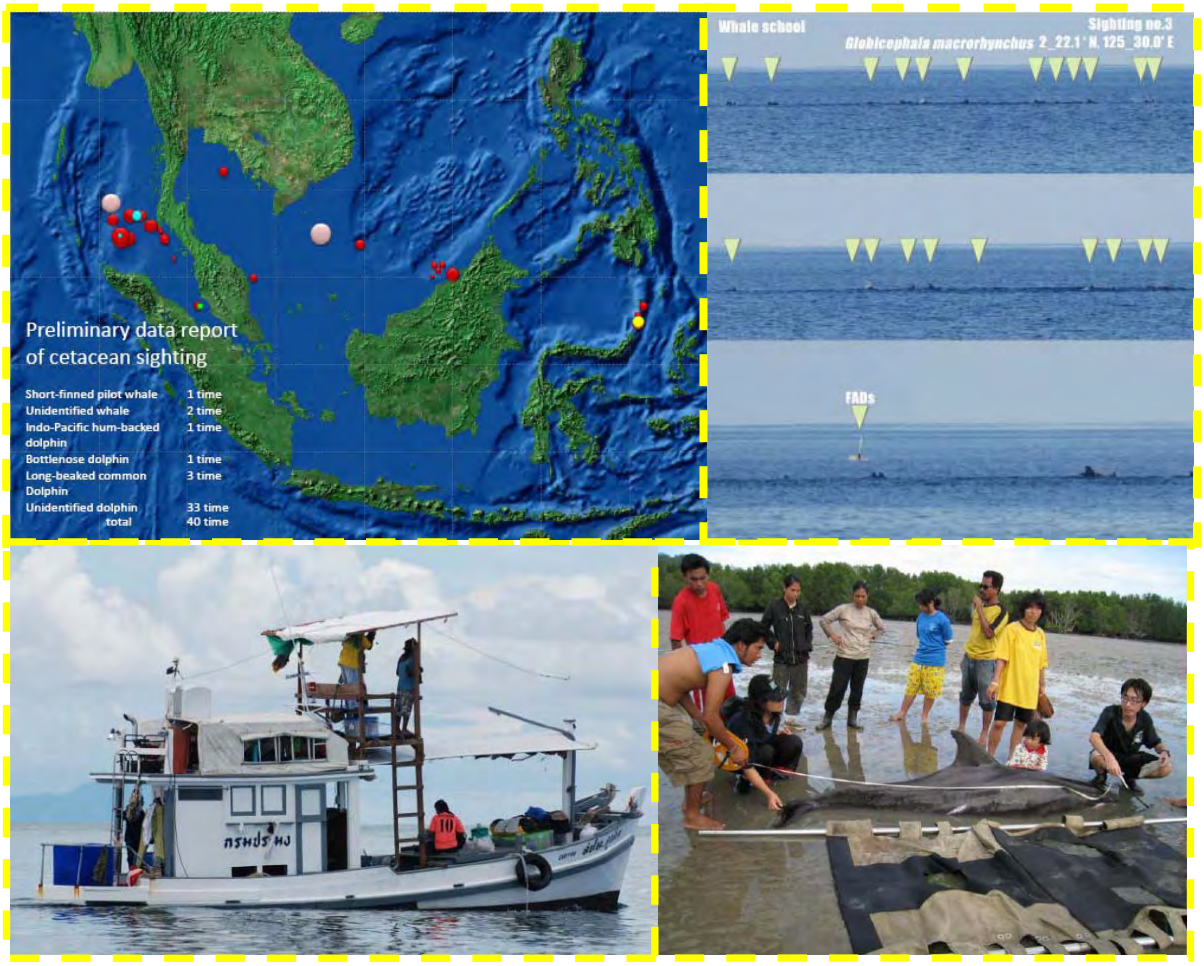
REPORT OF THE 1ST REGIONAL WORKSHOP ON
INFORMATION GATHERING AND CETACEAN RESEARCH
IN THE SOUTHEAST ASIAN WATERS

30-31 July 2009
SEAFDEC Training Department, Thailand



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I. INTRODUCTION AND OPENING OF THE MEETING

1. The 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters was organized by the SEAFDEC Training Department in Thailand from 30 to 31 July 2009. The Workshop was attended by experts and researchers responsible for cetacean research from Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam as well as from the SEAFDEC Secretariat and Training Department. The List of Participants appears as **Annex 1**.

2. The Secretary-General of SEAFDEC, *Dr. Siri Ekmaharaj* in his Opening Address, welcomed the participants and thanked them for attending the Workshop, and indicated the need to address the question often asked by the SEAFDEC Member Countries on why many cetaceans have been frequently stranded in the coastal areas in the Southeast Asian region. He also mentioned that while many countries have focused their cetacean research on conservation, SEAFDEC would pursue more efforts on the interaction between the cetaceans and the fishery resources and habitats in order to address the abovementioned concern. He added that in fact, it is for this purpose that the SEAFDEC Training Department with funding support from the Japanese Trust Fund, embarked on the Cetacean Research in the Southeast Asian Waters: Cetacean Sighting Program, to collect data and information on cetaceans that are relevant to their interaction with fisheries. After expressing the hope that the workshop as envisaged, would serve as a forum for researchers in the region to share and exchange information on cetaceans, he declared the Regional Workshop opened. His Opening Address appears as **Annex 2**.

3. The Chairman of the Workshop, *Dr. Worawit Wanchana* of the SEAFDEC Training Department (SEAFDEC/TD) briefed the participants on the background as well as on the rationale and objectives of the Workshop (**Annex 3**). He reiterated that aside from the main objective of discussing the cetacean research program in the Southeast Asian countries, the Workshop also aims to gather cetacean data and information in order to prepare a check list of cetacean species found in the Southeast Asian waters based on the respective countries' and SEAFDEC's cetacean sighting surveys; gather information on whale and dolphin hotspots in the countries in the region; share and exchange information on the appearance of cetaceans in the coastal areas in the region; and discuss the interaction between the large cetaceans with the coastal resources and habitats in order to develop the future cetacean research program that would be beneficial to the region.

4. The agenda which appears as **Annex 4** was adopted.

II. CETACEAN RESEARCH IN SOUTHEAST ASIAN WATERS: SEAFDEC INITIATIVE

2.1 Cetacean Sighting Program of SEAFDEC

5. In the presentation of the overview of Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program (**Annex 5**), *Dr. Somboon Siriraksophon* of the SEAFDEC Secretariat mentioned the

various fora that have been convened to promote the conservation of marine mammals in the region, such as the small cetaceans and dugongs which have been continuously exposed to various threats. Considering the rapid decline of the fishery resources in the region, Dr. Somboon also cited the attempts made by the stakeholders to enhance the resources through rehabilitation programs, protection of coastal habitats, establishing fisheries refugias, deploying artificial reefs, among others. In addition, awareness building on the conservation and management of the fishery resources had been put in place through the implementation of the Code of Conduct for Responsible Fisheries.

6. However, he added that the recently frequent stranding of cetaceans in the coastal areas to feed made it necessary for SEAFDEC to conduct the Cetacean Sighting Program in order to collect scientific information on the distribution and composition of cetacean species in the Southeast Asian waters as well as assess the interaction and the degree of the impact of the cetaceans to the fishery resources and habitats. In this connection, Dr. Somboon specified that SEAFDEC would continue to collect relevant data and information while the SEAFDEC researchers are onboard the M.V. SEAFDEC 2 during the conduct of the SEAFDEC collaborative marine research surveys in the waters of the SEAFDEC Member Countries.

2.2 Whales and dolphins in the Southeast Asian Waters

7. A report on the cetaceans such as whales and dolphins found in the Southeast Asian waters (**Annex 6**), based on the preliminary results of the whale sighting program using the M.V. SEAFDEC 2 was reported by *Mr. Nakaret Yasook* of the SEAFDEC/TD. The report discussed the progress of the activities in 2008 and 2009 as well as the results of the five (5) sighting surveys that have been carried out in the Southeast Asian waters when the M.V. SEAFDEC 2 was on its usual cruise schedules.

8. Based on the initial results of the whale sighting program, Mr. Nakaret mentioned that the initial distribution of the cetaceans have been established by SEAFDEC based only on the sighting surveys and added that the abundance and population of the cetaceans could not be determined at the moment as more data would be needed to estimate the population, and more sighting surveys should be conducted to verify the results.

9. With regards to the difficulties encountered by the SEAFDEC researchers in identifying the cetacean species during the sighting surveys, the Workshop suggested that in the future, joint surveys could be conducted with the Member Countries as well with the various NGOs where researchers with experience and expertise in marine surveys could be tapped to assist in the whale sighting surveys as well as provide training during the surveys specifically on the identification of the species. Moreover, in order to validate the results of the sighting surveys, the use of video recorders was also suggested in addition to the use of still cameras.

10. Since under its Cetacean Research Program, SEAFDEC with the assistance of experts from Japan, had already developed a log sheet for the collection of data and information on cetaceans during the sighting surveys, the Workshop suggested that the log sheet could be shared with the Member Countries in order that this could be streamlined and improved for more efficient comparison of the data and information collected on the cetaceans in the Southeast Asian region.

III. CETACEAN RESEACH IN SOUTHEAST ASIA AND JAPAN: COUNTRY REPORTS

<u>Cambodia</u>

11. The Report on the Coastal Cetacean and Mekong Dolphin Research and Conservation in Cambodia (**Annex 7**) presented by *Mr. Phay Somany*, indicated that the cetacean research in Cambodia started in 2001 when the Fisheries Administration (FiA) of Cambodia (until 2001 was

known as the Department of Fisheries) collaborated with the Wildlife Conservation Society (WCS) to conduct research on marine mammals to assess the abundance, distribution and broad habitat preferences of marine mammals such as whales, dolphins, porpoises and dugongs in the coastal waters of Cambodia. This was followed by more collaborative efforts with various NGOs in order to enhance the country's cetacean research as well as to promote public awareness on the marine mammals.

12. Moreover, he added that in 2004, the FiA collaborated with the World Wide Fund for Nature (WWF) and the WCS for the establishment of the Cambodian Mekong Dolphin Conservation Project (CMDCP) and implemented activities related to the conservation of the Irrawaddy dolphin using the Cambodian Mekong Dolphin Conservation Strategy consisting of conservation activities, education and awareness, research, and regional cooperation and coordination.

13. As for the mortality of the Irrawaddy dolphins in Cambodia, he pointed out that entangling with gill nets has been considered one of the major causes. However, for the mortality of the calves, he observed that this might could be due to the infectious and opportunistic bacteria known as the *Aeronomas hydrophila* which attacks the calves when their immune system has weakened. This could be brought about by the impacts of chemical substances present in the waters such as PCB, DDT and mercury that lead to the weakening of the immune system of the Irrawaddy dolphins especially among the calves.

Indonesia

14. The report on the cetacean research activities in Indonesia (**Annex 8**) as presented by *Mr. Dharmadi*, showed that under the Indonesian Oceanic Cetacean Program, many institutes and agencies have been involved in the various related activities that started in 2001. The Program consists of an integrated research approach comprising four major components, namely: acoustic surveys of oceanic cetaceans to examine the distribution and abundance of all species, and identifying the sensitive marine areas of special significance to resident and migratory cetaceans; detailed ecological research on deep dicing oceanic cetaceans such as the sperm whale; establishment of successful active participation in cetacean monitoring program for the diving industry and other interested groups; and oceanic conservation activities and educational program focusing on marine environmental issues.

15. Regarding the traditional hunting of cetaceans by local people, he explained that this is allowed only in small villages in Lamalera in Lembata Island and Lamakera in Nusa Tenggara Timur. The gear used in the traditional whaling are simple such as knives and string, and the hunters use boats without engines locally known as Paledang. The cetaceans caught by the hunters in this traditional whaling are consumed fresh or processed through salting and drying.

