:

(1) having installed a fishing vessel monitoring system and maintained the functionality thereof at all times in accordance with the rules and procedures prescribed by the Director-General;

(2) prepare a fishing logbook, which shall at least comprise data on the types and quantities of aquatic animals caught, points at which the vessels have been anchored, aquatic animal transshipment, sale or discard of the aquatic animals, all of which shall have to be certified as true and

accurate by the master of the vessel; the data contained therein shall be reported to the Department of Fisheries at the time intervals and in accordance with the procedures prescribed by the Director-General;

(3) report every port-in and port-out operation to the Port In-Port Out Control Centre in accordance with the rules and procedures prescribed by the Director-General; upon entry into a port for the purpose of transshipping or landing aquatic animals or aquatic animal products at a fishing port, a copy of the fishing logbook and other documents as prescribed by the Director-General shall be submitted;

(4) affix a marking on the fishing vessel in accordance with the rules and procedures prescribed by the Director-General;

(5) return to the applicable designated port on a regular basis within the time period prescribed by the Director-General.

Section 82. Prior to proceeding with the port-out procedure pursuant to section 81, the owner or the master of a fishing vessel shall submit documents related to vessel registration, the vessel use permit, the fishing license, details of the number and a list of outgoing seamen on board, evidence of authorization, license and permit under section 83, as well as evidence related to the provision of appropriate systems for ensuring occupational safety, hygiene and wellbeing of seamen as prescribed in the Ministerial Regulation to the competent official at the Port In-Port Out Controlling Centre in accordance with the rules and procedures prescribed by the Director-General.

In the case where the owner or the master of a fishing vessel fails to submit the documents and evidence pursuant to paragraph one, or the provision of a system for ensuring occupational safety, hygiene and wellbeing of seamen does not comply with the requirements stated in the Ministerial Regulation, the competent official shall order the detention of the fishing vessel at the fishing port or order the return of the fishing vessel to the fishing port.

Section 83. A seaman must hold a seaman document issued under the law on navigation in Thai waters. In the case of a seaman who is not a Thai national, a permit to remain in the Kingdom under the law on immigration and a work license under the law on working of aliens must also be obtained.

For the purposes of administrative facilitation, the Director-General shall have the same powers as the Harbour Master under the law on navigation in Thai waters, with respect to the issuance of seaman documents, the Commissioner General of the Royal Thai Police under the law on immigration, with respect to the issuance of a permit for temporary stay in the Kingdom for aliens working on fishing

vessels, and the Registrar under the law on working of aliens, with respect to the licensing of aliens working on fishing vessels which engage in fishing operations at sea.

When granting a permit or license under paragraph three, the Director-General must comply with rules, procedures and conditions prescribed by the Council of Ministers. Upon issuance of a permit or license, the Marine Department, Royal Thai Police and Department of Employment must be notified accordingly. The foregoing provisions, however, does not prejudice the rights of a seaman to apply for a seaman document under the law on navigation in Thai waters or to apply for a permit or license under the law on immigration and law on working of aliens.

The Director-General shall have the power to issue a seaman document and evidence of licensing or permission to a seaman in accordance with the form prescribed by Notification of the Director-General. The seaman shall keep such evidence with himself/herself or at a safe place in the fishing vessel in which he/she is stationed.

The seaman document, permit or license issued under paragraph two shall only be valid for working on board the fishing vessel specified in the evidence document, in the vicinity of the fishing port, and only during the period specified therein.

Section 84. Any person wishing to use his/her own port as a fishing port shall register any such port as a fishing port with the Department of Fisheries, except where such a port is already a part of a fish market enterprise.

Section 85. The owner of a fishing port pursuant to section 84 or a fish market entrepreneur shall record data on every fishing vessel berthed at the port, or transshipment or landing of aquatic animals at the port. Such records shall be kept for inspection by the competent official in accordance with the particulars, procedures and timeframe prescribed by the Director-General.

The owner of any such fishing port or fish market enterprise shall collect and submit such reports on port-in and port-out operations of vessels pursuant to section 81 to the Port-In and Port-Out Control Centre in accordance with the procedures prescribed by the Director-General.

Section 86. Subject to section 87, no fishing vessel engaged in commercial fishing shall transship or land aquatic animals at any fishing port other than a fishing port pursuant to section 84 or at a site that is a fish market, as designated by Notification of the Director General.

The Notification of the Director-General under paragraph one may also specify the fishing vessel size that is allowed to transship or land aquatic animals at particular ports.

The owner of a fishing port or a fish market enterprise pursuant to paragraph one shall prepare a marine catch purchasing document in accordance with the form and particulars prescribed by the

Director-General. A copy thereof shall be submitted to the Department of Fisheries in accordance with the timeframe and procedures prescribed by the Director-General.

Section 87. No transshipment of aquatic animals shall be made at sea with the exception of a transshipment onto a fishing vessel registered as a carrier for the transshipment of aquatic animals or a vessel for the storage of aquatic animals, in which case the owner or master of the fishing vessel must obtain permission from the a competent official by radio transmission or a similar means of communication as well as submit a transshipment declaration certified as true and accurate by the master of fishing vessel to the competent official after completion of transshipment.

An application for permission and the submission of a transshipment declaration shall be in accordance with the rules, procedures and time period prescribed by the Director-General

The provisions of section 39 shall apply to the registration of a carrier vessel under paragraph one *mutatis mutandis*.

For the purposes of preventing and combatting IUU fishing, the Director-General shall have the power to prohibit transshipments at sea for certain or all vessels in the specified areas and time periods.

Section 88. Any person wishing to use a fishing vessel registered as a carrier for the transshipment of aquatic animals or as a vessel for the storage of aquatic animals to transship aquatic animals must take the following actions:

(1) having installed a fishing vessel monitoring system and maintained the functionality thereof at all times in accordance with the rules and procedures prescribed by the Director-General;

(2) prepare a marine catch transshipment document; the data contained therein shall be certified as true and accurate by the master of the carrier vessel and reported to the Department of Fisheries at the time and in accordance with procedures prescribed by the Director-General;

(3) report every port-in and port-out operation to the Port In-Port Out Control Centre in accordance with the rules and procedures prescribed by the Director-General.

