

**Workshop Report**  
**Sea Cucumber Rearing and Conservation Workshop**  
**at Koh Phra Thong, Phang Nga, Thailand**  
**14-15 December 2013**

**Abstract**

A workshop was held at Koh Phra Thong between 14-15 December 2013 with the objective of training fishermen and villagers at Koh Phra Thong on sea cucumber rearing techniques, and to promote the conservation of sea cucumbers in protected areas. An expert from the Department of Fishery gave a half-day presentation sharing his technical expertise concerning habitat for different species of sea cucumber, pen building, feeding, and monitoring. After the presentation, villagers had a long discussion and decided to build a pen at Tha Pae Yoi village with an agreement for monthly monitoring by school students. The actual building was successfully completed later in January 2014. However, due to strong currents, the pen was damaged and all the sea cucumbers escaped. They plan to build a new pen at another more suitable site.

**Background**

Following a study tour on "Community Based Protected Areas" held in Phuket in August 2013, supported by a small grant from Mangroves For the Future (MFF), villagers from Koh Phra Thong and Ban Theparat were interested in cultivating sea cucumbers as an alternative income source. They agreed that undersized sea cucumbers should not be collected for sale but could be raised until they were fully grown.

A pilot project to try to cultivate sea cucumbers in front of Tha Pae Yoi village was widely discussed and supported. This workshop was organized to realize two objectives:

1. To train and give fishermen and villagers at Koh Phra Thong hands-on experience with sea cucumber rearing techniques, and
2. To promote sea cucumber conservation and discourage people from breaching the regulations of their protected areas.

Target groups included villagers from Ban Tha Pae Yoi and Ban Lions (Pak Jok) on Koh Phra Thong, and Ban Theparat on the mainland of Khuraburi District. Also present were representatives from Andaman Discoveries (AD) and Phuket Marine Biological Center (PMBC). Mr. Preecha Pachuenjai, from Fisheries Technology Transfer and Development Bureau (FTTDB) under the Department of Fisheries, was invited as an expert and a trainer for this workshop.

**Workshop Timetable**

13 December 2013

PM                      Trainer and organizers arriving Koh Phra Thong  
                                 Site survey

14 December 2013

AM                      Workshop opening  
                                 Sea cucumber rearing techniques presentation  
                                 Q & A

PM                      Planning pen building  
                                 Assembling building materials and equipment

15 December 2013

AM-PM                Building and finishing the pen at selected site  
                                 (moved to later date due to unsuitable tide)

## Presentation on sea cucumber rearing techniques (Mr. Preecha Pachuenjai, DoF)

On 14 December, Mr. Preecha introduced himself. He is an academic staff member of the Fisheries Technology Transfer and Development Bureau (FTTDB). He presented his experience rearing sea cucumbers at Koh Sarai in Satun where a pen was constructed with local materials (i.e. old fishing nets and bamboo posts).



Content of the presentation included:

- Habitat for sea cucumbers
  - *H. scabra* → sand + mud
  - *H. atra* → sand + mud
  - *Stichopus sp.* → coral reef

A suitable area for building a sea cucumber pen should retain water to a depth of at least 50cm during lowest tide, otherwise a shade has to be built to protect sea cucumbers from the sun and drying out.

- Water quality
  - Temperature 24-28°C
  - Salinity 27-35 ppt

Sea cucumbers can live in the water with salinity less than 10 ppt for up to 17 hours.

- Feed
    - Cultivation in cement pond → shrimp feed
    - Cultivation in the sea → scrap fish approx. 1-3 times/month
- They need an amount of food equal to 3% of their body weight.

- Growth stages

Sea cucumbers usually take about a year to reach maturity, with their reproductive systems fully developed. Breeders should be at least 1.5 years of age. It takes 45 days to develop from eggs to baby sea cucumbers. To stimulate reproduction, the cultivator may add chlorella (chopped seaweed) into the pond or decrease salinity of the water by adding fresh water. During the first two months of age, food must be enough for them to grow well.