Malaysia

16. The progress of the Program on the Conservation and Management of Endangered Species: Marine Mammals of Malaysia (**Annex 9**), which was reported by *Mr. Mohd Lazim bin Mohd Saif*, includes the initial outcome of the research on the whale and dolphin groups as well as on dugongs. The information had been collected through the stranding data in the coastal areas of Malaysia, and through the sighting activities as well as through questionnaire surveys. The report also indicated that the traditional hunting for cetacean meat especially in Sabah, could contribute to the dwindling number of cetaceans in the Malaysian waters.

Myanmar

17. In the country report of Myanmar (**Annex 10**) presented by *Mr. Han Win*, research and conservation of endangered aquatic animals in Myanmar waters was initiated in 1996 through a boat-based visual survey for coastal cetaceans, and followed later by collaborative surveys with NGOs and other countries. In 2002 through a collaborative effort between the Department of Fisheries of Myanmar and the Wildlife Conservation Society (WCS), a visual boat-based survey of the entire Ayeyarwaddy River was conducted to examine the population of the Irrawaddy dolphins.

18. He also mentioned that the cooperative fishing by the cast-net fishermen and the Irrawaddy dolphins in the Ayeyarwaddy Rivr of Myanmar is a form of traditional fishing that has not been described in the world fisheries record. As reported, the fishermen call the attention of the dolphins through acoustic and audio signals such as tapping the sides of their canoes using a conical wooden point or lead weights or paddle or by making guttural sounds through their mouths. Upon hearing the calls, the dolphins would respond by visual signals through the positions of their tail flukes. Showing their flukes up and down to the surface very slowly means schools of fish are not found in such area. When the dolphin swims towards another place, the fishermen understand that they should follow the direction of the dolphins with their canoes. When the dolphins show their flukes up in the water surface pointing to the sky, it means that fish is abundant in that area, and the fishermen should stop their canoes and wait for the proper time to throw their nets. Considering that such understanding and cooperation between the Irrawaddy dolphins and the cast-net fishermen of Myanmar in this cooperative fishing is very unique, efforts have been made by stakeholders to conserve the Irrawaddy dolphins since recent reports have indicated that the dolphin population in the Ayeyarwaddy River has been dwindling.

Philippines

19. The progress of the research, conservation and management of cetaceans in the Philippines (**Annex 11**) as reported by *Dr. Mugjekeewis S. Santos*, indicated that such efforts have been conducted in collaboration many government agencies, the academe as well as NGOs. Records have shown that as early as 1935, the Philippines had already initiated cetacean research to determine the distribution and species of cetaceans found in the country. The studies continued through the years, and in 1994, the Philippines formulated its national plan of action for cetaceans that included survey and research; habitat and resource management; policy formulation; and public information, education and capacity building. With the passage of laws, most cetaceans found in the country are now being protected.

Thailand

20. The progress of the cetacean research in Thailand (**Annex 12**) was reported by *Mr. Opas Chamason*. He mentioned that cetacean research is being conducted by the Department of Fisheries (DOF) of Thailand in collaboration with the Department of Marine and Coastal Resources (DMCR). The DOF collects cetacean data from commercial as well as from research vessels. The DOF collection area is divided into five, namely: the Eastern Part of the Gulf of Thailand; the Upper Gulf of Thailand; Central Part of the Gulf of Thailand; the Lower Gulf of Thailand; and the Andaman Sea.

21. The status of the research on cetaceans in Thailand monitored by the DMCR (**Annex 13**) as reported by *Mr. Somchai Munanansap*, indicated that a systematic study on whale and dolphin biology in Thailand was initiated in 1993 by researchers of the Phuket Marine Biological Center with the cooperation of some foreign researchers. In addition, data on cetacean distribution were also collected through the stranded and dead specimens as well as through direct sighting surveys. Interviews and at-sea surveys have also provided the DMCR with information on the cetacean distribution in the waters of Thailand.

22. Specifically, the progress of the cetacean researches conducted by the Phuket Marine Biological Center (**Annex 14**), which was reported by *Mr. Kongkiat Kittiwattanawong*, indicated that the research had been carried out through interviews, land-based observation, boat surveys, line transect survey, aerial surveys, use of acoustic techniques; and cooperation with local communities. During the data collection, the social interaction and feeding behavior of the cetaceans have also been monitored. Opportunistic sightings were also monitored through the diving operators, transportation system in regular sea routes, fisheries patrol boats, and through the SEAFDEC collaborative survey with Thailand. Specific studies have also been conducted that include stomach contents analysis, pathology and parasitology, aging through tooth and bones or fossil records, heavy metal analysis, and DNA analysis to determine the population structures and inter-specific relationships. Development of database and GIS as well as information dissemination through various media has also been promoted.

Vietnam

23. The country report of Vietnam (**Annex 15**) presented by *Mr. Han Bach Van*, indicated that little information is available on the status of cetaceans such as whales and dolphins in the country. Although not statistically monitored, whales and dolphins have been observed by fishers while fishing and/or sailing in the offshore and near shore waters as well as in and around the river mouths. However, few studies have been conducted to examine the occurrence and distribution of these mammals as well as on the population sizes and biology.

Japan

24. The country report of Japan (**Annex 16**) was introduced by *Dr. Shigeki Takaya* and discussed further by *Dr. Toshihide Iwasaki*. The report indicated that cetacean resources can be utilized within the limit of sustainability under the science-based management. In Japan, three main organizations work on research activities for sustainable use of the cetacean resources, namely: National Research Institute of Far Seas Fisheries (NRIFSF) for the population assessment of target species for existing domestic cetacean fisheries and population assessment of IWC species; Institute of Cetacean Research (ICR) for the population assessment of IWC species; and Tokyo University of Marine Science and Technology for the population assessment of IWC species.

IV. DATA AND INFORMATION ON CETACEANS IN SOUTHEAST ASIAN WATERS

25. The data and information on cetaceans in the Southeast Asian waters as reported by the countries in the region include: Cetacean Species in the Southeast Asian Waters (**Annex 17**); Cetacean Conservation Measures Undertaken by the Southeast Asian Countries (**Annex 18**); and Recommendations and Follow-up Actions on Cetaceans as Suggested by the Countries in Southeast Asia (**Annex 19**).

26. Considering the difficulties in conducting biological studies on cetaceans, the Workshop suggested that opportunistic study through post-mortem data analysis may be conducted on stranded species or non-lethal sampling through the analysis of the genetic structure. As for monitoring the migratory pattern, it was suggested that tagging of the cetaceans could be further explored. However, it has been observed that migration also depends on the quality of the fishing grounds especially in terms of better environment and improved fishing grounds. Furthermore, in the sighting surveys, duplications in the counting and recording could be avoided through the use of the photo ID method.

27. From the country reports, the whale and dolphin watching/sighting hotspots in the Southeast Asian waters have also been identified and summarized in **Annex 20**; information of artificial habitat

and cetacean hotspot (in Thailand) have not presented definite conclusion on the relationship between cetacean and their pray around artificial habitat (**Annex 21**);

V. STATUS OF IRRAWADDY DOLPHIN POPULATION

Status of Irrawaddy Dolphins in the Mekong River

28. The status of the Cambodian Mekong Dolphin Conservations Project (**Annex 22**) was reported by *Mr. Phay Somany*. He reiterated that the FiA of Cambodia started its research on the Mekong River dolphins in January 2001 with the collaboration of James Cook University and the Wildlife Conservation Society (WCS), paving the way for the establishment of the Cambodian Mekong Dolphin Conservation Project (CMDCP) in July 2005. The main task of the CMDCP is to implement the Mekong dolphin conservation strategy.

29. Considering that Cambodia and Lao PDR share the Mekong River area where the Irrawaddy dolphins are known to survive, the report on the Aquatic Resources Management and Conservation of the Critically Endangered Mekong Irrawaddy Dolphin, *Orcaella brevirostris* in Lao PDR (**Annex 23**) was presented *Mr. Akhane Phomsouvanh* in order to assess the fate of the Irrawaddy dolphins in the transboundary pool of the Mekong River area. Specifically, the project Lao PDR started in 1993 when the fisheries community zone at Ban Hang Khon was established and the village rules on fishing activities were also developed. In 2008, the project was launched with the main objective of assessing the local community livelihood development through improving management of wetland resources at the transboundary pool especially the wild capture fisheries and dolphin conservation and associated tourism; strengthening the cooperation between Lao PDR and Cambodia for the management of aquatic resources at the transboundary pool; and establishing conservation solution for the last population of Irrawaddy Dolphin (*Orcaella brevirostris*).

30. During the discussion, the Workshop was referred to the Tagal System of Sabah, Malaysia which could be used as an example of a natural river conservation strategy in order to address the concerns on dwindling fishery resources in a riverine system, brought about by the degradation of fish habitats and overfishing as well as the use of illegal fishing methods and practices.

VI. RECOMMENDATIONS FOR FUTURE CETACEAN RESEARCH PROGRAM IN THE SOUTHEAST ASIAN WATERS

31. The Workshop endorsed the recommendations for future Cetacean Research Program in Southeast Asia which appears as **Annex 24**.

VI. CLOSING OF THE WORKSHOP

32. The Deputy Secretary-General of SEAFDEC, who is concurrently the Deputy Chief of the SEAFDEC Training Department and Trust Fund Program Manager, *Mr. Hideki Tsubata*, congratulated the participants for coming up with the future plans for cetacean research that would be beneficial for the Southeast Asian region, within a short period of time allocated during the Workshop. After expressing the hope for the realization of the future cetacean research program, he declared the Workshop closed. His Closing Remarks appears as **Annex 25**.

Annex 1

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Annex 2

OPENING REMARKS
By SEAFDEC Secretary-General

The 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters

At SEAFDEC/TD
30-31 July 2009

Representatives from the SEAFDEC Member Countries,
Distinguished guests,
Ladies and Gentlemen, Good Morning:

First of all, on behalf of SEAFDEC, I would like to welcome all of you to the Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters. This is the 1st workshop under the "Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program" which was initiated by the SEAFDEC Training Department and funded by the Japanese Trust Fund.

We all know that most large cetaceans are highly migratory species. Recently, large cetaceans such as the blue whale, Flake killer whale, Bryde's whale, and Humpback Whale Calf, have been recorded frequently in the coastal areas in the region. What brought these large cetaceans to the coastal habitat and the interaction that exists was among the questions raised by the member countries during the SEAFDEC Council Meeting. Most of the existing cetacean researches conducted by environmental agencies and NGOs in the region are focused on conservation only. Fisheries sectors in many countries have developed programs on Dolphin Conservation as well as standing stock/population studies in cooperation with NGOs such as in the Philippines, Lao PDR, Myanmar, Malaysia, Thailand, Indonesia, Cambodia and Vietnam. However, not many cetacean research studies focus on the interaction between cetaceans and the fisheries resources/habitats. Therefore, the SEAFDEC Training Department initiated the "Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program" starting with the collection of data and information on Cetaceans including species, distribution and its interaction with fisheries resources/habitats.

Ladies and Gentlemen, we hope that this 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters will be a forum for researchers in the region to share/exchange information on cetaceans. On behalf of SEAFDEC and as the Chief of SEAFDEC TD, I very much look forward to your active participation in the discussions during this meeting. I hope we will come up with conclusions and suggestions for the future research programs on cetaceans that would benefit this region. Thank you very much and good day.

Annex 3

PROSPECTUS

The 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters

I. Introduction

In Southeast Asian waters, many questions are always raised up that "do we have large cetacean such as whale rather than dolphin whale existed in the coastal areas". As it is noted that most of large cetacean are highly migratory species in the Ocean not often found on the continental shelf or coast areas. However, recently, the large cetacean such as blue whale, Flake killer whale, and Bryde's whale, Humpback Whale Calf, etc. have been recorded frequently in the coastal areas in the region. How interaction of large cetacean to the coastal habitat is one of the questions raised up by member country during the SEAFDEC council meeting due to the present declining of fish stock in the coastal area. Consideration for the existing cetacean research in the region, most of research works are focused conservation of the cetacean by the environment agency, NGOs and fisheries sectors. Fisheries sectors in many countries have developed Programs on Dolphin Conservation, standing stock/population study in cooperation with the NGOs such as in the Philippines, Lao PDR, Myanmar, Malaysia, Thailand, Indonesia, Cambodia and Vietnam. In addition, there are not many cetacean research have been made by term of interaction to fisheries resources/habitats.

