การสำรวจพะยูนฝั่งทะเลอันดามัน ปีพ.ศ. 2551

Dugong Survey in the Andaman Sea, Thailand in 2008

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บทคัดย่อ

สถาบันวิจัยและพัฒนาทรัพยากรทางทะเล ชายฝั่งทะเล และป่าชายเลน กรมทรัพยากรทางทะและชายฝั่ง ร่วมกับมูลนิธิช่วยชีวิตสัตว์ป่าแห่งประเทศไทย ได้ดำเนินการสำรวจและติดตามประชากรพะยูนทางอากาศ (aerial survey) ด้วยเครื่องบินขนาดเล็ก (Tecnam P92JS, 2 seater light aircraft) บริเวณชายฝั่งทะเลอันดามัน ในจังหวัดพังงา ภูเก็ต กระบี่ และตรัง บินเป็นเส้นตั้งฉากกับชายฝั่ง (Transect line) การสำรวจมุ่งเน้นในพื้นที่จังหวัดตรัง ส่วนพื้นที่อื่นสำรวจเพียงครั้งเดียวเท่านั้น ทำการสำรวจทั้งหมด 9 เที่ยวบิน ใน 7 วัน ระหว่างวันที่ 13-23 มกราคม 2551 ทำการบินประมาณวันละ 2:30-3:30 ชั่วโมง บินด้วยความเร็ว 70-80 น็อต (ประมาณ 130-150 ก.ม. ต่อช.ม.) ที่ระดับความสูง 500-800 ฟุต อุปกรณ์พื้นฐานที่ใช้ในการสำรวจคือ กล้องถ่ายรูปดิจิตอล (Nikon D80) พร้อมเลนส์ 80-400 มม. เครื่องบันทึกตำแหน่งพิกัด (GPS, Global Positioning System) และเครื่องบันทึกเสียงเพื่อใช้บันทึกชนิด จำนวน พฤติกรรม และอื่นๆ

สำรวจพบพะยูนเฉพาะพื้นที่บริเวณเกาะมุกด์-เกาะตะลิบง จังหวัดตรังเท่านั้น จำนวนพะยูนที่สำรวจพบในแต่ละการสำรวจ อยู่ระหว่าง 6-96 ตัว หรือเฉลี่ย 39.4±32.3 ตัว หรือคิดเป็นการพบเห็นพะยูน 18.4 ± 12.2 ตัวต่อชั่วโมง แหล่งหญ้าทะเลบริเวณนี้เป็นแหล่งเลี้ยงดูลูกของพะยูนเพราะพบพะยูนคู่แม่ลูกสูงสุดถึง 17 คู่ต่อการสังเกต 1 ครั้ง พบพฤติกรรมการผสมพันธุ์จำนวน 4 ครั้ง นอกจากนี้ยังสำรวจพบโลมาหลังโหนกและเต่าทะเลอีกด้วย นับว่าแหล่งหญ้าทะเลที่อุดมสมบูรณ์บริเวณเกาะมุกด์และเกาะตะลิบงจังหวัดตรังยังคงอุดมสมบูรณ์ และเป็นแหล่งอาหาร แหล่งผสมพันธุ์ และเลี้ยงดูลูกที่สำคัญของพะยูนฝูงใหญ่ที่สุดในประเทศไทย

Abstract

Phuket Marine Biological Center (PMBC), Department of Marine and Coastal Resources (DMCR) in cooperation with The Wild Animal Rescue Foundation Thailand (WARF) have conducted the aerial survey for dugong population along the Andaman Sea Coast, Thailand using the aircraft (tecnam P92JS, 2 seater light aircraft). The study areas are in Phang-nga, Phuket, Krabi and Trang provinces. Surveys were operated intensively at Muk and Talibong Islands, Trang province while the other areas were done only one flight. Surveys were conducted 9 flights in 7 days observation during 13th-23rd January 2008. The flight was operated about 2:30-3:30 hours in each day. The survey speed was about 70-80 Knots (about 130-150 km per hour) at the altitude of 500-800 feet. Basic equipments were a digital camera (Nikon D80) with 80-400 mm lens, GPS (Global Positioning System) and a voice recorder. Recordings were made of the species of the animals, number, behavior and others.