- Past experiences

Villagers from Ban Lions tried to naturally cultivate 3,000 sea cucumbers in pens in the sea. They grew to a certain size then stop growing. Their bodies were hard. The expert explained that was probably because they were living in the sand and lacked protein.

## Discussion: site selection process



Villagers had to choose a suitable site (Ban Tha Pae Yoi versus Ban Lions) to build one pilot pen for sea cucumbers. Criteria were set and proposed sites were voted on.

### Criteria for site selection

1. Sandy and muddy bottom
2. Some seagrass
3. Standing water of at least 50cm at lowest tide
4. Not far from the village
5. Feasible for data collection

### Proposed sites

- Ban Tha Pae Yoi: In front of Ta Hai's house, next to the school (inside protected area)
- Ban Lions: 1) Klong Hom, and 2) Pak Jok inlet



The majority voted for the site at Ban Tha Pae Yoi (picture above) because it meets the criteria, is easily accessible, and can be observed from the village.

### Further agreement

- Pen size: 4x4m
- Number of sea cucumber: 30
- Responsible person: Go Jeab and Ban Tha Pae Yoi school students
- Timeframe: 8 months
- Feeding period: 2 times/month (neap tide)
- Size measuring: 1 time/month

### **Materials acquirement**



The DoF expert mentioned that old fishing net and bamboo posts can be used as material. However, when asking around for those materials, none of the villagers had it. The village doctor who owned a net for other purpose offered his net, but found out later that it was too old and falling apart. Therefore, the materials (fine-mesh fishing net and mangrove posts) have to be bought and Go Dang took responsibility for acquiring them.

### **Building a sea cucumber pen at Ban Tha Pae Yoi**

On 15 December, the workshop participants gathered on the shore south of the main village pier to discuss the building of a cage for sea cucumbers nearby. The site was chosen because it had an area of water deep enough to never drain during the lowest tides. It was also easily accessible from shore, and within sight of houses. A decision was made to build a pen on 20 December, but the tide was not low enough on that date, and the building was delayed until the next low tide period.



Seven



local men gathered in the afternoon of 3 January to assemble a pen. Straight poles, 3-4 meters in length, had been pre-cut. The poles were driven down into the sandy substrate to create a frame around an area approximately 4 meters square. Sections of net with 1" mesh had been cut and sown together with rope to create a large envelop to fit over the frame. It had been decided that the pen would have a cover of netting because an open pen would need to be extremely high because the area has spring

tides greater than 3 meters. The pen was completed in about 2 ½ hours, and the structure stands about 2 meters high. The lower edge of the netting was pegged down into the substrate using wooden stakes. A few sea cucumbers were introduced into the cage.



Problems have developed with the pen. Strong currents at the site have scoured the sand away from the bottom on both sides and the netting has lifted. The stakes cannot hold the net in place and any sea cucumbers placed in the cage can escape. It has been proposed that a net bottom be built under the pen, or that it be moved to a more sheltered site. There is reluctance to move it because sheltered areas would be out of sight of houses, and there is fear of theft.

It has been proposed that only small experimental pens, 4 x 4 meters, be built at this time to develop the technique for raising sea cucumbers. Animals placed in the pens will need to be monitored on a regular basis to determine if they are growing and developing normally. For that purpose, a data sheet has been developed (Appendix 3) for recording the length, width, and weight of up to 30 individuals. The data should be recorded once a month, along with information on any food put in the pens and other observations.

### **Conclusion**

The workshop was intended as a starting point for villagers to conserve sea cucumber populations. They can now consider rearing sea cucumbers in pens and marketing them when they are fully grown, rather than harvesting and selling undersized animals. Although the pilot project cannot be considered a success at this time, Koh Phra Thong villagers have learned to work together as a team and deal with unexpected obstacles. There is a high potential that they will be able to manage to cultivate this marine animal in the future by learning over time from a trial and error process. External support in terms of financial and technical assistance will definitely contribute to the continuation of this learning process by people on Koh Phra Thong, which will have a long-term benefit for conservation.