Section 89. In addition to compliance with this Royal Ordinance, a fishing vessel registered as a carrier for the transshipment of aquatic animals or as a vessel for the storage of aquatic animals shall also comply with the laws, rules or regulations of a coastal state concerned when transshipping aquatic animals in a sea lying within the jurisdiction of any such coastal state. It shall also comply with the rules or regulations of the relevant international organisation when transshipping aquatic animals on the high seas.

Evidence for the Purposes of Traceability

Section 90. For the purposes of traceability related to the lawfulness of aquatic animals or aquatic animal products obtained from fisheries activities, parties concerned shall collect and prepare evidence to be used for inspection in accordance with the following rules:

(1) the owner of a vessel or the master of a fishing vessel shall prepare a fishing logbook, and submit a report to the Department of Fisheries as prescribed under section 81(2);

(2) the owner or the master of a carrier for the transshipment of aquatic animals or the storage of aquatic animals shall prepare a marine catch transshipment document, and submit a report to the Department of Fisheries as prescribed under section 88(2);

(3) the owner of a fishing port or a fish market entrepreneur shall prepare a marine catch purchasing document for a buyer as per the form and particulars prescribed by the Director-General; a copy of such a certificate shall be submitted to the Department of Fisheries as prescribed pursuant to section 86 paragraph three;

(4) a buyer of aquatic animals from a fishing port or from a fish market entrepreneur pursuant to (3) shall fill in data in a marine catch purchasing document pursuant to (3) when selling or delivering aquatic animals to another person;

(5) a producer of aquatic animals or a processor of aquatic animals shall prepare evidence for traceability purposes in accordance with the rules and procedures prescribed by the Director-General;

(6) an importer, exporter or person who brings in transit aquatic animals and aquatic animal products shall present a catch certificate, or any other document to prove that the aquatic animals and aquatic animal products are obtained from a lawful fishing operation as provided in section 92, whichever is applicable.

Section 91. For the purposes of establishing the source of aquatic animals and aquatic animal products obtained from aquaculture, the Director-General shall have the power to prescribe that an entrepreneur of aquaculture under control pursuant to section 76 shall prepare a marine catch purchasing document for his/her buyers in accordance with the form and particulars provided by the Director-General.

Each time a buyer of aquatic animals pursuant to paragraph one sells or delivers such aquatic animals to another person, relevant data shall be filled in the form as per paragraph one, with the name of the buyer or the person the aquatic animals are delivered to specified.

Section 92. Subject to section 96, no person shall import aquatic animals and aquatic animal products unless permission is obtained from a competent official.

Any person wishing to export or bring in transit aquatic animals and aquatic animal products shall first produce a catch certificate or any other document which proves that such aquatic animals and aquatic animal products are obtained from a legal fishing operation to the competent official for inspection.

The granting of permission pursuant to paragraph one shall be executed only when a catch certificate or any other document is presented proving that such aquatic animals and aquatic animal products are obtained from a lawful fishing operation.

The requesting and granting of permission pursuant to paragraph one shall be in accordance with the rules, procedures and conditions prescribed by the Director-General.

The provision under paragraph one shall not apply to the bringing of aquatic animals caught by a Thai fishing vessel in a lawful fishing operation into the Kingdom. Any such case shall not be regarded as importation.

Section 93. Any exporter of aquatic animals and aquatic animal products wishing to request a catch certificate, or an aquatic animal product production or processing certificate, shall lodge such a request to the Department of Fisheries in accordance with the forms and procedures, and pay the fees for the issuance of any such certificate as prescribed by regulation issued by the Director-General.

Part 3

Inspection Measures

Section 94. No person shall bring a non-Thai fishing vessel that has undertaken IUU fishing into the Kingdom.

The Director-General shall have the power to publically issue a list of non-Thai fishing vessels that have undertaken IUU fishing based on the lists of IUU fishing vessels published by a foreign state or international organisation.

Section 95. A non-Thai fishing vessel wishing to import aquatic animals and aquatic animal products into the Kingdom shall notify the competent official by no less than forty-eight hours in advance prior to its arrival at a port of entry. Data in the notice and ports of entry shall be as designated by the Minister.

The competent official shall verify the data pursuant to paragraph one and notify the master of the vessel of the result within twenty-four hours after having been notified of the request for a berthing.

In the case where a non-Thai fishing vessel fails to comply with the rules under paragraph one, or where there is a cause for suspicion that the fishing vessel in question has undertaken IUU fishing or has been involved in IUU fishing, the competent official shall not allow the requested berthing with the exception of reasons related to the safety of crewmen or of the fishing vessel, or in light of a *force majeure* case.

Section 96. When a fishing vessel has been authorized to berth at a port pursuant to section 95 and has completed berthing, a request for permission for the importation of aquatic animals shall or aquatic animal products be lodged. After permission therefor has been granted, aquatic animals or aquatic animal products may then be unloaded from the fishing vessel.

The competent official shall not permit any importation under paragraph one unless the owner of the vessel or the master of the vessel can prove that:

(1) the fishing vessel has been granted a fishing license or a license for activities related to fisheries issued by a flag state or a coastal state;

(2) the fishing vessel can produce evidence to prove that it has not undertaken IUU fishing;

(3) the owner of the vessel or the master of the vessel certifies in writing that the flag state shall certify in due course that the aquatic animals caught in accordance with the regulations of the international organisations concerned.

In a case in which the owner of the vessel or the master of the vessel cannot prove as per paragraph two, the Director-General shall have the power to order that the fishing vessel leave the Kingdom within a period of time prescribed and notify the flag state or any other country concerned and international organisations thereof. In the case where the fishing vessel does not leave the Kingdom within the period of time prescribed or when there exists clear evidence that the fishing vessel has undertaken IUU fishing, or in a case in which the fishing vessel is a stateless vessel, the Director-General shall have the power to order that the fishing vessel and all the properties on board any such vessel be confiscated and put up for sale by auction or destroyed. The proceeds of sale by auction shall, after deduction of expenses related to that sale and other expenses, be seized by the Department of Fisheries until the owner of the vessel or master of the vessel is able to provide proof under paragraph two. If the owner of the vessel or master of the vessel is unable to provide such proof within one year of the sale by auction, the proceeds of sale shall vest in the state, unless otherwise ordered by the court.