Dugongs found only in the area of Muk-Talibong Islands, Trang province which ranged from 6-96 individuals per survey or average 39.4±32.3 individuals per survey. Sighting of dugong around Muk-Talibong Islands was 18.4 ± 12.2 individuals per hour. It seemed that the area was the nursery ground of dugong since many cow-calf pairs were observed up to 17 pairs per survey. Mating behaviors were also noticed 4 times. In addition, Indo-Pacific hump-backed dolphin and sea turtle were also observed. This survey indicates that seagrass beds at Muk-Talibong Islands are the most important feeding ground for the largest dugong population in Thailand including the mating area and nursery ground of dugongs.

Introduction

Dugong (*Dugong dugon*) and manatees (*Trichechus* spp.) are the only known herbivorous marine mammals (Heinsohn and Birch 1972; Nishiwaki and Marsh 1985; Preen 1995; Marsh et al., 2002). They demonstrate distinctive distribution patterns as well as remarkable breeding and social behaviors (Anderson and Birtles 1978; Preen 1989; Marsh and Rathbun 1990; Marsh 1995; Chilvers et al. 2004). Dugongs have been believed to commonly distribute along both coastlines of the Andaman Sea and the Gulf of Thailand, until recently, they become rare and only restricted in some areas (Adulyanukosol, 2000; Adulyanukosol et al., 1997; Hine et al., 2005a,b).

Currently the largest group of dugongs has been reported in Trang waters particularly in the area of Muk-Talibong Islands (Adulyanukosol, 2000, 2004; Adulyanukosol et al., 1997; Hines et al, 2005a). The population of dugong was estimated about 123 animals in Trang in 2001 (Hine et al., 2005a). Moo Kho Libong Non-Hunting Zone belonging to National Park, Wildlife and Plant Department (DNP) was designated off the coast of Talibong Island in 1979. Within the Non-Hunting Zone, hunting, collecting, and other activities that would modify the environment are prohibited. Hence dugongs, birds and other wildlife are protected inside the area. In addition in 1992 four main seagrass beds of Trang were declared as 'Dugong and Seagrass Conservation Areas' in which all fishery activities (e.g., all types of push net and trawler, beach seine, drive-in net and dynamite fishing) are banned. Since then, the dugong has become a 'flagship species' in Trang and the conservation of dugong and seagrass beds in Trang is the most outstanding dugong conservation effort in Thailand (Adulyanukosol, 2004; Hines et al., 2005b).

There are many kinds of aircrafts that can be used to survey the dugong. In Thailand we have been used helicopter (Bell, S-76B), a small fixed wing aircraft (Dornier-227), ultralight and microlight. The recommended speed is about 130-170 km per hour and the good visibility does not exceed than 300 m (Heinsohn, 1981).

In 2004 Department of Marine and Coastal Resources (DMCR) and Wildlife Conservation Society (WCS-Thailand Program) had held two workshops, a specialist round table and a public hearing workshops in order to initiate the Dugong Action Plan for Thailand (Adulyanukosol, 2004). Soon after DMCR had developed that action plan and combined it with the Seagrass Action Plan of the Gulf of Thailand to be the Seagrass and Dugong Action Plan in the 2007. For the international cooperation of Dugong Conservation, DMCR incorporated with the Australian government had held 2 workshops on dugong conservation in order to develop the Memorandum of Understanding for Dugong (MoU) in 2005 and 2006. In October 2007, seven countries have already signed Dugong MoU at Abu Dhabi, United Arab Emirates. Thailand is planning to sign this MoU at the next meeting.

Knowing the dugong population and their behavior is very important for conserving the dugongs and their habitats. This report showed the result from the aerial surveys of dugong population in Phuket, Phang-nga, Krabi and Trang provinces during 13^{th}-23^{rd} January 2008. This information is useful for developing species conservation plans.