In 2008, SEAFDEC proposed to conduct/study on the cetacean in the Southeast Asia waters under the supported by Japanese Trust Fund on the "Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program" with the aims 1) To make inventory of cetacean species found in the Southeast Asia Waters through the cetacean sighting program on research vessel namely MV SEAFDEC2 and national research vessel, 2) To gathering of information of the accidentally death of cetacean on the coastal areas of the region, 3) To enhance the human resources capacity on the cetacean research work in the region, 4) To disseminate the information of Cetacean Species distributed in relation to their habitat/coastal ecosystem in the Southeast Asia waters and 5) To study on the interaction of migrated large cetacean to the marine coastal ecosystem/habitat. In this regard, SEAFDEC plan to organize the Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters in order to analyze the status of cetacean works in the region and to provide forum to member countries to share/exchange and raise up the national issues related to cetacean research for discussion and consideration for future plan under the project and for seeking the funding support. It is expected that based on the existing data/information gathering from member countries and by SEAFDEC survey will be useful and directive SEAFDEC to further works/analysis at the regional point of views which will be benefit to all member countries in the region.

II. Objectives of the Workshop

1. To review and discuss on the cetacean research program in the Southeast Asian countries;
2. To gather the cetacean data/information and make to check list on cetacean species existing in the Southeast Asia waters based on member countries and SEAFDEC sighting survey.
3. To gather the information on whale/dolphin watching spots existing in the member countries,
4. To share/exchange information on appearance of large cetacean in the coastal areas and or on the seashore.
5. To discuss on the interaction to the coastal resources/habitats by the large cetacean and future research program.

III. Expected Outcomes

1. Inventory of the cetacean species, whale/dolphin watching hotspots in the Southeast Asia waters,
2. Inventory of dead cetacean appearance in the coastal areas and on seashore
3. Future program on the cetacean research to assist member countries
4. Better understanding on the cetacean research on the interaction of large cetacean to the coastal resources/ habitats

IV. Date and Venue:

The Regional workshop will be convened in SEAFDEC/Training Department, Samut-Prakan, Thailand from 30-31 July 2009 (see Map01).

V. Participants:

It is envisaged that the participants for the regional workshop will be the following:

1. A Representative from all ASEAN-SEAFDEC Member Countries: A researcher/expert responsible for Cetacean research.
2. Representatives from SEAFDEC Secretariat and Training Department.
3. Resource persons from Fishery Research Agency, Japan, and other Institution on Cetacean Research.
4. Representatives from NGOs who working on Cetacean Research in the Southeast Asia

Annex 4

AGENDA

Time	Activities	Chairman/ facilitator
30 July 2009		
08:30-09:00	Registration	
09:00-09:15	Opening by SEAFDEC Secretary General	Dr. Worawit Wanchana
09:15-09:30	Background and rational of cetacean research in Southeast Asian Waters: Cetacean sighting program- Dr. Somboon Siriraksophon (SEAFDEC/SEC)	
09:30-10:00	Whale and dolphin found in the Southeast Asian Waters through the whale sighting program using M.V. SEAFDEC2- Mr. Nakaret Yasook (SEAFDEC/TD)	
10:00-10:30	Group photo and coffee break	
10:30-11:00 11:00-11:30 11:30-12:00	Country report &discussion o Cambodia - Mr. Phy Somany o Indonesia - Mr. Dharmadi o Lao_PDR - Mr. Akhane Phomsouvanh	Mr. Isara Chanrachkij
12:00-13:30	Lunch	
13:30-14:00 14:00-14:30 14:30-15:00	Country report &discussion o Malaysia - Mr. Mohd Lazim bin Mohd Saif o Myanmar - Mr. Han Win o The Philippine - Dr. Mudjekeewis S. Santos	Mr. Isara Chanrachkij
15:00-15:30	Coffee break	
15:30-16:00 16:00-16:30 16:30-17:00	Country report &discussion o Thailand - Mr. Opas Chamason (DOF/Thailand) o Status of cetacean in Thailand - Mr. Somchai Munanansap (DMCR/Thailand) o Cetacean research in Thailand - Dr. Kongkeit Kitiwattanawong (DMCR/Thailand)	Dr. Worawit Wanchana
18:00-20:00	Welcome reception	
31 July 2009		
09:00-09:30 09:30-10:00	Country report &discussion o Vietnam - Mr. Bach Van Hanh o Japan - Dr. Toshihide IWASAKI	Mr. Isara Chanrachkij
10:00-10:30	Whale/Dolphin watching hotspot in Southeast Asia – Mr. Sayan Promjinda (SEAFDEC/TD)	
10:30-11:00	Coffee break	
11:00-12:30	Discussion on declining Irrawaddy dolphin population in the Mekong river	Dr. Worawit Wanchana
12:30-13:30	Lunch	
13:30-15:00	Recommendations for future cetacean research program in the Southeast Asia Waters	Dr. Worawit Wanchana
15:00-15:30	Coffee break	
15:30-16:00	Network and Cetacean Specialist group in the Southeast Asia	
16:00-16:15	Closing by SEAFDEC Deputy Secretary General	

Annex 5

Background and Rational of Cetacean Research in Southeast Asian Waters: SEAFDEC Cetacean Sighting Program

Dr. Somboon Siriraksophon , Policy and Program Coordinator, SEAFDEC/Secretariat, somboon@seafdec.org

Cetacean Research Program in Southeast Asian Waters:

Somboon Siriraksophon
Sayan Promchinda
Nakarek Yasook

1

Introduction (1)

- Marine mammals in Southeast Asia (small cetaceans and dugongs) are exposed to a number of threats
- The Convention on Migratory Species (CMS) looks back on conserving program in the Region,
- The first International Conference on Marine Mammals of South East Asia held in the Philippines in 1995,
  - ✓ Initiatives on survey to Improving knowledge on migratory behavior, and distribution
  - ✓ Study on by-catch of cetaceans and dugongs in fisheries
  - ✓ Emphasized the scope of its Marine Mammals Action Plan
  - ✓ Raising of awareness of conservation threats

2

Introduction (2)

- The 2nd International Conference on Marine Mammals of South East Asia held in the Philippines in 2002, the associated WS on the Biology and Conservation of Small Cetaceans and Dugongs of Southeast Asia
  - ✓ Discussed the various concerns and research needs of Southeast Asian countries
  - ✓ Study on Stock of cetaceans and dugongs population,
  - ✓ stock structure and abundance of populations and distribution
  - ✓ Assessment of the impact of by-catches

3

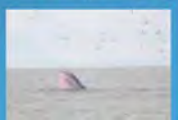
Introduction (3)

- Rapid declining of fisheries resources since 1980s
- Many attempts have being worked on the enhancing of fisheries resources through
  - Rehabilitation program,
  - protection of coastal habitats,
  - Establishing fisheries refugia,
  - Deploying of artificial reefs, etc
- The aims are to reserve fishes for people, to secure the livelihoods of fishers along the coastal areas
- Awareness building on conservation and management of fisheries resources has being put in place through the implementation of the CCRF for responsible fisheries and practices

4

Introduction (4)

- Interactions between cetaceans and longline fisheries have been studied since 1970s.. For instance, on Patagonian toothfish in the Southern Ocean in 1980s
- Recently, many large cetaceans appears close to the coastal habitats for feeding,
- Few works on the interactions between large cetacean and habitats ?
- Degree of impact of the large Cetaceans to the fisheries resources needed to be clarified?
- How SEAFDEC Involvement on the issues?




5

Project Objectives

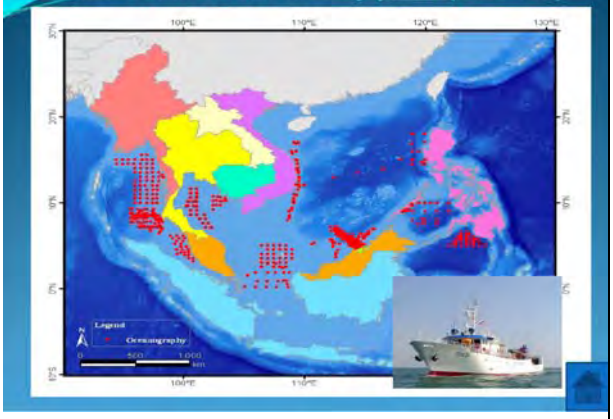
"The objective of the program is to collect scientific information on the distribution and composition of Cetacean species in Southeast Asian Waters. The data and information would be collected using the M.V. SEAFDEC2 based on her existing cruise plans.

Specific objectives:

1. To make inventory of cetacean namely whale and dolphin found in the Southeast Asia Waters through the whale watching program on SEAFDEC research vessel such as MV SEAFDEC2 and national research vessel
2. To enhance the human resources capacity on cetacean sighting program or cetacean research work in the region
3. To collect information of the accidentally death of cetacean on the coastal areas of the region
4. To study on the interaction between cetacean to the coastal ecosystem
5. To disseminate the information of Cetacean Species distributed in relation to their habitat/coastal ecosystem in the Southeast Asia waters

6

MV SEAFDEC2 survey plan (2004-8)



7

Human Resources Development

To enhance the human resources capacity on species identification and on population estimation of cetacean through cetacean sighting survey

Invited Resources Persons

1. Professor Dr. Hidehiro KATO
Professor of Marine Biology Cetaceans and Marine Mammals, Tokyo University of Marine Science & Technology

2. Dr.Hideyoshi YOSHIDA
Scientist, Cetacean Population Biology, National Research Institute of Far Seas Fisheries Oceanic Resources Division. FRA

8

Species Record found in SEA

4 Bryde's whale, off Bangsean (19Sep08)

30 False killer whale (6 june 08), Phuket

9

Literatures Reviews

Country	Topic	Type
Indonesia	Cetacean diversity and habitat preferences in tropical waters of East Kalimantan, Indonesia	Full text
	Komodo National Park cetacean surveys - A rapid ecological assessment cetacean diversity, dist	Full text
	Report of the workshop on interactions between cetacean and longline fisheries	Abstract
	Long-term visual and acoustic cetacean surveys in Komodo National Park, Indonesia, 1999-200	Full text
	Aquatic mammals assessment in Indonesian waters.	Full text
	Activity report: Indonesia oceanic cetacean program	report
	Solor-Alor visual and acoustic Cetacean surveys	Interm report
	(partly research area in) Marine mammals of Borneo: a preliminary checklist	Full text
Malaysia	Sarawak Dolphin Project- Half year report	report
	(partly research area in) Marine mammals of Borneo: a preliminary checklist	Full text
Myanmar	Status of Irrawaddy dolphins Orcaella brevirostris in the upper reaches of the Ayeyarwady river,	Full text
	Catch composition and conservation management of a human-dolphin cooperative cast-net fish	Full text
Philippines	Geographical distribution of polybrominated diphenylethers (PBDEs) and organochlorines in sma	Full text
	A Synopsis of the Mammalian Fauna of the Philippine Islands (p.48)	Full text
	Review of the Biodiversity of Southern Philippine Seas (p.27)	Full text
	Historical whaling report	report
	Challenges and lessons learned in setting-up a community-based whale shark ecotourism progra	Conference paper
Vietnam	NOTES ON TWO CETACEAN SURVEYS IN THE GULF OF TONKIN, VIETNAM	Full text
	Investigation of marine mammals in Vietnam	Full text
	Marine mammals of Vietnam: A preliminary checklist	Full text
Brunei	(partly research area in) Marine mammals of Borneo: a preliminary checklist	Full text
Thailand	PRELIMINARY AERIAL SURVEY ON MARINE ENDANGERED SPECIES AT SURATTHANI PROVINCE IN 2004	Full text (in Thai)
	PRELIMINARY SURVEY ON DOLPHIN IN HUAHIN BAY, PRACHUAP KHIRI KHAN PROVINCE	Full text (in Thai)
	Dolphin and whale surveys along the coastline of inner gulf of Thailand	Abstract
	Preliminary survey of Cetacean in the upper gulf of Thailand	Abstract
	[illegible]	Abstract
	[illegible]	[illegible]
	Records of cetaceans in Thailand	Abstract
	First record of a pygmy killer whale (Feresa attenuata) from Thailand	Abstract
Misc	REPORT OF THE SECOND WORKSHOP ON THE BIOLOGY AND CONSERVATION OF SMALL CETACEANS AND D	Technical paper
	Marine mammals survey techniques applicable in developing countries	Full text
	Worldwide Bycatch of Cetaceans	Technical paper
	Cetaceans in the Indian Ocean Sanctuary: A Review (p.17)	Report
	Status and conservation of facultative freshwater cetaceans in asia	Full text
	Preliminary analysis of geographic variation in cranial morphometric of the finless porpoise	Full text
	Marked declines in populations of Irrawaddy dolphins	Chapter
	Mekong River Dolphin under threat	Technical paper
	Abundance estimation of the Mekong Irrawaddy dolphin	report

10

Project Objectives

"The objective of the program is to collect scientific information on the distribution and composition of Cetacean species in Southeast Asian Waters. The data and information would be collected using the M.V. SEAFDEC2 based on her existing cruise plans.