The sale by auction as per paragraph three shall not involve any aquatic animals or aquatic animal products. In this regard, the Director-General shall have the power to order the destruction

thereof or have appropriate arrangements made with a view to distributing them to impoverished or underprivileged members of the public without any charge.

In a case in which a fishing vessel is unable to produce evidence pursuant to paragraph two, but there is no clear evidence to prove that it has undertaken IUU fishing prior to its berthing at the port, the competent official may allow access to fuel and food provisions or maintenance services as necessary.

Section 97. The Minister may issue a notification to prescribe that a fishing vessel of a flag state which shares a border with the Kingdom of Thailand undertaking artisanal fishing does not have to comply with all or certain provisions under section 95 and section 96. In this regard, the Minister shall also have the power to determine a guideline for such vessels to comply with in order to prevent IUU fishing.

Chapter 8

Hygiene Standards of Aquatic Animals or Aquatic Products

Section 98. It shall be a duty of the Department of Fisheries to develop hygiene standards relating to the catching, caretaking, and processing of aquatic animals, and the storage, transportation or transshipment of aquatic animals and animal products, which are to be promoted among fisheries entrepreneurs so that they apply such standards in their business operations in order to obtain aquatic animals and aquatic animal products that guarantees a quality level with respect to hygiene standards and safety for consumers.

The determination of standards pursuant to paragraph one shall be in line with international standards.

For the purposes of promoting and encouraging fisheries entrepreneurs to conform to standards pursuant to paragraph one, the Director-General or a person assigned by the Director-General shall issue a certificate to an applicant who has attained such standards as requested.

A request for a certificate pursuant to paragraph three shall be as prescribed by the Director-General. In this regard, expenses for the issuance of any such certificate may also be stipulated as required.

Section 99. For the purposes of complying with Thailand's existing international obligations, the Minister may issue a notification prescribing that entrepreneurs undertaking all forms of

fisheries business or a certain form of fisheries business, or producers of all kinds of aquatic animal products or certain kinds of aquatic animal products must conform to the standards pursuant to section 98.

Where a fisheries entrepreneur or a producer of aquatic animal products covered in a notification pursuant to paragraph one fails to conform to the standards, the competent official shall have the power to order that any such fisheries entrepreneur or producer of aquatic animal products rectify the matter or cease operation over a prescribed period of time as deemed fit.

Section 100. When it emerges that a particular fishing ground is faced with a state of pollution or contamination involving toxins or any other matter potentially harmful to human beings or to aquatic animals to a degree exceeding the standards prescribed by the competent official, the Director-General shall have the power to prohibit fisheries operation in such a fishing ground over a period of time prescribed.

Chapter 9

Competent Officials

Section 101. The provisions of this Chapter aim to provide competent officials with sufficient powers for the implementation of this Royal Ordinance, in particular with regard to the exercise of effective monitoring, control and surveillance functions, as well as to ensure that complete and accurate data concerning fisheries activities are collected.

Section 102. When performing duties pursuant to this Royal Ordinance, the competent official shall have the following powers:

(1) issue a letter of summons to a licensee, company director, manager, person authorized to exercise managerial functions or the licensee's employee concerned, to give a statement or supply relevant documents or evidence for the deliberation of matters pursuant to this Royal Ordinance;

(2) enter enterprise premises or place related to the functioning of the licensee's enterprise or place related to the importation, exportation, transit, sale, production or processing of aquatic animals or aquatic animal products during working hours in order to exercise inspection and control to ensure compliance with this Royal Ordinance;

(3) enter enterprise premises or place related to the functioning of enterprises under control in accordance with section 76 during their working hours in order to exercise inspection and control to ensure compliance with this Royal Ordinance;

(4) control a fishing vessel, stop a fishing vessel or a fishing or transshipment operation, or order a fishing vessel master to berth the fishing vessel at a port, or to embark a fishing vessel, or enter any fishing ground in order to exercise inspection and control to ensure compliance with this Royal Ordinance; where there is reasonable cause for suspicion that an offence under this Royal Ordinance has been committed;

(5) conduct a search pursuant to the Criminal Procedure Code between sunrise and sunset or during the working hours where there is reasonable cause for suspicion that an offence under this Royal Ordinance has been committed;

(6) seize or attach any document or evidence related to the commission of an offence under this Royal Ordinance for the purposes of an investigation or legal proceedings;

(7) collect specimens of aquatic animals or aquatic animal products or any matter for inspection or analysis in order to exercise inspection and control to ensure compliance with this Royal Ordinance;

(8) seize or attaching aquatic animals or aquatic animal products where there is reasonable cause for suspicion that they are aquatic animals or aquatic animal products the possession of which is subject to prohibition pursuant to section 64 or section 65;

(9) seize or attach drugs, chemicals or any other hazardous substance where there is reasonable cause for suspicion that that they are drugs, chemicals or any other hazardous substance used or to be used in aquaculture in violation of the proscription(s) pursuant to section 78(4).

Where aquatic animals or aquatic animal products, drugs, chemicals or any hazardous substance seized or attached by the competent official pursuant to (8) or (9) are of conditions potentially harmful to the human body or to other aquatic animals or aquatic animals' environs or to private assets or public domain property, the Director-General shall have the power to have these destroyed or handled otherwise as deemed appropriate.

After having entered the premises and inspected matters pursuant to (2) or (3) or having conducted a search pursuant to (5), if any such undertaking has not been completed, the competent official may continue conducting such an undertaking into nighttime or outside the working hours of such an enterprise.

The Director-General shall have the power to set forth operational regulations pursuant to (2), (3), (4), (5), (6), (7), (8) and (9) for compliance by a competent official.

During the performance of duties by a competent official pursuant to paragraph one and paragraph two, the licensee or persons concerned shall cooperate with the competent official as appropriate.

Section 103. The competent official shall have the power to order that any person having installed a fishing gear, built structure, or anything in a fishing ground without authorisation, or where authorised, failing to correctly implement the authorized installation/structure, or having implemented any such authorized installation/structure differently from the conditions prescribed in the license or permit, have any such installation/structure dismantled or rectified as per authorized within a stipulated period of time.