Materials and Methods

Aerial surveys for dugong population were conducted 9 flights in 7 days during 13^{th}-23^{rd} January 2008. The surveys were made at the coast of Paklok beach in Phuket province, Yao Noi and Yao Yai Islands in Phang-nga province, Sriboya, Cham and Pu Islands in Krabi province and Sikao bay and Muk-Talibong Islands in Trang province (Fig 1-3). A two seater light aircraft (HS-EAL, Tecnam P92JS) was used in this survey (Fig 4). The transect lines were conducted under the speed of about 70-80 knots (about 130-150 km per hour) at the

altitude about 500-800 feet (Fig 1-3). The airfields were in Phuket, Krabi and Trang provinces.

The flight was operated about 2:30-3:30 hours in each day; each flight's duration was about 1:30-3:30 hours. Captain sat in the left and the observer sat in the right side of the aircraft. Digital camera (Nikon D80) with 80-400 mm lens, a voice recorder and GPS (Global Positioning System) were basic equipment used for the aerial survey. Waypoint (latitude and longitude) was marked on the GPS when the animals were seen. The species, number, size and behavior of the animals were recorded in the voice recorder. We took the photographs when the animal was clearly seen.

Results and **Discussion**

The dugong sighting data including dolphin and sea turtle sighting was shown in Table 1 and Fig 5-13. Most observations were conducted at Muk-Talibong Islands, Trang province. The observations in Phuket, Phang-nga and Krabi provinces were less than one hour. The flight or transect line survey around Sriboya, Cham and Pu Islands in Krabi province was not complete because the weather was not good and it was not safe to survey (Fig 3).

The sighting of dugong in Muk-Talibong area was 6-96 individuals per day or average of 39.4±32.3 individuals per survey. Sighting of dugong at Muk-Talibong Island was 18.4 ± 12.2 individuals per hour. The number of sighting of dugong around Muk-Talibong Islands in February 2005 and November 2006 were little higher than that of this survey (Table 2).

There are many factors influencing the result of aerial survey *i.e.* the type of aircraft including speed and altitude of the flight, duration of the survey (morning or afternoon) and how long of each survey. The weather, visibility in the air and sea water, and tide condition including an experienced pilot and observer are the main factors for the survey as well. We don't know whether sometime the dugongs in Trang waters have migrated to feed in other areas. However the number of dugong found in spring tide's survey was much more than the number of dugong found in neap tide's survey (unpublished data). It will make the calculation of dugong population easier, if we can conduct the survey by using the same survey method and same type of aircraft.

Mating behaviors of dugongs observed 4 times between 11:00 am and 14:30 pm on 14, 15 and 22 January 2008 were 1, 2 and 1 pair(s), respectively (Fig 6). Mating behavior was seen only at 2 areas; area between Talibong Island and mainland Trang, and Thung Jeen Bay (Fig 1). This observation corresponded with the previous study in 2003 and 2005 (Adulyanukosol et al., 2007).

The Indo-Pacific hump-backed dolphin, *Sousa chinensis* was seen 0-3 individuals or average of 0.5±0.9 individuals per survey (Fig 9). In 2005 and 2006 Indo-Pacific hump-backed dolphin were seen 0-13 individuals and 0-10 individuals per survey, respectively (Adulyanukosol and Thongsukdee, 2005, 2006). This group of dolphins forages in the area between Talibong Island and Sukorn Island (southern Trang).

Most of the sea turtles found were Green turtle, *Chelonia mydas* and some of them probably were Hawksbill turtle, *Eretmochelys imbricata* (Fig 9). Turtles were seen between 2-26 individuals per survey or average of 11±9.0 individuals per survey. Maximum counts of turtle per survey in 2005 and 2006 were 21 and 26 individuals, respectively (Adulyanukosol and Thongsukdee, 2005, 2006). The outside features of Green and Hawksbill turtles seen from aerial observation are very similar, since these two species have similar size and color pattern of the carapace. In general, the shape of carapace of Green turtle is rather round while that of the Hawksbill is ellipse (Adulyanukosol et al., 1997). All turtles seen from aerial survey in Australia were assumed to be Green turtle (Marsh and Sinclaire, 1989).

Table 1. The sighting data obtained from aerial survey during 13th-23rd January 2008 in Phuket, Phang-nga, Krabi and Trang provinces.