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2. To enhance the human resources capacity on cetacean sighting program or cetacean research work in the region
3. To collect information of the accidentally death of cetacean on the coastal areas of the region
4. To study on the interaction between cetacean to the coastal ecosystem
5. To disseminate the information of Cetacean Species distributed in relation to their habitat/coastal ecosystem in the Southeast Asia waters

11

1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters

30-31 July 2009
at SEAFDEC/TD

12

Workshop Aims

- to analyze the status of cetacean works in the region and
- to provide a forum for the Member Countries to share/exchange experiences and raise certain national issues related to cetacean research.
- In addition, discussion and consideration for the future plans under the project would be facilitated and a proposal for seeking funding support would also be discussed.

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Program (day 1)

30 July 2009		
08:30-09:00	Registration	
09:00-09:15	Opening by SEAFDEC Secretary General	Dr. Worawit Wanchana
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10:00-10:30	Group photo and coffee break	
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12:00-13:30	Lunch	
13:30-14:00 14:00-14:30 14:30-15:00	Country report &discussion ○ Malaysia - Mr. Mohd Lazim bin Mohd Saif ○ Myanmar - Mr. Han Win ○ The Philippine - Dr. Mudjekeewis S. Santos	Mr. Isara Chanrachkij
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18:00-20:00	Welcome reception	

14

Day 2

09:00-09:30 09:30-10:00	Country report &discussion ○ Vietnam - Mr. Bach Van Hanh ○ Japan - Dr. Toshihide IWASAKI	Mr. Isara Chanrachkij
10:00-10:30	Whale/Dolphin watching hotspot in Southeast Asia – Mr. Sayan Promjinda (SEAFDEC/TD)	
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15:00-15:30	Coffee break	
15:30-16:00	Network and Cetacean Specialist group in the Southeast Asia	
16:00-16:15	Closing by SEAFDEC Deputy Secretary General	

15

Expected outcomes from WS

- Inventory of cetacean species and whale/dolphin watching hotspots in the Southeast Asian waters,
- Inventory of dead cetaceans appearing in the coastal areas and on seashores
- Future program on cetacean research to assist the Member Countries
- Better understanding of the cetacean research on the interaction of large cetaceans to the coastal resources/ habitats

16

Annex 6

Whales and dolphins found in the Southeast Asian waters through the whale sighting program using the M.V. SEAFDEC 2

Mr. Nakaret Yasook, Fishing Gear Technologist, SEAFDEC/TD, nakaret@seafdec.org

Whale and dolphin found in the Southeast Asian Waters through the whale sighting program using MV SEAFDEC2

Cetacean Research in Southeast Asian Waters

Nakaret Yasook & Whale Sighting Team

1

Introductions

Cetaceans are one of the most distinctive and highly specialized orders of mammals meant whales, dolphins, and porpoises. They include the largest animal that has ever lived, the blue whale; th highly intelligent and communicative dolphins, the tusked narwhals and blind river dolphins ar singing humpback whales, nearly eighty living species in all. Most species are marine but some dolphin species are found in both marine and fresh water such as Irrawaddy Dolphin (*Orcaella brevirostris*) which is patchily distributed in shallow near shore tropical and subtropical marine waters, often associated with estuaries and mangrove forest. They also occur far upstream in t Ayeyarwady (formally Irrawaddy) rivers system of Myanmar, Makhakam river system of Indone and Mekong river system of Lao, Cambodia and Vietnam.

At present, composition and abundant of cetacean species in the Southeast Asian waters are s not clear. Most of cetacean research has been conducted based on the field observation, and o specimens recording at shore. Not many research works has been conducted by sighting surve With regards to the survey plan of SEAFDEC Research vessels in the Southeast Asian waters, cetacean species such as dolphin and whale were often found by sighting. Every year, more tha 5,000 nm the research vessel, namely MV SEAFDEC2 has sailed to many sea areas in the region order to collect scientific information on the distribution and composition of cetacean species Southeast Asian waters, the cetacean research by SEAFDEC has been initiative since 2008

2

Objectives

- Inventory of all cetacean namely whale and dolphin found in the Southeast Asian Waters through the whale sighting program using SEAFDEC Research vessels; MV SEAFDEC2
- Information gathering of accidentally death of cetacean on the coastal areas of the region
- Information gathering of the whale watching program existed in the Southeast Asian countries
- Enhancement of the human resources capacity on the cetacean research works in region
- Dissemination of the species composition of cetacean and their distribution in relation to their habitat /coastal ecosystem in the southeast Asian Waters

3

Program Description

Information and data collection of cetacean species existed in the Southeast Asian waters will be conducted based on the sighting survey using SEAFDEC research vessels namely MV SEAFDEC and MV SEAFDEC2, and also based on the existing data/information in the region

4

Activities in 2008

In 2008, cetacean data and information existed in the SEAFDEC member countries were reviewed and analysis. Before conducting the sighting survey, consultation visit to Institute of Cetacean Research (ICR) and Toky University of Marine Science and Technology (TUMSAT) in Japan was mad In order to discuss and seek the technical support for future collaboratio The cetacean sighting surveys were conducted three times based on MV SEAFDEC2 survey cruises.

- 1st Sighting survey from Gulf of Thailand to Andaman Sea, Thailand in 3 March – 4 April 2008
- 2nd Sighting survey from Gulf of Thailand to Brunei Darussalam in 4 June – 5 July 2008
- Training Workshop on the Cetacean Research and Shipboard Training 2008 / 3rd Sighting survey from Gulf of Thailand to Andaman Sea , Thailar in 21November – 30 December 2008

5

Activities for the year 2009

Activity 1 : Workshop/Consultation Visit and Preparatory Works

- The 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters
  30 – 31 July 2009

Activity 2 : Information Gathering and Actual Survey by Research Vessel

- Actual Survey using SEAFDEC vessels
  - 4th Sighting survey from Gulf of Thailand to Brunei Darussalam in 6 March – 10 April 2009
  - 5th Sighting survey from Gulf of Thailand to Bitung, Indonesia in 23 April – 22 May 2009
- Information gathering on the cetaceans found in the region
- Information gathering on the Whale watching program in the SEA countries

Activity 3 : Data Analysis and Information Dissemination

- Data analysis
- Annual Evaluation on the outcomes and future plan

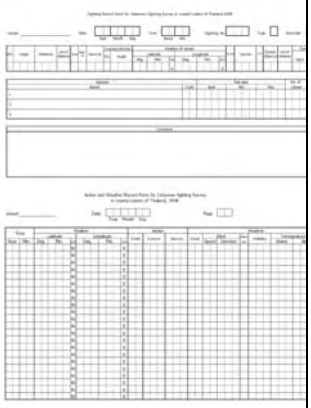
6

Expected Outcomes

- Inventory of all cetacean namely whale and dolphin found in the Southeast Asian Waters through the whale sighting program using MV SEAFDEC2.
- Information gathering of the accidentally death of cetacean on the coastal areas of the region.
- Information gathering on the whale watching programs existed in the Southeast Asian Countries.
- Enhancement of the human resources capacity on the cetacean research works in the region.
- Dissemination of the Species composition of Cetacean and their distribution in relation to their habitat/coastal ecosystem in the Southeast Asian waters.

7

whale sighting materials



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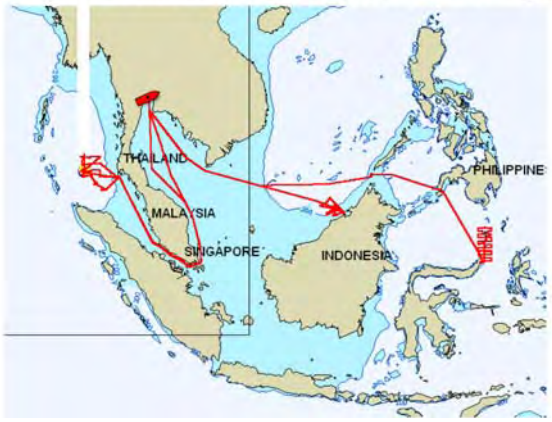
Cruise track of MV SEAFDEC2 (2008-2009)



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Preliminary data report of cetacean sighting

Short-finned pilot whale	1 time
Unidentified whale	2 time
Indo-Pacific hum-backed dolphin	1 time
Bottlenose dolphin	1 time
Long-beaked common Dolphin	3 time
Unidentified dolphin	33 time
total	40 time

Cruise no.	Date	Time	Latitude	Longitude	Number of found	Species
28-1/2008	20 Mar 08	10:00	7.1599	96.7249	2	Dolphin
	20 Mar 08	18:00	7.1596	96.7349	10	Dolphin
	21 Mar 08	18:30	7.1593	96.7367	20	Dolphin
	21 Mar 08	11:50	7.1600	96.7360	2	Whale
	21 Mar 08	10:30	7.1897	96.3012	40	Dolphin
	21 Mar 08	10:50	7.2904	96.2531	25	Dolphin
	22 Mar 08	17:00	8.5010	97.1727	10	Whale
	22 Mar 08	13:35	8.4913	96.7873	20	Dolphin
	22 Mar 08	13:40	8.4918	96.7873	6	Dolphin
	22 Mar 08	16:45	8.5097	97.1572	10	Dolphin
	23 Mar 08	7:13	8.5011	97.4747	10	Dolphin
	27 Mar 08	16:30	7.9247	97.9530	20	Dolphin
	30 Mar 08	8:30	7.7363	98.4227	2	Dolphin
	30 Mar 08	9:30	7.5691	98.5692	2	Dolphin
	30 Mar 08	11:35	7.1560	98.7167	10	Dolphin
	30 Mar 08	11:50	7.1000	98.7415	8	Dolphin
	30 Mar 08	12:56	6.9370	98.8194	2	Dolphin
	30 Mar 08	18:10	6.9233	99.2203	2	Dolphin
	31 Mar 08	10:13	7.2532	100.6234	7	Dolphin
	7 Apr 08	5:55	4.9567	103.2755	6	Dolphin
29-2/2008	6 Jun 08	16:30	7.5007	107.1167	10	Long-beaked common dolphin
	6 Jun 08	18:30	7.4211	107.5675	50	Long-beaked common dolphin
	7 Jun 08	5:25	6.8342	109.7836	10	Dolphin
	8 Jun 08	12:05	5.1341	115.0239	20	Dolphin
	13 Jun 08	7:00	5.9175	113.8338	2	Dolphin
	18 Jun 08	18:30	5.3672	114.1842	4	Dolphin
	22 Jun 08	17:00	5.7905	114.4242	5	Dolphin
	24 Jun 08	18:35	5.5839	113.9673	5	Dolphin
	4 Jul 08	18:30	10.9676	102.0823	10	Dolphin
30-1/2008	28 Nov 08	12:32	3.3834	100.6505	2	Indo-Pacific hump-backed dolphin
	28 Nov 08	11:20	2.2334	100.7234	4	Bottlenose dolphin
	28 Nov 08	12:39	2.4002	100.6242	2	Dolphin
	3 Dec 08	18:25	6.2342	95.8605	15	Dolphin
	6 Dec 08	9:25	5.2997	95.7170	40	Long-beaked common dolphin
32-2/2009	5 May 09	10:55	2.7396	125.5029	5	Dolphin
	6 May 09	9:40	2.2341	125.8006	5	Dolphin
	6 May 09	9:40	2.2334	125.8006	8	Dolphin
	6 May 09	15:25	2.3673	125.5000	15	Short-finned pilot whale
	6 May 09	15:49	2.3170	125.5000	3	Dolphin
	6 May 09	16:15	2.2674	125.5003	15	Dolphin