Where the person receiving any such order fails to comply with the order within the time period specified pursuant to paragraph one, the competent official shall have the power to make necessary arrangements for any such fishing gear, built structure or any such thing to be dismantled or destroyed. Expenses incurred in the course of any such undertaking shall be borne by the person receiving the order.

Section 104. Subject to international law, and in fulfillment of all obligations or agreements which the Kingdom of Thailand has concluded with international organisations at all levels, the competent official shall, upon the request of the government official of a relevant State having jurisdiction or of an international organisation having control over fishing operation in an area concerned, have the power and enjoy immunity in order to get on board any stateless vessel or a fishing vessel found to be undertaking IUU fishing outside Thai waters for inspection and for the execution of his/her duties.

When boarding a fishing vessel for inspection pursuant to paragraph one, the competent official shall observe the rules prescribed by the Minister. Such rules shall take into account rules accepted as international guidelines and recognized by the United Nations. In this regard, the provision under section 105(1) shall apply *mutatis mutandis*, and the flag state or international organisations concerned shall be notified accordingly.

Section 105. Where there is credible evidence that a fishing vessel or a fisheries entrepreneur has committed an offence or has been involved in an offence pursuant to this Royal Ordinance, the competent official shall take the following actions:

(1) record data on the suspected violation in the inspection findings report, collect all evidence relating to the suspected violation, as well as submit the inspection findings report to the Director-General or a person designated by the Director-General;

(2) order the confiscation of fishing gears, aquatic animals or aquatic animal products held or obtained from an IUU fishing operation, or order the detention of the fishing vessel until the matter has been deliberated upon and an order thereon has been made pursuant to Chapter 10 or chapter 11.

Section 106. The Director-General shall have the power to appoint a member of a local fishing community organisation registered pursuant to section 25(2) to assist in the performance of duties of the competent official pursuant to this Royal Ordinance.

The person appointed pursuant to paragraph one shall have the duty of assisting the competent official's performance of duties in accordance with this Royal Ordinance as requested or determined by the competent official.

The rules, procedures and conditions for the appointment, performance of duties and the identification card of a person appointed pursuant to paragraph one shall be as prescribed by the Director-General.

When performing duties, a person appointed under paragraph one shall present his/her identity card to parties concerned every time.

Section 107. It shall be a duty of the Director-General to ensure that competent officials are available to perform their duties pursuant to Royal Ordinance at all times. In a case in which a person requests a service outside the official working hours or outside the normal office premises, any such person shall pay an additional fee and a special charge pursuant to the rate prescribed by the Director-General.

Section 108. When performing duties pursuant to this Royal Ordinance, the competent official shall present his/her identity card to the licensee or person concerned.

The competent official's identification card shall be in accordance with the form prescribed by the Minister.

Section 109. When performing duties pursuant to this Royal Ordinance, the competent official shall be officers pursuant to the Criminal Code.

For the purposes of making arrests of offenders pursuant to this Royal Ordinance, a competent official shall be regarded as an administrative officer or a police officer pursuant to the Criminal Procedure Code.

Chapter 10

Administrative Measures

Section 110. The provisions of this Chapter aim to provide adequate administrative measures to ensure expeditious and effective compliance with this Royal Ordinance as well as to supplement criminal sanctions that are provided in Chapter 11, and also to list, in line with international standards, those offenses that shall be considered severe infringements.

Section 111. If any licensee or permit holder violates or fails to comply with this Royal Ordinance, Ministerial Regulations, Notifications or Directives issued pursuant to the provisions in this Royal Ordinance or the conditions specified in the license or permit, the official authorized to issue any such license or permit shall have the power to issue an order that any such license be suspended or any such permission be ceased over a period of time not exceeding ninety days.

In a case in which a licensee or permit holder under section 60, section 62, section 63 and section 79 re-commits a violation of rules or conditions pursuant to paragraph one, the official authorized to issue any such license or permit shall have the power to issue an order that any such license or permission be revoked.

Section 112. If the owner of a fishing port, a fish market entrepreneur or the owner of a vessel registered as a carrier for the transshipment of aquatic animals or the storage of aquatic animals violates or fails to comply with this Royal Ordinance, or Ministerial Regulation, Notifications or Directives issued pursuant to this Royal Ordinance, the Director-General shall have the power to order that any such registration be revoked.

Section 113. The Director-General shall have the power to issue the following orders against any person engaging in a fishing operation which constitutes a serious infringement:

(1) seizure of the aquatic animals and aquatic animal products obtained from any such fishing operation or seizure of fishing gear;

(2) prohibition of any fishing activity until full compliance is achieved;

(3) suspension of license for a period not exceeding ninety days each time; in this regard, an order may also be issued to prohibit the use of any such fishing vessel until the license suspension period expires;

(4) revocation of license and publicly listing the fishing vessel as a vessel used in IUU fishing;

(5) detention of any such fishing vessel or demanding that a security be deposited where such infringing fishing vessel is a non-Thai fishing vessel.

When seizing aquatic animals or aquatic animal products pursuant to (1), the Director-General may order the owner or master of the vessel to take care of and store the aquatic animals and aquatic animal products on board the vessel in the same conditions.

When issuing an order pursuant to paragraph one, the Director-General shall take into account the severity of the infringement, recidivism and the prevention of recidivism.

Section 114. The following acts shall be regarded as fishing operations constituting severe infringements pursuant to section 113:

- (1) use of a stateless vessel to engage in a fishing operation pursuant to section 10;
- (2) fishing without a fishing license or a license for the use of a fishing gear pursuant to section 31, section 32, section 35, section 36 or section 48;
- (3) failure to comply with section 81;
- (4) preparing a fishing logbook or reporting a fishing operation based on a false document or destroying a document or evidence related to the commission of an offence;
- (5) fishing in excess of the quantities or the condition prescribed in section 36, fishing in a prohibited area pursuant to section 56, or fishing during a prohibited period pursuant to section 70;
- (6) modification of a fishing gear under section 42, or use of a prohibited fishing gear pursuant to section 67, section 68, section 69 or section 71(1);
- (7) fishing in violation of rules prescribed by a coastal state or an international organisation pursuant to section 49;
- (8) catching aquatic animals or taking aquatic animals of a smaller size than that prescribed onto a fishing vessel pursuant to section 57;
- (9) catching aquatic animals or taking aquatic animals prescribed onto a fishing vessel pursuant to section 66;
- (10) transshipping aquatic animals and aquatic animal products in violation of the rules under section 87, section 88 or section 89;
- (11) falsifying, concealing or changing a vessel's mark or registration;
- (12) obstructing the performance of duties by a competent official or observer, or concealing, tempering with or disposing of evidence relating to an investigation conducted by a competent official;
- (13) participating in, providing support to or securing essential basics to a fishing vessel undertaking IUU fishing;
- (14) committing more than three offences other than those stated under (1) to (13) above within any one-year period, regardless of whether or not the offences are identical.