Date ***(flight time)***	**Location**	**Dugong (ind.)**		**Dolphin (ind.)**	**Sea Turtle (ind.)***	**Remark**
		Adult, calf	**Total**			
13 Jan 09:26-10:58am	Muk-Talibong Islands, Trang	26,3	29	-	2	
12:22-15:07pm		33,2	35	-	7	
14 Jan (12:11-15:24 pm)	Muk-Talibong Island, Trang	21,2	23	2**	7	
15 Jan 08:31-11:06 am	Muk-Talibong Islands, Trang	6,0	6	3**	3	Mating behavior of dugong
12:35-15:19 pm		17,1	18	-	7	Mating behavior of dugong
19 Jan 08, 07:54-08:46 am	Paklong beach, Phuket	-	-	-	-	Many jelly fishes
08:46-09:30am	Yao Noi -Yao Yai Isands Phang-nga	-	-	-	2	
09:30-10:29 am	Sriboya, Cham and Pu Islands, Krabi	-	-	-	-	Very windy and not good for survey
20 Jan 08 08:16-11:30 am	Muk-Talibong Islands, Trang	78,5	83	-	23	
22 Jan 08, 09:00 am-12:28 pm	Muk-Talibong Islands, Trang	79,17	96	-	26	Mating behavior of dugong
23 Jan 08, 08:46-09:18 am	Sikao bay, Trang	-	-	-	-	
09:18-11:36 am	Muk-Talibong Islands, Trang	21,4	25	-	13	Very turbid water
average only around Muk-Talibong Is. (ind per survey)		-	**39.4±32.3**	**0.5±0.9**	**11±9.0**	

*****Most of sea turtle sighting was Green turtle and only some of them might be a Hawksbill turtle. ******Indo-Pacific hump-backed dolphin

Table 2. The information of dugong survey around Muk-Talibong Islands in 2005, 2006 and 2008. The operation hours of each survey in each year were not same.

Date	Dugong Min, Max (ind.)	Dolphin Min, Max (ind.)	Sea Turtle Min, Max (ind.)	Remarks
Feb 2005*	42, 126 *(89.6 ± 34.8 ind. per flight)*	0, 13	8, 21	-High tide before noon -5 days observation
Nov 2006*	38, 128 *(83.9 ± 33.7 ind. per flight)*	0, 10	9, 26	-High tide before noon -9 days observation
Jan 2008**	6, 96 *(39.4 ± 32.3 ind. per flight)*	0, 2	2, 26	-Most high tide in the afternoon -6 days observation
*Surveys were conducted by a microlight. ** Surveys were conducted by a light aircraft (Tecnam)				

Acknowledgements

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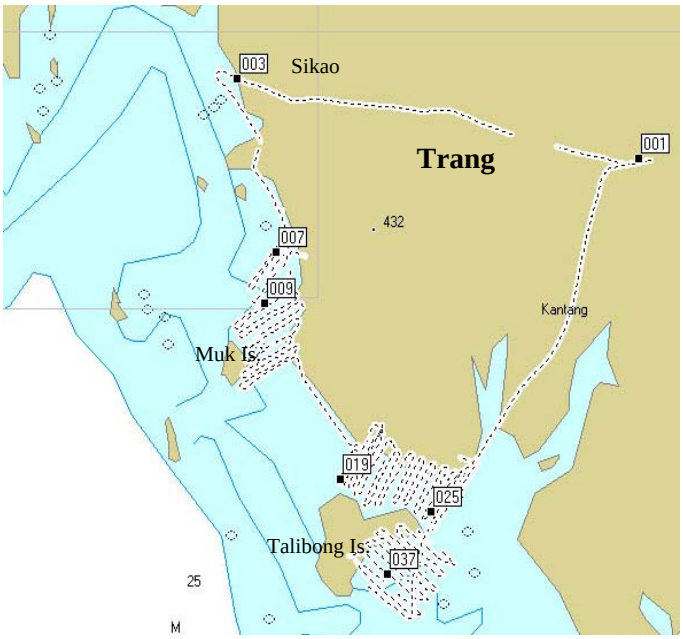