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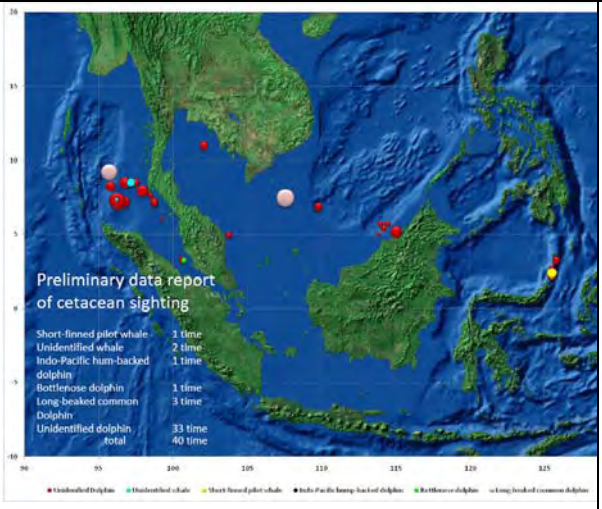

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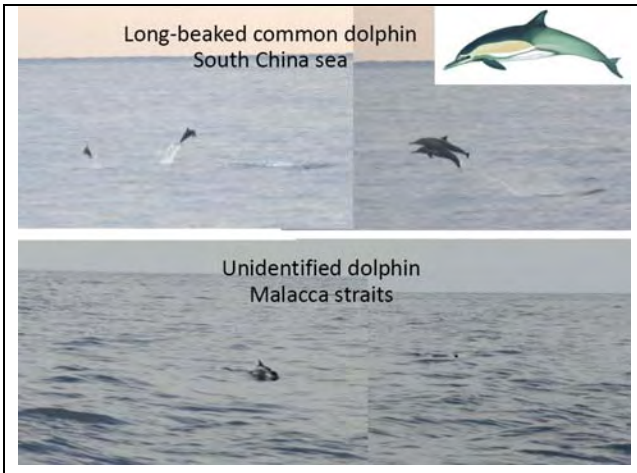
Short-finned pilot whale Sulawesi sea, Indonesia

12


Long-beaked common dolphin
South China sea

Unidentified dolphin
Malacca straits

10

Annex 7

Coastal Cetacean and Mekong Dolphin Research and Conservation in Cambodia

Mr. Phay Somany , Deputy Director of Fisheries Conservation Department,

Fishery Administration of Cambodia , phaysomany@yahoo.com

- Introduction The Cambodia's Department of Fisheries (currently called Fisheries Administration) in Collaboration with Wildlife Conservation Society (WCS) began research on marine mammals in the coastal area in January 2001. Prior to this study, a very few surveys were conducted. The aims of the study were to assess the abundance, distribution and broad habitat preferences of marine mammals (whales, dolphins, porpoises and dugongs) in the coastal waters of Cambodia.

- Between 2002 and the end 0f 2003, Cambodia's FiA in collaboration with WCS with Support from Ocean Park Conservation and PADI Foundations conducted the education and public awareness campaigns on marine mammals along the coastline of Cambodia through many aspects such as village meeting, provincial workshops, school and pagoda visits. The main objectives were to make the local fishermen and students aware of the importance of marine mammals, fisheries law, regulations of community fisheries and other relevant proclamations (Prakas) from the Ministry of Agriculture, Forestry and Fisheries.

- In 2004, Fisheries Administration collaboration with Department of Geography and Human Environmental Studies, San Francisco State University and Marine Endangered Species Unit, Phuket Marine Biological Center, Thailand, conducted the aerial survey on dugong along the coastline of Cambodia and Thailand. The overall goals of this research were to assess the present distribution and population of dugongs and their habitat on the eastern coast of the Gulf of Thailand, in Rayong, Chanthaburi, and Trat provinces in Thailand, and along the Cambodian coast and to provide recommendations on the management and conservation of dugongs in both countries. Interview with local villagers was also made to collect information about the way of life of the dugong and its role in the lives and history of local people.

- Between June 2004 and July 2005, Fisheries Administration in collaboration with WCS with support from OPCF established the marine mammal stranding programe along the whole coastline of Cambodia. The main objectives were to establish a permanent marine mammal stranding programe in the Department of Fisheries in response to the Government growing concerns about the marine mammals coming ashore in Cambodia. This programe would help return marine mammals to the sea, facilitate collection of data and assess threats faced by marine mammals, protect all species of marine mammals and provide important information for researchers.

- Between 2001 and September 2004, Department of Fisheries collaborated with WCS and James Cook University conducted the research on the Mekong Irrawaddy dolphin. The main objectives were to assess the abundance, distribution and conservation of Irrawaddy dolphins that inhabit the Mekong River. Result of this research allowed the Department of Fisheries developed the Cambodian Mekong Dolphin Conservation Strategy.

- At the end of 2004 up to now, Fisheries Administration in collaboration with World Wide Fund for Nature (WWF) and WCS established the Cambodian Mekong Dolphin Conservation Project (CMDCP) and has been implementing the activities of dolphin conservation using the Cambodian Mekong Dolphin Conservation Strategy consisted of "Conservation Activities", "Education and Awareness", "Research", and "Regional Cooperation and Coordination".

Marine mammal research in the coastal area of Cambodia (between February and July 2001)

The first boat-based marine mammal surveys in Cambodian waters were conducted over five discrete survey periods, spanning February to July 2001, totaling 161.3 hours of survey time and covering a total distance of 1653.1 km. This includes 109 hours of on-effort line transect surveys, covering 1129.7 km, complemented by 52.3 hours of off-effort surveys, covering 523.4 km. Focal areas thus far have been the inshore waters from Ream National Park east to Kampot and Kep, the southern portion of Kompong Som Bay (including Koh Rong and its satellite islands) extending north up the coastline to Koh Kong, and offshore waters (up to 120 km south-west of Kompong Som) encompassing the Koh Tang and Koh Polou Wai archipelagoes.

Map of the coastal area of Cambodia

- First survey covering the area of Ream National Park and Kompong Som Bay: 25 February to 1 March 2001
  - A total of 17.8 hours of survey was undertaken, covering 184 km of survey line
  - A total of seven cetacean groups were sighted. This included three groups of

Irrawaddy Dolphins, two groups of Finless Porpoise and two groups that were not seen clearly and classified as 'unknown species'

- Second survey covering the area of Kompong Som Bay, including Koh Rong and Koh Rong Samlem Islands: 23-26 March 2001
  - A total of 22.5 hours of survey was undertaken, covering 211.7 km of survey line
  - A total of seven groups of cetaceans were sighted, which included three groups of Irrawaddy Dolphins, two groups of Finless Porpoise, one group of Bottlenose Dolphins *Tursiops truncatus* (possibly *aduncus*-type), and one group of False Killer Whales *Pseudorca crassidens*.

- Third survey covering the area of Kompong Som Bay north to Koh Kong, and offshore to Koh Tang and Koh Polou Wai Archipelagoes: 20 to 29 April 2001
  - A total of 58.72 hours of on-effort survey was undertaken, covering 634 km of survey line. Additionally, a total of 8.4 hours of off-effort survey was undertaken, covering 89.5 km of survey line.
  - A total of 15 groups were sighted on-effort and 8 groups sighted off-effort. A total of seven species were sighted, which included one group of Long-beaked Common Dolphins *Delphinus capensis (tropicalis),* one group of Pantropical Spotted Dolphins *Stenella attenuata*, one group of Dwarf Spinner Dolphins *Stenella longirostris roseiventris*, four groups of Bottlenose Dolphins *Tursiops truncatus* (including possible *aduncus*-type), four groups of Indo-Pacific Humpback Dolphins*, Sousa chinensis*, two groups of Finless Porpoise, *Neophocaena phocaenoides*, nine groups of Irrawaddy Dolphins, *Orcaella brevirostris* and one group of unknown species.
  - The Long-beaked Common Dolphin, Pantropical Spotted Dolphin, Dwarf Spinner Dolphin and Indo-pacific Humpback Dolphin encounters all constitute new records for Cambodia.

- Fourth survey covering the area of Kampot and Kep: 22 - 25 June 2001
  - The route departed from Kampot township, south-east down Kampot River to the Bay. From the River mouth, we transversed west along the coastline to Koh Dong Island. From Koh Dong, the route then headed south for ten kilometers and then north-east, heading back to Kampot River mouth. Surveys were cut short due to heavy rain on return to the mouth of Kampot River.
  - A total of 3.35 hours of off-effort survey was undertaken, covering 36.2 km of survey line.
  - No marine mammals were sighted.

- Fifth survey covering the area of Kompong Som to Kep and offshore to Koh Tang: 21 –26 July 2001
  - The proposed route had to be modified somewhat due to adverse weather conditions on days one and two, which were spent in the more sheltered waters of Kompong Som Bay. Thereafter transect lines were run as initially intended, into the offshore waters around Koh Tang, before returning to inshore waters around Ream National Park, with the last two days spent conducting line transects in the waters between Ream National Park and Kep.
  - A total of 50.35 hours of on-effort survey was conducted, covering 495.5 km of survey line.
  - A total of six groups of cetaceans were sighted during surveys. A total of three species were sighted, which included two groups of Irrawaddy Dolphins, one group of Bottlenose Dolphins, one group of Indo-Pacific Humpback Dolphins and one group of unknown species.

- A total of 42 groups have been sighted during coastal surveys

Summary of species sighted during coastal surveys

Species	**# of Sightings**	**Average Group Size (range)**	**Total Sighted (low and high)**	**Average Depth (m) (range)**
Long-beaked Common Dolphin	1	43	43 (30-60)	45
Finless Porpoise	6	4 (1-10)	25 (20-35)	12.1 (1.5-26)
Irrawaddy Dolphin	16	6 (1-15)	103 (78-133)	6.7 (1.6-15.7)
False Killer Whale	1	62	62 (50-70)	26
Pantropical Spotted Dolphin	1	38	38 (25-60)	41
Indo Pacific Humpback Dolphin	4	6 (2-8)	25 (20-38)	5.2 (2.2-9.5)
Dwarf Spinner Spinner Dolphin	1	6	6 (5-8)	42
Bottlenose Dolphin	6	22 (6-62)	130 (97-171)	29.3 (21-36)
Unknown	6	3 (1-9)	19 (17-32)	17 (1.7-35)

Eight species have been identified from totals of 21 sightings on-effort and 21 sightings off-effort. Six of these constitute new country-records for Cambodia: False Killer Whale *Pseudorca crassidens*, a long-beaked form of Common Dolphin *Delphinus capensis (tropicalis*), Pantropical Spotted Dolphin *Stenella attenuata*, Dwarf Spinner Dolphin *Stenella longirostris roseiventris,* Bottlenose Dolphin *Tursiops truncatus* (including possible *aduncus*-type) and Indo-Pacific Humpback Dolphin *Sousa chinensis.* In addition, Finless Porpoise *Neophocaena phocaenoides* and Irrawaddy Dolphin *Orcaella brevirostris* have also been recorded.