Section 115. Any licensee who disagrees with an order to suspend a license, cessation of permission or revocation of license pursuant to section 111, revocation of a registration pursuant to section 112, or an order given pursuant to section 113, may file an appeal to the following persons within thirty days as from the day he/she is notified of the order:

(1) where a competent official is the person who issues any such order, an appeal may be filed to the Director-General;

(2) where the Director-General is the person who issues any such order, an appeal may be filed to the Minister.

The Director-General or the Minister shall determine the appeal under paragraph one within sixty days as from the day the appeal is received.

An appeal against an order under paragraph one shall not constitute a stay of execution of the order with the exception of a case in which the Director-General or the Minister, as the case may be, issues an order for a temporary stay of execution thereof.

A decision of the Director-General or Minister shall be final.

Section 116. The Minister shall publish the names of fishing vessels used in IUU fishing, and may also order that the vessel registrar under the law on Thai vessels have the fishing registration of any such vessel revoked. When the Minister publishes such list of fishing vessels or issues a registration revocation order, no person shall use any such listed vessel for fishing for a period of time as prescribed by the Minister, which shall last no less than two years as from the date on which the publication was made. During any such period, the owner of a fishing port or a fish market enterprise shall not allow any such fishing vessel to land aquatic animals at his/her fishing port or fish market.

Section 117. The notification of a list of fishing vessels pursuant to section 116 shall at least contain the following particulars:

- (1) the current name and previous name of the fishing vessel;
- (2) the flag of the fishing vessel and the flag designating the previous nationality of the fishing vessel;
- (3) the owner of the vessel, the previous owner of the vessel concerned, and the beneficiary of the said vessel;
- (4) the vessel's registration number or designated number issued by a relevant international organisation and that issued by the Marine Department;
- (5) a photo thereof;
- (6) the date on which the vessel is included on the list of vessels;
- (7) the offence causing the listing of the vessel;
- (8) the period of time during which the registration of the vessel for fishing purposes is revoked.

Section 118. The Department of Fisheries shall notify the list of fishing vessels issued by the Minister pursuant to section 116 to the Food and Agriculture Organisation of the United Nations and international organisations.

Section 119. The Minister may have the name of a vessel removed from the list of vessels undertaking IUU fishing when:

(1) the owner of the vessel has presented evidence to prove that the fishing vessel has not been involved in IUU fishing;

(2) the fishing vessel has capsized or has been destroyed;

(3) a period of not less than two years has lapsed since the fishing vessel was included in the list and no further report has been received that the fishing vessel has been involved in IUU fishing;

(4) the owner of the vessel has presented evidence proving that corrections have been made such that the vessel is capable of engaging in lawful fishing or has completely removed all unlawful components;

(5) the owner of the vessel has satisfactorily presented evidence that he/she has not had a part or has not been involved in IUU fishing in whatsoever way, and has put in place appropriate preventive measures.

Section 120. Where the license expires or where the licensee is subject to the revocation of his/her license or permit pursuant to 111 or section 113, the licensee shall dismantle or destroy the fishing tool, structure or anything belonging to him/her in the fishing ground within thirty days as from the date on which the license expires or the date he/she is notified of the order revoking the license or permit, as the case may be. The provisions under paragraph two of section 103 shall be applied *mutatis mutandis*.

Chapter 11

Sanctions

Section 121. The provisions of this Chapter aim to provide criminal sanctions which are adequate in severity to be effective in securing compliance and to discourage violations wherever they occur and to deprive offenders of the benefits accruing from their illegal activities.

Section 122. A person engaged in a fishing occupation or a person involved in fisheries who violates section 9 paragraph three shall be subject to a fine not exceeding two thousand baht.

Section 123. Any person violating section 10 shall be subject to a fine of between ten thousand baht and one hundred thousand baht, or to a fine of three times the value of the aquatic animals obtained through the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from ten gross tonnage up to less than twenty gross tonnage shall be subject to a fine of between one hundred thousand baht and two hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between two hundred thousand baht and six hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of between six hundred thousand baht and five million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of between five million baht and thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 124. Any person who violates section 11 paragraph one shall be subject to a fine of four hundred thousand baht to eight hundred thousand baht per each unlawfully employed person.

Any person who operates a factory in violation of section 11 paragraph two, paragraph three or paragraph four shall be liable to a term of imprisonment not exceeding two years or to a fine of two hundred thousand baht or two million baht, or both, and a daily fine of one hundred thousand baht to five hundred thousand baht per day for the entire duration of the violation.

Section 125. Any person violating section 31 paragraph one or section 32 paragraph one shall be subject to a fine of between ten thousand baht and one hundred thousand baht, or to a fine of three times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 126. Any person undertaking artisanal fishing in violation of section 33 shall be subject to a fine not exceeding five thousand baht.

Section 127. Any person violating section 34 shall be subject to a fine of between fifty thousand baht and five hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 128. Any person violating section 35 shall be subject to a fine of between ten thousand baht and five hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained through the fishing operation. In whichever case, the higher fine shall apply.

Section 129. Any person violating section 36 paragraph one shall be subject to a fine of between one hundred thousand baht and two hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between two hundred thousand baht and six hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of between six hundred thousand baht and six million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of six million baht to thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 130. Any person violating section 38, section 43 or section 52 shall be subject to a fine of between one hundred thousand baht and two hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between two hundred thousand baht and six hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of between six hundred thousand baht and six million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of six million baht to thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 131. Any person violating section 41 paragraph one shall be subject to a fine not exceeding one hundred thousand baht.