Figure 1. Transect line survey at Sikao bay, Muk Island and Talibong Island, Trang province. 001- Trang airport; 003-Sikao Bay; 007-seagrass bed in front of Had Chao Mai National Park; 009-area between Muk Island and mainland; 019-area between Chao Mai river mount and Talibong Island; 025- the coast of Laem Chu Hoi and 037-Thung Jeen Bay, Talibong Island

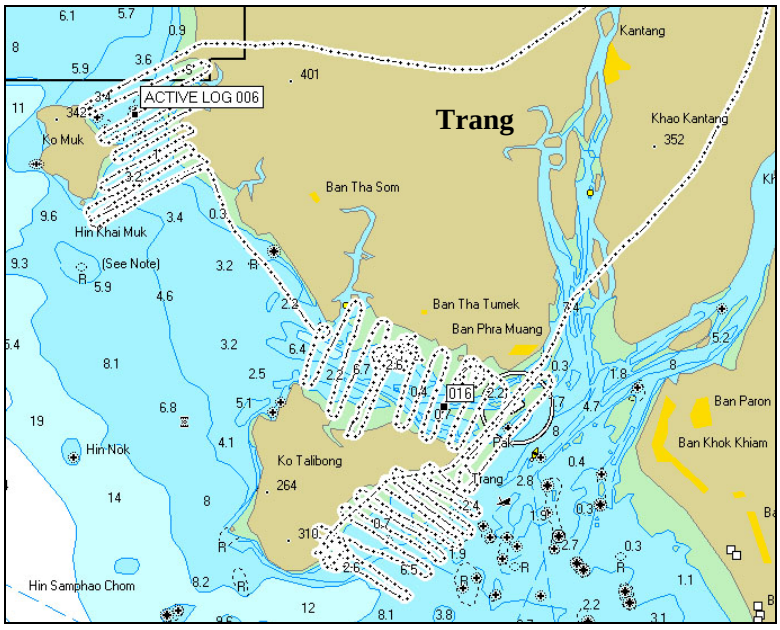

Figure 2. Transect line survey at Muk-Talibong Islands. The way point of GPS (latitude and longitude) was marked when dugong or other animal was observed. Circle flight was made at way point 016 while taking photographs.

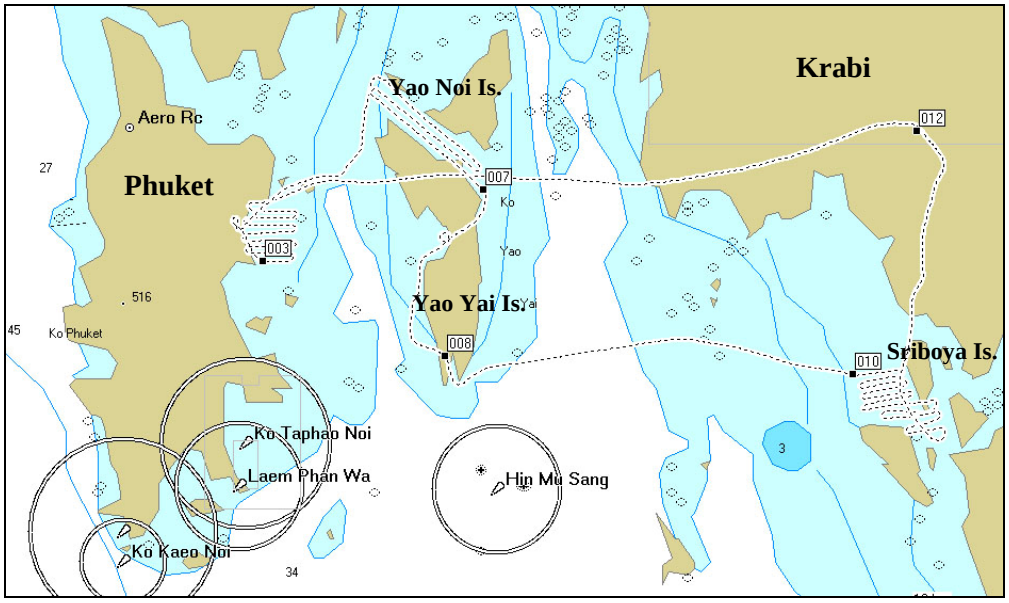

Figure 3. Transect line survey at Phuket, Phang-nga and Krabi. 003-Paklok beach, Phuket province; 007-the channel between Yao Noi and Yao Yai Islands, Phang-nga province; 008-Lopalai Bay, Yao Yai Island; 010-the coast off Sriboya Island, Krabi province and 012-Krabi International Airport.