Cetacean stranding reports have been investigated. Report includes the first country-record of Short-finned Pilot Whale *Globicephala macrorhynchus.* Marine mammal skeletal material has also been collected whenever encountered, thoroughly examined, labelled and deposited with the Department of Fisheries in Phnom Penh. Two species have been recorded based on skeletal specimens only, collected prior to this project's inception; Dugong *Dugong dugon* and a large Rorqual whale (either Fin Whale *Balaenoptera physalus* or Bryde's Whale *B. edeni*). This brings the total number of marine mammals recorded in Cambodian waters to eleven.

An initial assessment of threats indicates that there are several factors directly and indirectly impacting both inshore and offshore marine mammal populations. The most immediate concerns are marine mammal by-catch in various forms of monofilament gillnets, chiefly 'set-nets' and Spanish Mackerel nets, habitat degradation and over-fishing (hence cetacean prey species depletion), both through industrial-scale trawling of offshore waters by Thai fishing vessels and smaller-scale trawling and push-netting in inshore waters by a very large fleet of Cambodian boats. Live-capture for display is an increasing problem throughout much of Asia, and there is evidence of marine mammals being captured in Cambodian waters for this purpose. Other as yet unquantified factors may also pose threats to marine mammals, such as dynamite and poison fishing.

Although local fishermen do not directly hunt cetaceans (most of which are revered in Khmer folklore, a perception still firmly held amongst coastal communities to this day), interview evidence points strongly to Dugong populations suffering direct persecution, as their various body parts fetch high prices (the meat and internal organs for food, and the bones and teeth for traditional medicine).

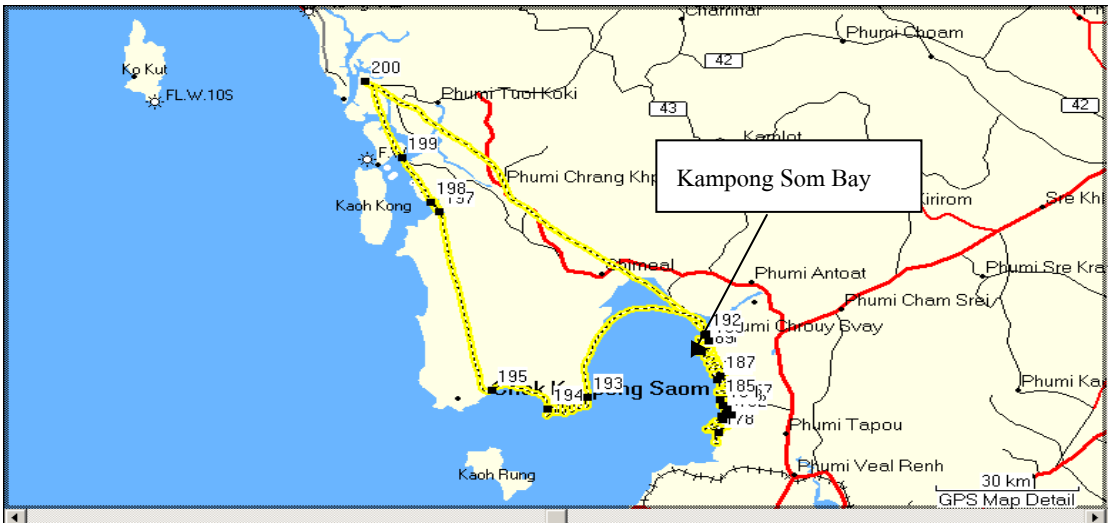
This is compounded by the loss and destruction of their specialized seagrass habitat. As such, Dugong is almost certainly the most highly threatened marine mammal in Cambodian waters.

Dugong Aerial survey in 2004

- In 2004, Department of Fisheries in collaboration with Department of Geography and Human Environmental Studies, San Francisco State University and Marine Endangered Species Unit, Phuket Marine Biological Center, Thailand, conducted the aerial survey on dugong along the coastline of Cambodia and Thailand. The overall goals of this research were to assess the present distribution and population of dugongs and their habitat on the eastern coast of the Gulf of Thailand, in Rayong, Chanthaburi, and Trat provinces in Thailand, and along the Cambodian coast and to provide recommendations on the management and conservation of dugongs in both countries. Interview with local villagers was also made to collect information about the way of life of the dugong and its role in the lives and history of local people.

The track of the aerial survey over the western coast of Cambodia on January 16th, 2004.

- Along the western coast of Cambodia, on January 16, we saw between 55 and 65 Irrawaddy dolphins (including 2 calves), 4 hump-backed dolphins, 9 finless porpoises (*Neophocaena phocaenoides*), 11 dolphins with species unclear, and 1 sea turtle. We had a total of 24 separate sightings of dolphins. The largest group size was of 15 Irrawaddy dolphins. Once we saw a mixed group of Irrawaddy dolphins and hump-backed dolphins. We did not see dugongs on either the 16th or 17th. On January 17th, we had a total of 11 sightings of dolphins. Within those sightings we saw 10 Irrawaddy dolphins, and 7 sightings with the species unclear

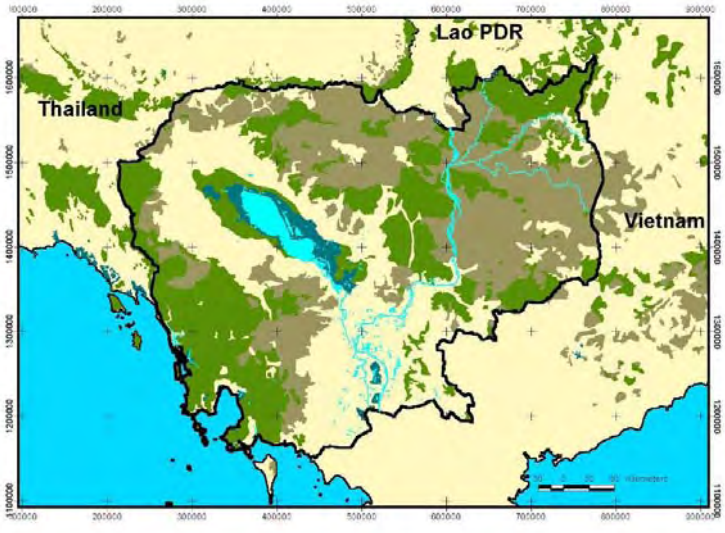


The track of the aerial survey over the western coast of Cambodia on January 17th, 2004.

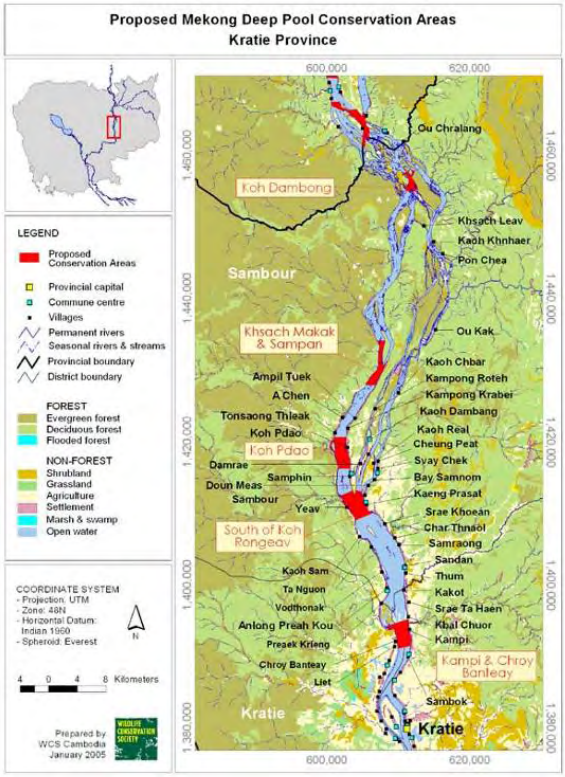
- On January 17th, while on our way from Koh Kong town to do boat-based seagrass surveys, we saw a mixed group of 4-6 hump-backed and 4 Irrawaddy dolphins, including one Irrawaddy calf.
- **No Dugong was seen as low tide at the survey time**

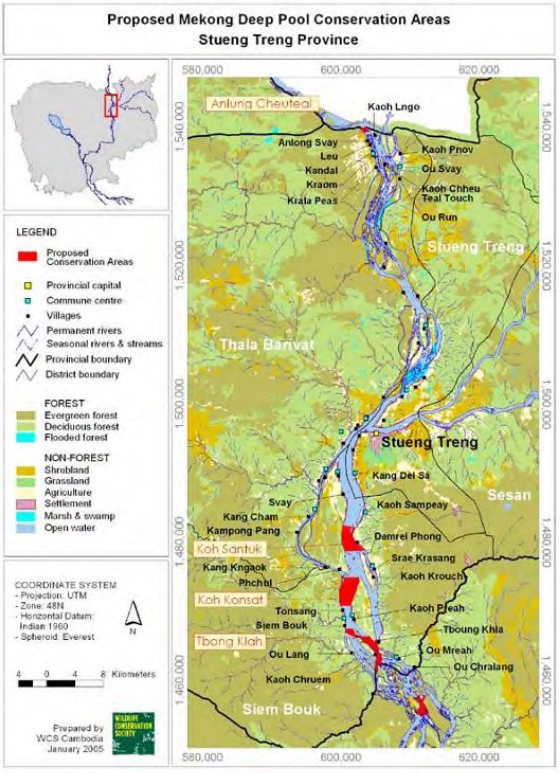
Mekong dolphin research

- *Between 2001 and September 2004, Department of Fisheries collaborated with WCS and James Cook University conducted the research on the Mekong Irrawaddy dolphin. The main objectives were to assess the abundance, distribution and conservation of Irrawaddy dolphins that inhabit the Mekong River.*



- As results, main biological habitats, kind of threats and total estimated population have been recovered and defined.





- From the end of 2004 onward, Department of Fisheries in collaboration with World Wide Fund for Nature (WWF) and WCS established the Cambodian Mekong Dolphin Conservation Project (CMDCP) and since then has been implementing the activities of dolphin conservation using the Cambodian Mekong Dolphin Conservation Strategy consisted of "Conservation Activities", "Education and Awareness", "Research", and "Regional Cooperation and Coordination.

- One of the activities in the research component is the dolphin survey. The main objectives are to determine estimated abundance of the Irrawaddy dolphin in the Mekong using best scientific methodology, produce a database of identified dolphins,
utilise the database to monitor: mortalities, distribution and movement patterns, social behaviour and disease and provide scientific information on Irrawaddy dolphin ecology to improve conservation planning and management.

- Prior to 2007, CMDCP was using simplistic direct count method to estimate dolphin population. Tendency to underestimate true population as it relies on the ability of the observers to sight all dolphins present in survey area. Given large size of dolphin habitat and elusiveness of the Irrawaddy dolphin this is extremely difficult.

- In order to get scientifically robust and accurate method to estimate population to meet research objectives, WWF and Fisheries Administration recruited a world leading researcher in river dolphin population monitoring, Dr Fernando Trujillo, to provide training in best methodology (**mark-recapture with photo-ID**) and supervise data collection and statistical analysis of first surveys conducted in April and May 2007. As result, a total search effort of 139 hours and 32 minutes was done between the 17th and 25th of April and 21st and 29th of May.

- Dolphins were observed and photographed for a total of 41 hrs and 01 minutes. A total of 4,383 photos were taken (2,036 on the April survey and 2,347 on the May survey). Of the 4,383 photos taken 2782 photos (63.5%) were selected for photo-ID based on good image quality.

- The MARK computer programme, utilising closed population models, was used to calculate the total estimated Mekong dolphin abundance based on the grouped data from all April and May surveys. Total abundance estimate of 71 dolphins for the Mekong River, as at end May 2007, with a range of between 66 to 86 dolphins at the 95% confidence interval.