### **Funding for Workshop**

This workshop was made possible through funding from the Rufford Small Grant Foundation to Barry Bendell for the project "Evaluation and Monitoring of Marine Protected Areas in Seagrass Meadows at Phra Thong Island, Thailand".



## Appendix 1

Participant List: Ban Tha Pae Yoi



ใบลงทะเบียน

Registration for Workshop

โครงการอบรมเชิงปฏิบัติการเทคนิคการเลี้ยงปลิงทะเลเพื่อการอนุรักษ์

บ้านท่าแปะไย้อย ต.เกาะพระทอง อ.คุระบุรี จ.พังงา

Tha Pae Yoi, Koh Phra Thong

วันเสาร์ - อาทิตย์ที่ ๑๔ - ๑๕ ธันวาคม ๒๕๕๖

14-15 December 2013

บ้านท่าแปะไย้อย Tha Pae Yoi			
ลำดับ	ชื่อ-นามสกุล - Name	เบอร์โทรศัพท์ - Tel.	ลายมือชื่อ - Signature
1	นาง กิ่งตั้น รอดกร	๐๘๗ ๒๖๕๗๖๘๐	✓ [Signature]
2	นาย ธรรมพร เกิดศิริ	๐๘๓-๑๘๑๖๔๙๘	[Signature]
3	นาย วิชา เกิดศิริ	๐๘๓-๑๘๑๖๔๙๘	[Signature]
4	นาย ภาณุเดช เกื้อเจริญ	๐๘๓-๔๔๑๔๗๘๖	[Signature]
5	นาง จิตต์พร จิตต์ศิริ	๐๘๖-๒๘๘๙๖๔๖	[Signature]
6	นาย วิชาญ วัฒนศิริ	๐๘๒๖๑๖๓๔๐	[Signature]
7	นาย วิชัย นวกุล	๐๙๓๗๗๔ ๙๐๗๐	[Signature]
8	นาย วัฒนวิทย์ นวกุล	๐๘๗-๘๙๔๓๔๒๗	[Signature]
9	นาง นุชจิรา รอดกร	๐๘๑๐๗๗๕๕๐๔	[Signature]
10	นาง นวรัตน์ รอดกร	๐๘๔๖๒๖๙๒๒๒	[Signature]
11	นาย ทนต	๐๘๓-๕๙๖๐๕๙๘	[Signature]
12	นางสาว กิ่งแก้ว (บุตร.เกษรติประเท)	๐๘๙-๙๗๒๖๗๐๖	[Signature]
13	นาย สวัสดิ์ กำแพง		[Signature]

14 นาย สมพร งามระ  
15 นาง นพพร นพพร

๐๙๐-๑๕๙๙๙๕๕

[Signature]

## Appendix 1

Participant List: Ban Lions (Pak Jok)

1



ใบลงทะเบียน

โครงการอบรมเชิงปฏิบัติการเทคนิคการเลี้ยงปลิงทะเลเพื่อการอนุรักษ์

บ้านท่าแป๊ะไย้อย ต.เกาะพระทอง อ.คุระบุรี จ.พังงา

วันเสาร์ - อาทิตย์ที่ ๑๔ - ๑๕ ธันวาคม ๒๕๕๖

บ้านไลออนส์ (ปากจอก) Ban Lions (Pak Jok)			
ลำดับ	ชื่อ-นามสกุล - Name	เบอร์โทรศัพท์ - Tel	ลายมือชื่อ - Signature
1	ประคอง เหมะพนนาท	0898787210	ประคอง เหมะพนนาท
2	นาง นงนุช พันธุ์กุล	0806488695	นาง นงนุช
3	นางสาว นว.สิทธิ์ สารสมุทร	084-8980842	น.ส. นว.สิทธิ์
4	นาง นว. นงนุช	087 2813005	นาง นว. นงนุช
5	พี่ระ ทอรวน	0862726057	พี่ระ
6	นางสาว นว. นงนุช	087 267 7354	นางสาว นว. นงนุช
7	นางสาว นว. นงนุช		นางสาว นว. นงนุช
8	นางสาว นว. นงนุช	0808791328	นางสาว นว. นงนุช