Figure 4. The two seater light aircraft (Tecnam P92JS) which was used in the survey, with Captain Eduardo Angelo Loigorri (left) and Ms. Kanjana Adulyanukosol (right).

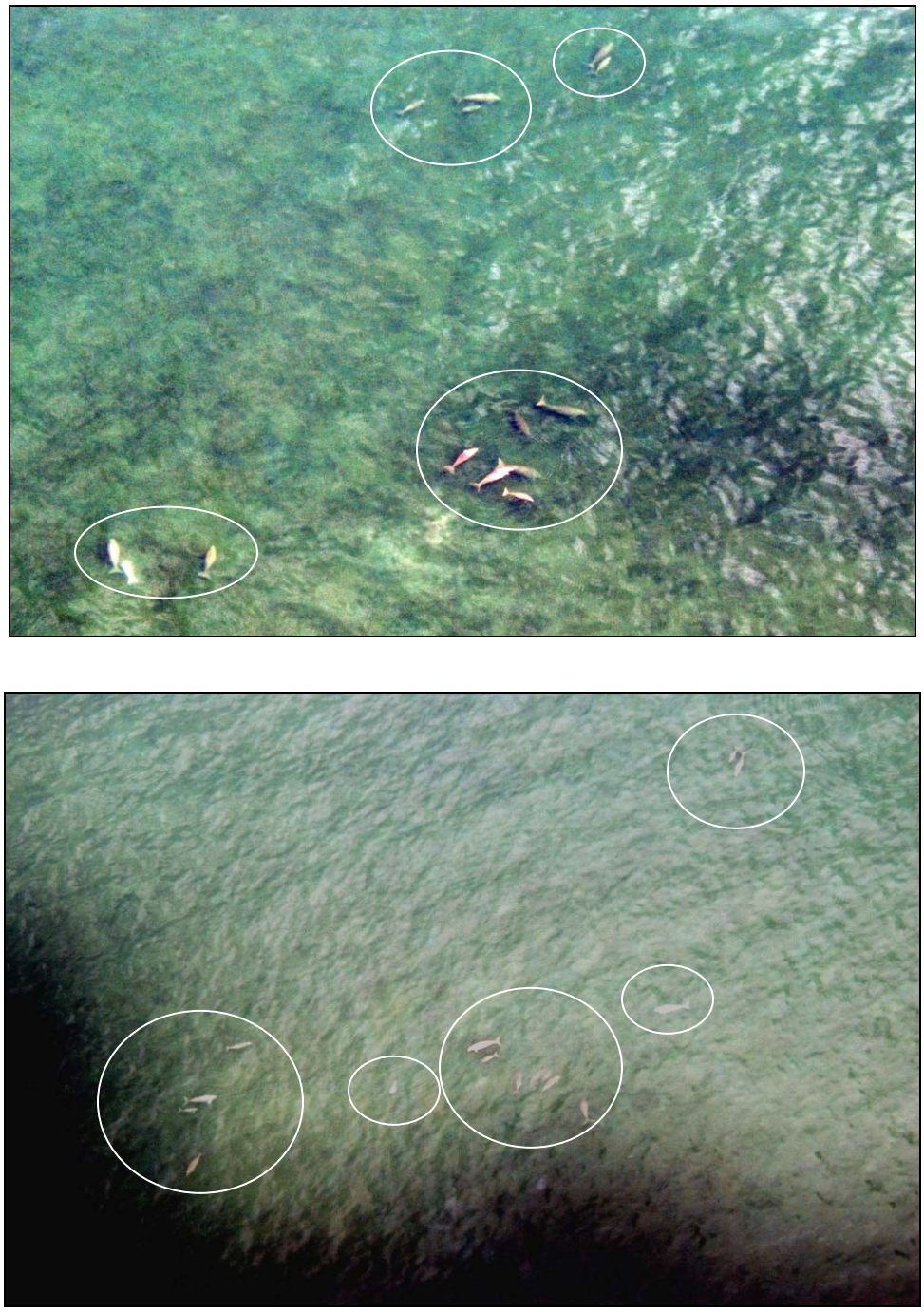

Figure 5. Photographs taken on 22 January 2008 at Laem Chu Hoi, Talibong Island. (Above) 14 dugongs including 4 pairs of cow-calf; (Below) 15 dugongs including 4 pairs of cow-calf.

Figure 6. Mating behavior was observed on 15 January 2008 at Talibong Island.