Section 132. Any person violating section 42 shall be subject to a fine of between one hundred thousand baht and two hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between two hundred thousand baht and six hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of between six hundred thousand baht and six million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of six million baht to thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 133. Any person violating section 48 paragraph one shall be subject to a fine of between two million baht and ten million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of between ten million baht and twenty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of between twenty million baht and thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 134. Any person violating section 49 shall be subject to a fine of between two million baht and ten million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of between ten million baht and twenty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of between twenty million baht and thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 135. Any person who engages in a fishing operation which fails to comply with section 50 shall be subject to a fine of one million baht.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of two million baht.

Section 136. Any observer failing to perform their duties pursuant to section 51 or committing malfeasance in order to cause damage to any other person shall be subject to a term of imprisonment of between one month and two years or to a fine of between one hundred thousand baht and two million baht, or both.

Section 137. The owner of a fishing vessel failing to reimburse the expenses pursuant to section 54 shall be subject to a term of imprisonment not exceeding two years or to a fine of between two hundred thousand baht and two million baht or to a fine twice the amount of repatriation expenses under section 54, in whichever case the higher fine shall apply, or both.

Section 138. Any person violating section 56 or section 70 shall be subject to a fine of between five thousand baht and fifty thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from ten gross tonnage up to less than twenty gross tonnage shall be subject to a fine of between fifty thousand baht and one hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between one hundred thousand baht

and five hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage to one hundred and fifty gross tonnage shall be subject to a fine of between five hundred thousand baht and five million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of five million baht to thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 139. Any person violating section 57 shall be subject to a fine of ten thousand baht to one hundred thousand baht or five times the value of the aquatic animals obtained from the fishing operation. In whichever case the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from ten gross tonnage up to less than twenty gross tonnage shall be subject to a fine of between one hundred thousand baht and two hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between two hundred thousand baht and six hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage to one hundred and fifty gross tonnage shall be subject to a fine of between six hundred thousand baht and five million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of five million baht to thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 140. Any person violating section 58 shall be subject to a fine of between three hundred thousand baht and five hundred thousand baht.

Section 141. Any person violating section 60 shall be subject to a fine of between two hundred thousand baht and one million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 142. Any person violating section 61 shall be subject to a fine of two hundred thousand baht to one million baht or five times the value of the aquatic animals held in possession. In whichever case the higher fine shall apply.

Section 143. Any person violating section 62 or section 63 shall be subject to a fine of between ten thousand baht and one million baht and shall dismantle any such structure or fitting or restore the fishing ground back to its normal state, or pay the compensation expenses for the dismantling thereof or the restoration of the fishing ground back to the natural state to the State in the amount the State has actually paid therefor.

Section 144. Any person violating section 64 or section 65 paragraph two shall be subject to a term of imprisonment not exceeding one year, or to a fine not exceeding one million baht, or both.

An offender pursuant to paragraph one taking and releasing aquatic animals in a fishing ground shall be subject to a term of imprisonment not exceeding two years, or to a fine not exceeding two million baht, or both.

Section 145. Any person violating section 66 shall be subject to a fine of between three hundred thousand baht and three million baht, or to a fine of five times the value of the aquatic animals caught or brought on board a fishing vessel concerned. In whichever case, the higher fine shall apply.

Section 146. Any person violating section 67(1) shall be subject to a fine of between one hundred thousand baht and five hundred thousand, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 147. Any person violating section 67(2), (3) or (4), section 69 or section 71 shall be subject to a fine of between ten thousand baht to one hundred thousand baht or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from ten gross tonnage up to less than twenty gross tonnage shall be subject to a fine of between one hundred thousand baht to two hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between two hundred thousand baht

to six hundred thousand baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage to one hundred and fifty gross tonnage shall be subject to a fine of between six hundred thousand baht to six million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of six million baht to thirty million baht, or to a fine of five times the value of the aquatic animals obtained from the fishing operation. In whichever case, the higher fine shall apply.

Section 148. Any person failing to comply with section 68 shall be subject to a fine of three times the value of the aquatic animals obtained from the fishing operation.

Section 149. Any person violating section 77 or section 79, or failing to comply with section 78(1), (5), (6) or (7) shall be subject to a fine of between ten thousand baht and one hundred thousand baht, and a daily fine of ten thousand baht throughout the time during which any such violation occurs, as well as undertake action to restore or pay for the restoration of the fishing ground in question or the environment affected by any such undertaking back to its natural state.

Section 150. Any person violating section 78(2), (3) or (4) shall be subject to a fine of between thirty thousand baht and three hundred thousand baht.

Section 151. Any person violating section 81(1) or (4) and section 88(1) shall be subject to a fine of twenty thousand baht.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of two hundred thousand baht.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of one million baht.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of four million baht.

Section 152. Any person undertaking a fishing operation or transshipping aquatic animals without reporting in accordance with the rules prescribed under section 81(2) or (3), section 82, or section 88(2) or (3), or reporting false data, or failing to return to a designated port as provided under section 81(5), shall be subject to a fine of ten thousand baht.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of one hundred thousand baht.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of five hundred thousand baht.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of two million baht.

Section 153. The owner of any fishing vessel making use of a seaman without a license or permit pursuant to section 83 shall be subject to a fine of between four hundred thousand baht and eight hundred thousand baht per seaman, and the Director-General shall order the revocation of the owner's fishing license, and the Director-General of the Marine Department shall also revoke the seaman document of the master of the vessel pursuant to the law on navigation in Thai waters.

Section 154. Any person failing to comply with section 84 or section 85 shall be subject to a fine from one hundred thousand baht to one million baht.

Section 155. Any person violating section 86 paragraph one, section 87 or failing to comply with section 89 shall be subject to a fine of between ten thousand baht and one hundred thousand baht, or to a fine of five times the value of the aquatic animals transshipped. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between one hundred thousand baht and five hundred thousand baht, or to a fine of five times the value of the aquatic animals transshipped. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of between five hundred thousand baht and five million baht, or to a fine of five times the value of the aquatic animals transshipped. In whichever case, the higher fine shall apply.

Any offender pursuant to paragraph one using a vessel of a size from hundred and fifty gross tonnage onwards shall be subject to a fine of between five million baht and twenty-five million baht, or to a fine of five times the value of the aquatic animals transshipped. In whichever case, the higher fine shall apply.