## Appendix 1

Participant List: Other participants, Invited Expert and Organizers

3



ใบลงทะเบียน

โครงการอบรมเชิงปฏิบัติการเทคนิคการเลี้ยงปลิงทะเลเพื่อการอนุรักษ์

บ้านท่าแป๊ะไย้อย ต.เกาะพระทอง อ.คุระบุรี จ.พังงา

วันเสาร์ - อาทิตย์ที่ ๑๔ - ๑๕ ธันวาคม ๒๕๕๖

ผู้เข้าร่วมอบรม - other participants				
ลำดับ	ชื่อ-นามสกุล - Name	หน่วยงาน/หมู่บ้าน Organization/Village	เบอร์โทรศัพท์ Tel.	ลายมือชื่อ - Signature
	น.ส.สาธิตา เผ่ากันทะ (กุ่ม)	ศูนย์วิจัยและพัฒนาทรัพยากรทางทะเลและชายฝั่งทะเลอันดามัน (กลุ่มนิเวศทางทะเล)	089-6578081	สาธิตา (กุ่ม)
	อัมมิลลาห์ ไรซาค	Andaman Discoveries	089 2119223	Amillah
	Umillah Razak	Andaman Discoveries		Am
	สมทวิ ภาณุพงศ์	บ้านเทพรัตน์	0819687127	สมทวิ
ทีมผู้จัดงาน / วิทยากร Invited expert + Organizers				
	นายปรีชา พาชื่นใจ	วิทยากร / กรมประมง	081-3046257	ปรีชา
	Barry Bendell	The Rufford Foundation	083-3886641	Barry
	น.ส.เพชรรุ่ง สุขพงษ์	ผู้ดำเนินรายการ	081-3735447	เพชรรุ่ง
	น.ส.วรรณสิริ รงรองเมือง	ผู้ประสานงานโครงการอบรม	081-3416110	วรรณสิริ

## Appendix 2

### Workshop Expenses

Expenses for the Workshop on the Rearing and Conservation of Sea Cucumbers At Ban Tha Pae Yoi (TPY), Koh Phra Thong, Phang-Nga 14-15 December 2013		
Description of expense	Thai Baht	£ Sterling*
Coordination of workshop (1,000B/day)		
Preparation – 3 days	3,000	62.03
Days of meeting and travel to TPY – 3 days	3,000	62.03
Report writing and follow up – 2 days	2,000	41.36
Honourarium for Khun Preecha	4,000	82.71
Mobile phone charges	300	6.20
Stationery and photocopying	106	2.19
Food and Accommodation at TPY		
Homestay with meals for 2 persons - organizers	1,520	31.43
Homestay with meals for 4 outside participants	3,440	71.13
Lunch for participants for one day and coffee break	4,500	93.05
Travel to TPY		
Bus tickets for Khun Preecha, 2 ways between Bangkok and Khuraburi	1,106	22.87
Petrol for car coming from Phuket	500	10.34
Boat from Khuraburi pier to Ban Lions	900	18.61
Rental motorcycle with sidecar and petrol, Ban Lions to TPY	310	6.41
Petrol for boat between Thapararat and TPY	500	10.34
Materials for construction of pens		
Rope and PVC pipe for pen at Thapararat	1,056	21.84
Net, rope, wood, nails for pen at TPY	3,760	77.75
<b>Total expenses</b>	<b>29,998</b>	<b>620</b>

\*1£ = 48.36B, the rate used in original proposal



## Appendix 3

### Data Sheet

#### การเติบโตของปลิง

สถานที่	
วันที่	เวลา
ผู้วัด	

การวัด	ความยาว (ซม.)	ความกว้าง (ซม.)	น้ำหนัก (กรัม)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

การวัด	ความยาว (ซม.)	ความกว้าง (ซม.)	น้ำหนัก (กรัม)
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

นำปลิงขึ้นจากน้ำ 15 นาที จึงวัดขนาดความยาว ความกว้าง และน้ำหนัก

อาหารของปลิง		
วันที่ให้	ประเภทอาหาร	จำนวน

การสังเกต
-----------