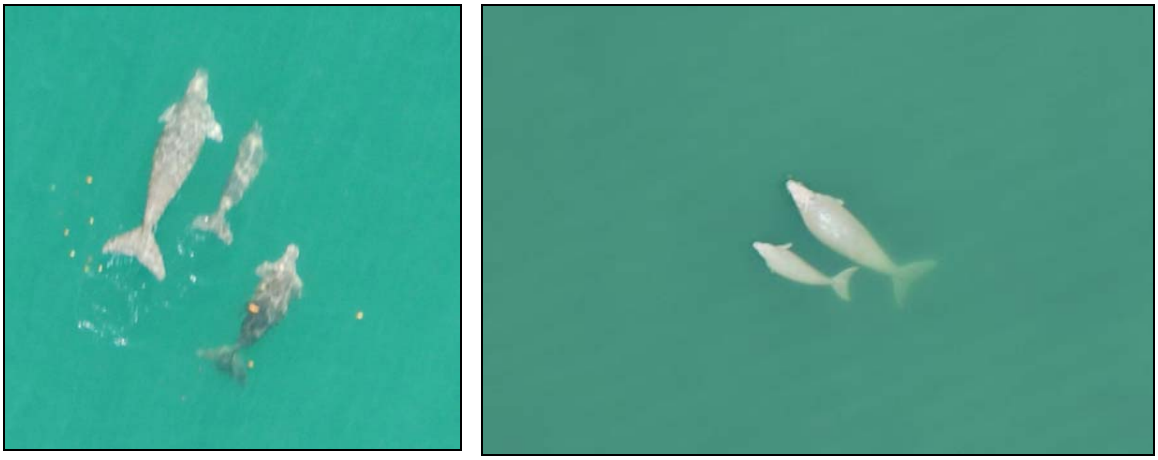

Figure 7. (Left) A pair of cow-calf and on the right side a presumably a weaned calf or immature dugong were seen between Chao Mai river mount and Talibong Island on 13 January 2008; (Right) A calf always stayed beside its mother.

Figure 8. (Left) It was not easy to notice this dugong under the glare condition; (Right) This dugong was spotted when the water was clear.