National strategy plan and policy for conservation

- National Fisheries Law and Cambodian Mekong dolphin conservation strategy
  - Point No. 2 of article 23 of the Cambodian Fisheries Law states clearly that transporting, processing, buying, selling and stocking endangered fishery resources are prohibited.
  - In 2005, Fisheries Administration successfully developed the Cambodia Mekong Dolphin Conservation Strategy which is the conservational guidance for all who are interested in the conservation of freshwater dolphins in Cambodia
  - Royal Government of Cambodia has just issued the Sub-Decree on the list of Endangered Fishery Species consisted of 58 species (see annex)

1. <u>Data availability on marine mammal species</u>

- List of cetacean species in Cambodian Coastal Water
  1. Irrawaddy Dolphin *Orcaella brevirostris*
  2. Finless Porpoise *Neophocaena phocaenoides*
  3. Indo-Pacific Humpback Dolphin *Sousa chinensis*
  4. Bottlenose Dolphin *Tursiops truncatus*
  5. Pantropical Spotted Dolphin *Stenella attenuata*
  6. Dwarf Spinner Dolphin *Stenella longirostris*
  7. Long-beaked Common Dolphin *Delphinus capensis*
  8. Short-finned Pilot Whale *Globicephala macrorhynchus*
  9. False Killer Whale *Pseudorca crassidens*
  10. Bryde's Whale *Balaenoptera edeni*
  11. Dugong *Dugong dugon*

- List of dolphin observation hotspots
  1. The mouth of estuary of Piem Krosoap sanctuary (*Orcaella brevirostris, Sousa chinensis* and *Neophocaena phocaenoides*)
  2. Coral reef protected area around Koh Sdach islands (*Pseudorca crassidens*)

- Deceased cetacean appeared on the coastal areas or seashore
  - A large whale was discovered by fishermen in Koh Kong and then transferred to Sihanoukville in 1997. It is a probable Bryde's Whale (BEDE97-0/0) and its whole skeleton has been kept at marine fishery enforcement unit of DoF in Sihanouk Ville.
  - A Short-finned Pilot Whale (GMAC01-09/02) was stranded on the beach of Kep and then brought to Phnom Penh by DoF officials and died two days later.
  - One Dugong (DDUG02-27/02) was discovered in Kos Krorhorm village of Preak Smach district. It had been caught in a physical surrounding net at the sea area about 3 km from the village.
  - The skull of an Irrawaddy Dolphin (OBRE03-15/02) was discovered in Kdat fishing village. According to the fishermen, the carcass was found floating near the shore and then buried at the proper place. This skull was brought to DoF.
  - An Indo-Pacific Humpback Dolphin (SCH02-18/06) has been photographed as stranded from Tmor Sor fishing community in Koh Kong province; its skull was brought to DoF.

- An Indo-Pacific Humpback Dolphin (SCH03-27/02) was found as stranded on the beach of Kampenh in Sihanouk Ville. The carcass had disappeared because of big strong waves.
- The skeleton of an Indo-Pacific Humpback Dolphin (SCH01-0 /0) has been found and photographed after interviewing local fishermen in Koh Sdach district.
- A Finless Porpoise (NPHO02-12/03) was caught in Spanish mackerel nets of fishermen in Koh Kong province. Its meat was eaten and the whole skeleton was kept at Koh Kong provincial DoF.
- An Indo-Pacific Humpback Dolphin (SCH03-24/02) was found stranded on the beach of Kampenh in Sihanouk Ville. Its skull was brought to DOF.
- Six more Irrawaddy Dolphins (OBRE02-18/06) were killed in Ksach Krorhorm fishing village as local fishermen confused them with big fish. Some pieces of bone and skin were collected.
- A dead dolphin, probably Irrawaddy Dolphin, was found floating near the Marine Fishery Enforcement Station of Koh Kchong of Sihanoukville municipality. Its skull was brought to identify at DoF.
- The owner of one casino located at the ChamYiem Cambodian-Thai border hired villagers to catch Irrawaddy and Indo-Pacific Hump-backed dolphins and paid them with rice. Ministry of Agriculture, Forestry and Fisheries together with many local and international NGOs had complained. Finally some of those had been released back to the sea and only 4 have been kept at that casino.
- A dead Irrawaddy Dolphin (OBRE03-14/06) was floating and stranded on the beach of Koh Kape fishing village about 5 km from Peam Krosoap fishing community of Koh Kong province. It was dug up to take the skull and tissue samples for genetic, contaminant and life history studies.
- In 1993, local villagers using surrounding nets about 30m from the shore captured 11 Irrawaddy dolphins. Seven were released eventually, 4 were sold to Safari world in Thailand for about 6000 baht per apiece and 2 of those were sent to Japan and now there is one that still remains in Japan according to H.E. Tana.
- Three Irrawaddy dolphins (OBRE05-04/01), (OBRE05-08/02), (OBRE05-12/02) were entangled in gillnets and died. Local people had consumed the meat of two of these and the other one was buried in the village (see attached pictures of skin, flippers and skeleton).
- One pregnant Irrawaddy dolphin (OBRE04-28/12) was stranded on the beach of Koh Kape and died. It was buried.
- One Dugong (DDUG05- /07) was discovered in Kbal Rormeas village of Kampot province. It had been caught in a surrounding net. Its whole skeleton had been kept at Kampot provincial military-police unit.

3. <u>Conservation issues</u>

- 900 ha of sea grass are protected by local community in Kampot and other 1000 more ha are also protected local community at Chroy Prors of Koh Kong province.
- Coral reef around Koh Sdach islands are protected by local communities.
- The nine core zones of dolphin habitats are fully protected. One of them is protected by joint regulation between Cambodia and LaoTrans-boundary deep pool management committees.

- Amendment of the National Fisheries Law. The new law provides full protection to all fisheries threatened species.
- Development of Appropriate Management and Regulations regarding Dolphin-Watching Ecotourism at Kampi viewing site and Trans-boundary dolphin pool at Cheuteal.
- Establishment of Community Dolphin Committees.
- Initiation of Sustainable Development Solutions in Villages near nine Critical Dolphin Habitats.
- Enforcement of fisheries law
- Education and public awareness campaigns on marine mammals along the coastline (Between 2002 and the end of 2003) through awareness meetings in key fishing villages and schools in Koh Kong, Kampot provinces and Sihanoukville and Kep city.
- Marine mammal stranding programe along the whole coastline of Cambodia was established. Members of Marine Mammal stranding network were selected from provincial community fisheries, provincial and municipal fishery cantonments along the coastline of Cambodia. These people were trained on how to save marine mammals accidentally caught in fishing nets and stranded on the beaches. During the project period, twenty-seven dead and live-stranded marine mammals have been documented.

4. <u>Fisheries-cetacean interactions</u>

- Eleven species of marine mammals in Cambodia are listed in the list of fisheries threatened species through the Sub-Decree singed by Prime Minister
- The protection of nine core zones of dolphin habitats is the protection of fish stock for the sustainable uses of local communities along the Mekong River.
- Sea grass protected area in Kampot and Coral reef protected area around Koh Sdach islands in Koh Kong province is not only the important feeding and breeding habitats but also sources food (seagrass for Dugong) and preys for marine mammals
- Prohibition of the use of gill nets at the upper part of Mekong River in Cambodia causes the major impact to the way of living of local communities

5. <u>Recommendations</u>

- Further surveys concentrating on the inshore water along the whole coastline of Cambodia.
- More survey on Dugong concentrating at the sea grass areas of Kampot and Chroy Pras in Kong Kong as previous aerial survey was at the time of low tide and Dugong used to be caught in surrounding nets there.
- Mekong dolphin necropsy project needs more investigation in order to obtain better scientific information on the causes of death, particularly the calves.
- More strengthening on the Cambodia – Vietnam marine fisheries trans-boundary management committee and urgently need to establish Cambodian-Thai marine fisheries trans-boundary management committee.

Cetacean Research in Indonesia

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1. Introduction

Indonesia waters have an exceptionally high whale and dolphin diversity, inhabited about 29 cetaceans at which some of these species are rare and endangered. More than one third of cetaceans, known as whales and dolphins species can be found in Indonesian waters. Some research on cetaceans has been conducted by many institutes and subjects in Indonesia, namely:

• The Indonesian Oceanic Cetacean Program (IOCP) who have conducted research in three remote areas of Indonesia (Bunaken-Manado Tua Marine Park - Northern Sulawesi, the Sangihe-Talaud Archipelago and Komodo National Park and World Heritage Area) with an respective subject of the sperm whale (*Physeter macrocephalus*), cetacean monitoring program for the region's dive industry and other interest groups, and ocean conservation and an educational outreach program focusing on marine environmental issues

• Collaborative research program was established for the subject of whales and dolphins sea mammals focusing on a rapid ecological assessment of cetacean diversity, abundance and distribution in Komodo National Park by The Nature Conservation and APEX-environmental (April 2001), identification, distribution and behavior and abundance of cetaceans in Komodo National Park, Flores, East Nusa Tenggara (April 2003) and a rapid ecological assessment (REA) of oceanic cetaceans and associated habitats in the Bali-Lombok Strait Region (January-February 2005).

• In 2005, survey of oceanic cetacean and occasioned habitats in the Solor-Alor Strait region hereafter referred to as the Solor-Alor Straits Cetacean Survey-was carried out from traditional 23 m Indonesian wooden sailing vessel with long range live-aboard capacity.

• Joint Program WWF-TNC and Wakatobi National Park have been performing occasional observation to cetaceans in Wakatobi National Park areas, Southeast Sulawesi since 2006. The observation is a field activity (in the sea) complementing monitoring system (coral health, fish spawning and resources use monitoring).

• Since 2006, WWF-Indonesia has been doing some activities in Solor-Alor, East Nusa Tenggara in the way to encourage the establishment of sustainable Solor-Alor Conservation Area. Some of the activities are dealing with marine mammals or cetacean, they are: (a) Green campaign for school children particularly socialization about cetacean's habitat, (b). Local content (part of curriculum) arrangement especially for primary students in Lembata District which explains not only about the environment but also sea mammals that live in Solor-Alor areas, (c). Forming MSC (monitoring, controlling and surveillances) team by giving training to steak holders about how to monitor fisher activities and sea mammals (cetaceans) as the way to make management system run more effectively, and (d). Cooperating with some stakeholders to create and develop sustainable livelihood for Solor-Alor fishers on the way to reduce pressure toward endangered and protected marine source bad species. For instance developing sustainable tuna fisheries, etc.

• In 2007, WWF-Indonesia collaborated with Photo voice International to conduct the photo voice project; it is addressed to have better understanding on the traditional whaling in Lamalera, East Nusa Tenggara.

• In 2007, Conservation International (CI) and APEX Environment has been conducted The Raja Ampat Marine Mammal Assessment (MMA), it is the first comprehensive visual and acoustic survey of the marine mammals of the Bird's Head Seascape (BHS). The aim of the project is to increase the understanding and awareness on this species group in local waters, and to brief all major stakeholders of the major survey results and recommendations.

• River dolphins focusing on (1) conservation management of small core areas: key to survival of a critically endangered population of river Irrawaddy dolphins in Borneo (1999-2002), (2) Social dynamics of facultative Irrawady River dolphins (*Orcaella brevirostris*) in Borneo (1999-2002), (3) Cetacean diversity and habitat preference in tropical waters of East Kalimantan, Indonesia (2000-2003), (4) Abundance of fresh water Irrawaddy dolphins in the Mahakam River in East Kalimantan (1999-2002) and (5) impact of habitat on the acoustic of coastal and freshwater Irrawaddy dolphins, *Orcaella brevirostris* in East Kalimantan, Indonesia (2002). Those activities were done by RASI Foundation.

• Since 2004 until recently, Joint Program WWF-TNC and KKL Berau Cooperation Body have been conducting occasional observation to cetaceans in Berau Marine Protected Area (KKL Berau), East Kalimantan.

• RASI Foundation were conducted Marine mammal observation surveys in Balikpapan Bay in East Kalimantan in 2007 and 2008 in order to obtain information on cetacean diversity, total abundance, distribution pattern and threats.