Section 156. The owner of a fishing port or a fish market entrepreneur, an entrepreneur of an aquaculture business under control, or a buyer buying aquatic animals from any such person, who fails to prepare a marine catch purchasing document or prepares a document or fills in data which is false shall be subject to a fine of between ten thousand baht and one million baht.

Section 157. Any producer or processor of aquatic animal product failing to prepare evidence for the purposes of traceability or prepare evidence for the purposes of traceability based on false data shall be subject to a fine of between one hundred thousand baht and two million baht.

Section 158. Any person violating section 92 paragraph one or producing a false catch certificate or any other false document pursuant to section 92 paragraph two shall be subject to a fine of five times the value of the animals imported, exported or transited.

Section 159. Any person violating section 94 paragraph one or failing to comply with section 96 shall be subject to a fine of between one million baht and thirty million baht, or a fine of five times the value of the aquatic animals or aquatic animal products. In whichever case, the higher fine shall apply.

Section 160. Any person failing to comply with the guidelines prescribed by the Minister pursuant to section 97 shall be subject to a fine of between ten thousand baht and three hundred thousand baht, or to a fine of three times the value of the aquatic animals or aquatic animal products concerned. In whichever case, the higher fine shall apply.

Section 161. Any person violating section 100 shall be subject to a term of imprisonment not exceeding one year, or to a fine not exceeding one million baht, or both.

Section 162. Any person failing to comply with a letter of summons issued by the competent official issued pursuant to section 102(1), or fails to facilitate a competent official pursuant to section 102 paragraph five, or violating an order of the Director-General issued pursuant to section 113(2) shall be subject to a fine between ten thousand baht and fifty thousand baht.

In the case where an offender under paragraph one is a juristic person, such juristic person shall be subject to a fine between one hundred thousand baht and one million baht.

In the case where a violation of an order of the Director-General issued pursuant to section 113(2) pertains to the use of a vessel from ten gross tonnage onwards, an additional fine shall be levied in the amount of ten thousand baht per gross tonnage in excess of ten gross tonnage.

Section 163. Any person obstructing the performance of duties by an observer shall be subject to a term of imprisonment between one month and one year, or to a fine between one hundred thousand baht and one million baht, or both.

Section 164. Any person disclosing to another person information obtained from a vessel monitoring system or a fishing log book which should normally be kept confidential, shall be subject to a term of imprisonment between one month and one year, or to a fine between one hundred thousand and one million baht, or both.

The provisions under paragraph one shall not apply to the disclosure of such information in the performance of official powers and duties or any disclosure made to the public service or to a domestic or foreign agency exercising functions relating to the monitoring and control of fishing operations.

Section 165. Any person falsifying, concealing or changing a fishing vessel's mark or registration shall be subject to a fine of between ten thousand baht and one hundred thousand baht.

Any offender pursuant to paragraph one using a vessel of a size from ten gross tonnage up to less than twenty gross tonnage shall be subject to a fine of between one hundred thousand baht and two hundred thousand baht.

Any offender pursuant to paragraph one using a vessel of a size from twenty gross tonnage up to less than sixty gross tonnage shall be subject to a fine of between two hundred thousand baht and six hundred thousand baht.

Any offender pursuant to paragraph one using a vessel of a size from sixty gross tonnage up to less than one hundred and fifty gross tonnage shall be subject to a fine of between six hundred thousand baht and six million baht.

Any offender pursuant to paragraph one using a vessel of a size from one hundred and fifty gross tonnage onwards shall be subject to a fine of six million baht to thirty million baht.

Section 166. A supporter or beneficiary from the commission of an offence pursuant to this Royal Ordinance shall be subject to the same penalty as if he/she were the principal thereof.

Section 167. In a case where an offence constituting a serious infringement is re-committed within a period of five years, the penalty prescribed in each section therefor shall be doubled.

Section 168. In a case where an offender under this Royal Ordinance is a juristic person, if the commission of any such offence by any such juristic person has been based on the order or act of any person, or his/her omission to give an order, or failure to perform his/her duties, any such person shall also be subject to the penalty for any such offence.

Section 169. All the fishing gears, aquatic animals, or aquatic animal products, fishing vessels and any other thing used for or obtained through the commission of an offence pursuant to this Royal Ordinance shall be forfeited, with the exception of a non-Thai fishing vessel for which the owner or the possessor has deposited a security as prescribed by a court of law, in which case the court may order the release of any such vessel.

Section 170. The Fine Determination and Imposition Committee shall have the power to determine and impose fines in relation to all the offences pursuant to this Royal Ordinance.

The Fine Determination and Imposition Committee pursuant to paragraph one shall comprise a representative of the Office of the Attorney General as chairperson, a representative of the Royal Thai Police as a committee member, and a representative of the Department of Fisheries as a committee member and secretary. There shall be such a committee in both Bangkok and regional areas as prescribed by the Minister as appropriate.

The rules and procedures for the deliberation of the Fine Determination and Imposition Committee shall be as prescribed by the Minister, based on the severity of the offence, recidivism and deterrence.

When the accused has paid the fine imposed within thirty days as from the date on which the fine was imposed and has transferred all the aquatic animals or aquatic animal products seized to the public service, the criminal proceeding of any such offence shall be discontinued in accordance with the Criminal Procedure Code.

The provision under section 96 paragraph four shall also apply to the aquatic animals and aquatic animal products that the accused has transferred to the public service pursuant to paragraph four *mutatis mutandis*.

Transitory Provisions

Section 171. All Royal Decrees, Ministerial Regulations, Notifications, Directives or Orders issued pursuant to laws on fisheries in force on a date prior to the date on which this Royal Ordinance comes into force shall remain in force in as so far as they are not contrary to or inconsistent with this Royal Ordinance. This shall so remain up to a moment when a Ministerial Regulation, Notification, Directive or Order pursuant to this Royal Ordinance comes into force.

Section 172. All flora sanctuaries designated in the Notifications on a date prior to the date on which this Royal Ordinance comes into force shall be aquatic animal species sanctuaries areas pursuant to this Royal Ordinance.

Section 173. All concessions, fishing licenses, permissions or licenses already issued in accordance with the laws on fisheries prior to the date on which this Royal Ordinance comes into force shall still continue to remain valid up to the point they expire or are revoked.