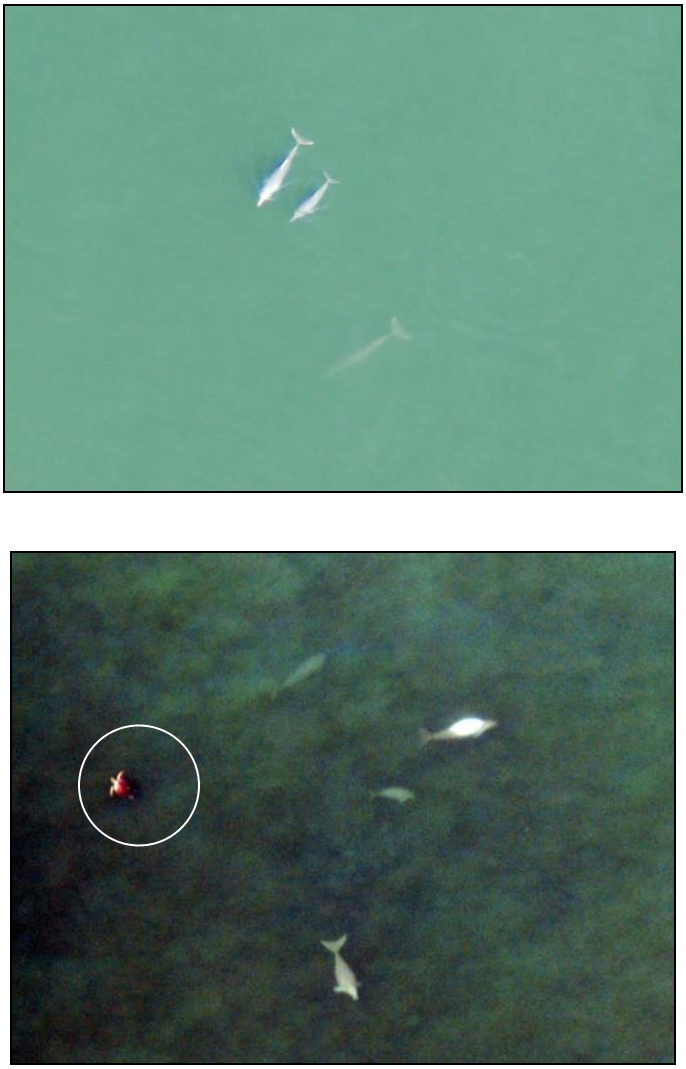

Figure 9. (Above) Three Indo-Pacific hump-backed dolphins, *Sousa chinensis* were observed on 15 January 2008; (Below) A Green turtle, *Chelonia mydas* was also feeding in the seagrass bed.

Figure 10. It seemed that this calf tried to suck the milk from the auxiliary nipple of the mother.

Figure 11. While traveling some dugong showed rolling behavior.

Figure 12. (Left) A group of 6 dugongs found traveling into seagrass bed when the tide was getting higher; (Right) A solitary dugong was often seen traveling or feeding.

Figure 13. Some old dugong has a large white patch on the back (arrow).

Figure 14. Photograph showed many feeding trails (light color lines) on the seagrass bed at Laem Chu Hoi, Talibong Island that occurred after dugong grazing.

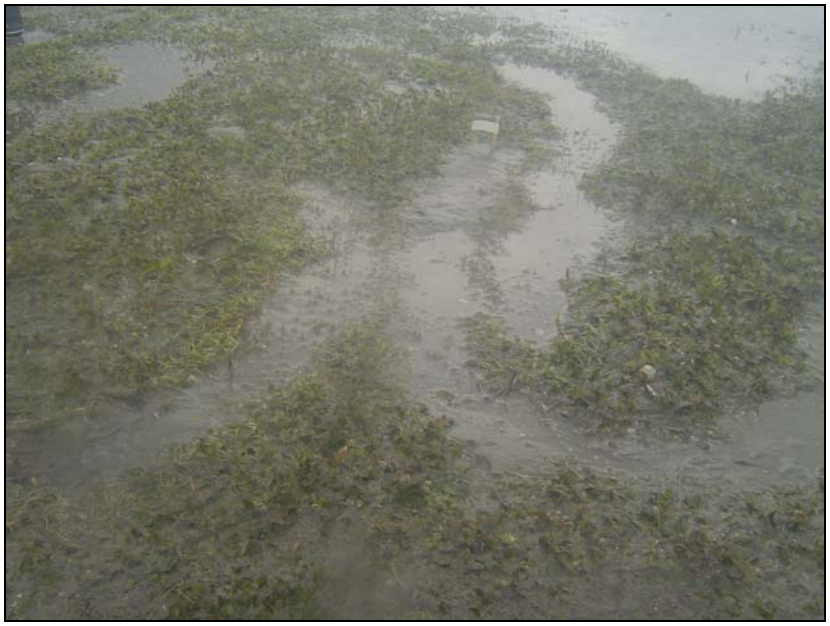

Figure 15. The feeding trails were generally about 10-20 cm in width and 2-5 m in length. Most trails were observed on Spoon grass, *Halophila ovalis* dominated area.