Section 174. The Director-General may grant permission to any person engaged in artisanal fishing by the use of a vessel from ten gross tonnage to less than fifteen gross tonnage, provided

that such vessel has been registered as a fishing vessel and a fishing gear license was issued prior to the effective date of this Royal Ordinance, to continue with the artisanal fishing until such person's cessation of fishing operations.

Section 175. Any person undertaking aquaculture in a public domain of State on a date prior to the date on which this Royal Ordinance comes into force shall submit a request to seek a permit pursuant to this Royal Ordinance within one hundred and eighty days as from the date on which this Royal Ordinance comes into force. After having submitted a request to seek such a permit, he/she may proceed with his/her aquaculture undertaking up to a point they are notified of an order to discontinue.

Section 176. The Department of Fisheries shall make arrangements to complete the registration of local fishing community organisations within thirty days as from the date on which this Royal Ordinance comes into force.

Countersigned by

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Prime Minister

Taxation Rates Schedule

Permits authorizing the use of classified fishing tools

(1) Trawl nets	500 baht per metre
(2) Surrounding nets	20 baht per metre
(3) Lift nets or falling nets	30 baht per metre
(4) Gillnets or set gill nets	2 baht per metre
(5) Net fishing gears not specified	10 baht per metre
(6) Dredges	3,400 baht per unit
(7) Pound nets/set nets and barriers	4,000 baht per unit
(8) Traps	20 baht per unit
(9) Bug lift nets, <i>chon khan cho</i> dip nets, boat dip nets or raft dip nets fitted with a life part	600 baht per unit
(10) Fyke dip nets,fyke lift nets,or big lift nets/mullet lift nets	800 baht per unit
(11) <i>Chon</i> dip nets other than (9) and (10), 3.5 meters in width or over	200 baht per unit
(12) Baited set lines/Long-lines, 100 meters in length or over	80 baht per unit
(13) Cast nets/fishing nets, with a length of 3 meters or over	200 baht per unit
(14) Appliances/implements of other types	1,000 baht per unit

Fee rates

(1) A fishing license	10,000 baht per copy
(2) A permit authorizing an aquaculture undertaking in a fishing ground located on public domain of the State	5 baht per square metre
(3) A permit for the importation or exportation of aquatic animals or aquatic products	500 baht per copy
(4) Registration of a vessel as a vessel for the transshipment of aquatic animals or as a vessel for the storage of aquatic animals	10,000 baht per copy
(5) Work permit for work on board a fishing vessel	500 baht per copy
(6) Substitute license	100 baht per copy
(7) License assignment	100 baht per copy
(8) License renewal	Same as licensing fee per renewal



No. 0505.2/ 5989

Department of Fisheries
Kaset Klang, Chatuchak
Bangkok, Thailand 10900

29 June B.E. 2559 (2016)

Dear Mr. John Scanlon

Subject : Additional information on seahorses in Thailand

In response to the recommendations made by the 63rd and 65th Meetings of CITES Standing Committee (SC63 and SC65) for Thailand to conclude the implementation of recommendations (h), (i), (j) and (k), and inform the CITES Secretariat, the Department of Fisheries (DoF), Thailand has sent you the letter dated 25 December B.E. 2558 (2015) on "Additional information on seahorses in Thailand and temporary ceasing the issuance of export permit for seahorses (*Hippocampus* spp.)." With this letter, we would like to send you further information on seahorses in Thailand for consideration by the 67th Meeting of CITES Standing Committee that will take place in Johannesburg, South Africa as follow:

Recommendation (h):

The DoF, Thailand has implemented two methods of monitoring seahorses: firstly, through quarterly data collection using research trawlers along the Gulf of Thailand and the Andaman Coasts; and secondly, by quarterly monitoring of seahorse catch from major fishing gears at landing sites along the Gulf of Thailand and Andaman Coasts. Furthermore, monitoring and analysis of the stock status would also be undertaken annually.

1. The DoF, Thailand started seahorse monitoring program in 2016, by using the DOF research vessels to conduct survey along the coasts in the Gulf of Thailand (two trips) and the Andaman Sea (four trips). The results of the survey could be summarized as follows:

- 1.1) Four species of seahorses could be collected in the Andaman Sea:
 - *Hippocampus histrix* - one individual with the length of 13 cm. and wet weight of 10 grams was found at more than 40-meter depth;
 - *H. kelloggi* - sixteen (16) individuals with the length between 9-22 cm. and wet weight of 469 grams were found at the depth ranging from >10 to 20 meters;
 - *H. kuda* - three (3) individuals with the length between 12-16 cm. and wet weight of 25 grams were found in Phang-nga Bay at station 8, 11 and 12; and
 - *H. spinosissimus* - twenty-four (24) individuals with the length between 9-19 cm. and wet weight of 286 grams were found.
- 1.2) One (1) species of seahorse could be collected in the Gulf of Thailand:
 - *H. spinosissimus* - seventeen (17) individuals were found in the water depth ranging from 10-50 meters.

2. The DoF, Thailand plans to collect data on the status of seahorses, on quarterly basis, from three fishing gears (trawls, traps and gillnets) at three landing sites along the Gulf of Thailand and two landing sites along the Andaman Sea. The data include catch rate (total

number of seahorses caught during the total number of hours or days spent for fishing), species composition and seahorses length from the main fishing gears.

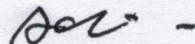
Recommendation (i):

Thailand is currently working with the Project Seahorse to develop population model of seahorses in response to exploitation pressure by using an age - structured model. Existing knowledge on life history parameter of *H. trimaculatus*, which is dominant seahorse species being traded in Thailand, has also been incorporated and considered in this study.

Furthermore, the DoF, Thailand also developed workplan for 10 Coastal Fisheries Research and Development Centers to set-up seahorses hatcheries/nurseries, and to produce approximately 100,000 individuals of seahorse annually. It is envisaged that this could help reducing the utilization of seahorses from natural sources and promoting seahorse aquaculture for trade purpose in the future.

In conclusion, the DOF Thailand is in the process of concluding our actions in response to recommendation (i); while actions in response to recommendations (h), (j), and (k) have already been completed to ensure that international trade will not become detrimental to the survival of *Hippocampus* spp. in the wild. These efforts of Thailand are compliance with Article IV, paragraphs 2(a), 3 or 6(a) of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Yours sincerely



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