• In 2009 the RASI (Rare Aquatic Species of Indonesia) was conducted species identification of cetacean in Berau island-East Kalimantan. A research activity of cetacean in Indonesia was commonly about species diversity, distribution, behavior, abundance and their habitat. So that no information regarding the research population size of cetacean was available. The national policy for cetacean is showed by implementing program of Indonesia Marine Protected Areas (MPAs) in the Sawu Sea was declared by President of Indonesia on May 2009, this area is the biggest MPA in Indonesia. He was committed that the large for the conservation area in the Sawu Sea in 2010 until 2020 is 20 millions hectares. The MPA in Sawu Sea is integrated management conservation model between economic, ecological, and social culture important. Besides, both the Government of Indonesia (the Ministry of Forestry, the Ministry of Fisheries and Marine Affairs, and the Ministry of Environment) and NGO's (APEX Environmental, WWF, Operation Wallace, Yayasan Konservasi Rasi, TNC) collaborate with Erich Hoyt in propose to executing the program of MPAs for whales and dolphins referring to the handbook's East Asian Seas section, including:

- The case study for the East Asian Seas region: Creating a place for cetaceans in Komodo National Park, Biosphere Reserve and World Heritage Area".
- A special-interest box on "MPAs and cetaceans in Indonesia"
- A summary of Indonesian laws relating to cetaceans and their habitats.
- Summaries (including several tables and charts) of cetacean species found and the ration able for implementing certain management measures. List areas include:
    a) Bunaken Marine National Park.
    b) Komodo National Park, Biosphere Reserve and World Heritage Area.
    c) Wakatobi Marine National Park.
    d) Semayang lake National Park (proposed habitat protection for the endangered Irrawady dolphin).
    e) e. Solor-Alor MPA (proposed, exceptional diversity of oceanic cetaceans, including sperm and blue whales, traditional hunting considerations).
    f) Northern and southern waters of Bali (currently non protected areas)
    g) Indonesia Marine Mammal Management Area or IM3A proposed for whale sanctuary in national and EEZ waters listing national whale watch development as a priority.

The Minister of Marine Affairs and Fisheries expressed interest to The Nature Conservancy-Indonesia Program in examining the possibility of establishing a marine mammal fisheries protection area in Indonesia's National and Economic Exclusion Zone (EEZ, 200 nautical mile limit) waters, where essentially all of Indonesia's marine mammals would be safeguarded against direct takes for non-traditional, commercial or scientific purposes. The Conservancy subsequently commissioned a small team led by our partner organization on cetacean research, APEX Environmental to prepare a "white paper analysis of policy option for this proposal. This policy document describes;

- The ecological and socio-economic context for marine mammal protection in the Pacific Ocean and what role Indonesia plays, and could play, in that context.
- The conservation goals as well as conservation benefits and related issues.
- Current whale protection policy and regulations in Indonesia and include a summary of jurisdictional responsibilities.
- The legal and implementation implications for an Indonesian Protected Marine Mammal Fisheries Area in all waters under Indonesian jurisdiction-national and EEZ.
- The Protected Marine Mammal Fisheries Area's international and national implications, its complementary role to the existing Indian Ocean Whale Sanctuary and the relevance of the Indonesia Marine Mammal Fisheries Protected Area's establishment to other Indonesian marine resource management and sustainable use programs. Besides, there is cetacean's research focusing on diversity, distribution, abundance and habitat characteristic that will be conducted by Research Institute for Marine Fisheries on 2010-2011 in the Sawu Sea. The WWF is conducting monitoring of cetacean in the Wakatobi and Berau islands as well as Alor and Solor islands in propose of growing awareness of local people for protecting cetacean habitat. Assessment of the sustainability of dolphin watching industries in Bali (northern and southern waters) by the James Cook University Australia. The project is conducted by Putu Liza Kusuma Mustika as her PhD project, aiming to investigates the four elements of sustainability, i.e. boat and dolphin interactions and dolphin ecology in general, stakeholders' social constructions of dolphin watching tourism (including tourists' perceptions and satisfaction level and input from dolphin operators), the economic benefits of the industries, and the management of the industries, and produce quadruple sustainable indicators based on the results. Temporary result will be presented to the stakeholders in Bali in early October 2009.

Project is expected to finish by the end of 2010.

2. Data availability species

There is a little information about a list of cetacean species in Indonesian waters because of no official conservation status (such as an endangered or vulnerable status). Actually, we don't even know precisely how many different species of whales and dolphins can only be filled by regional cetacean programs such as conducted by The Nature Conservancy and Apex Environmental. The visual and acoustic cetacean surveys in Komodo National Park have been conducted yearly twice in frequent since 1999 to assess the Park's importance for whale and dolphin species. Eighteen different species of whales and dolphins have been sighted to date, including the endangered blue white, roving orcas and the deep-diving Cuvier's beaked whale. Cetacean species identified based on some surveys in some locations in the Indonesian waters is listed in Table 1 - 5.

Table 1. List of all cetacean species in the Indonesian waters

Locations	Cetacean species	Status	References
Komodo National Park & adjacent waters for the 1999-2001	1. Long-nosed spinner dolphin (*S. longirostris*)	◙	TNC- APEX (2001) Total abundance : 7082 ind.
	2. Bottlenose dolphin *(T. truncates)*	▲	
	3. Pan-tropical spotted dolphin *(S. attenuata)*	▲	
	4. Melon-headed whale *(P. electra)*	●	
	5. Pygmy Bryde's whale *(B. edeni)*	●	
	6. Sperm whale *(P. macrocephalus)*	●	
	7. Fraser's dolphin *(L. hosei)*	●	
	8. Risso's dolphin *(G. griseus)*	●	
	9. Pygmy killer whale *(F. attenuate)*	○	
	10. Dwarf sperm whale *(Kogia simus)*	○	
	11. Pygmy/dwarf sperm whale *(Kogia sp.)*	○	
	12. False killer whale *(P. crassidens)*	○	
	13. Common dolphin *(Delphinus sp.)*	○	
	14. Rough-toothed dolphin *(S. bredanensis)*	○	
	15. Cuvier's beaked whale *(Z. cavirostris)*	○	
	16. Blue whale *(B. musculus)*	○	
	17. Orca *(O. orca)*	○	
	18. Short-finned pilot whale *(G. macrorhynchus)*	○	
	19. Indo-Pacific humpbacked dolphin *(S. chinensis)*	○	
Komodo National Park & adjacent waters in April 2003	1. Long-nosed spinner dolphin (*S. longirostris*)	◙	TNC (2004) *(1159 individuals sighting frequency)*
	2. Bottlenose dolphin (*T. truncates*)	▲	
	3. Pan-tropical spotted dolphin (*S.attenuata*)	▲	
	4. Sperm whale (*P. macrocephalus*)	●	
	5. Risso's dolphin (*G. griseus*)	●	
	6. False killer whale (*P. crassidens*)	●	
	7. Dwarf sperm whale (*Kogia simus*)	○	
Lamalera & Sawu sea in August & December 2004	*1.* Long-nosed spinner dolphin (*S. longirostris)*	◙	RCCF (2005) *(1930 individual sighting frequency)*
	*2.*Bottlenose dolphin (*T. truncatus)*	▲	
	*3.*Pan-tripical spotted dolphin (*S. attenuate)*	▲	
	4. Sperm whale (*P. macrocephalus)*	●	
	5. Pygmy killer whale (*F. attenuate)*	○	
	6. Short-finned pilot whale (*G. macrorhynchus)*	○	
	7. False killer whale (*P. crassidens*)	○	
	8. Fraser's dolphin (*L. hosei)*	○	
Bali-Lombok strait region In January 2005 and Lovina and southern waters of Bali (October 2007- April 2009)	1. Long-nosed spinner dolphin (*S. longirostris*)	◙	TNC-APEX (2005) *(2054 individual sighting frequency)* Total ind.acc.; 7.8337 Mustika personal observations
	2. Pan-tropical spotted dolphin (*S.attenuata*)	▲	
	3. Bottlenose dolphin (*T. truncatus)*	▲	
	4. Fraser's dolphin (*L. hosei)*	●	
	5. False killer whale (*P. crassidens*)	○	
	6. Short-finned pilot whale (*G. macrorhynchus)*	○	
	7. Pygmy killer whale (*F. attenuate)*	○	
	8. Bryde's whale (*B. brydel*)	○	
	9. Rough-toothed dolphin (*S. bredanensis)*	○	
	10. Southeast Asian (SEA) spinner dolphins (*Stenella longirostris roseiventris*)	▲	
	11. Risso's dolphins (*Grampus grisseus*)	●	
	12. Short-finned pilot whale (*Globicephala macrorhynchus*)	○	

◙ = Abundant; ▲= Common; ● = Uncommon; ○= Rare (Categories based on Kahn *et al*, 2000)

Table 2. Encounter rates of individual cetacean species by habitat type

Locations	Cetacean species	Sighting habitat	Number	Ref.
East Kalimantan waters in 2000-2003	*Tursiops truncatus*	offshore	6	RASI Found. (2004)
		island/reefs	6	
	Stenella attenuate	island/reefs	1	
	Stenella longirostris	offshore	2	
	Stenella longirostris, sp. (with short beak)	offshore	1	
		islands	2	
	Orcaella birostris	near shore	18	
		delta	5	
		island	67	
	Stenella l. reseiventris	near shore	1	
		offshore	3	
		Island	1	
	Tursiops sp.	near shore	4	
		island	1	
	Pseudorca crassidens	island	1	
	Peponocephala electra	island	1	
	Globicephala macrorhynchus	island	1	
	Tursiops aduncus	offshore	3	
	Neophocaena phocaenoides	near shore		
Northern and southern waters of Bali, October 2007-April 2009	SEA spinner dolphins (*Stenella longirostris roseiventris*)	North: inshore and offshore	(encounter rate of these species are not available due to different methods and research aims used)	
	Pan-tropical spotted dolphin (*Stenella.attenuata*)	South: offshore		
	Risso's dolphins (*Grampus grisseus*)	North: inshore and offshore South: offshore		
	Short-finned pilot whale *Globicephala macrorhynchus*)	North: inshore and offshore South: offshore North and south: offshore		
	Fraser's dolphin (*L. hosei)* *Pseudorca crassidens*	North: offshore South: offshore		

Table. 3. Species identified in Raja Ampat Islands – Papua (CII – APEX ENV., 2007)

Species identified	n
1. *Tursiops truncatus*	8
2. Stenella longirostris	7
3. Tursiop aduncus	6
4. Grampus griseus	3
5. Pheseter macrocephalus	2
6. Stenella attenuata	2
7. Pseudorca crassidens	1
8. Kogia sima	1
9. Blaenoptera brydei	1
10. Balaenoptera edeni	1
11. Small unidentified	4

Table 4. Species number of whale and dolphin sighting frequency during the observation in Kalimantan Region (WWF – TNC and KKL Berau Cooperation) in 2004-2008

Name of species	Scientific name	Number of species	Sighting frequency
1. False Killer Whale	*Pseudorca crassidens*	58	3
2. Melon – Headed Whale	*Peponocephala electra*	115	2
3. Fin Whale	*Balaenoptera spp*	2	1
4. Pilot Whale	*Globicephala melaena*	1	1
	Total	176	7
5. Spinner Dolphin	*Stenella longirostris*	2180	16
6. Common Bottlenose Dolphin	*Tursipos truncates*	863	14
7. Pantropical Spotted Dolphin	*Stenella attenuate*	300	5
8. Irrawady Dolphin	*Orcaella brevirostris*	69	5
	Total	3412	40

Table 5. Species number of whale and dolphin sighting frequency during the observation (July 2006 to March 2009) in Sulawesi Region (WWF – TNC and KKL Berau Cooperation)

Species	No.	Sighting frequency
Beaked whale	3	2
Blue whale	1	1
Bryde's whale	4	1
Melon head whale	840	12
Pilot whale	140	3
Sperm whale	39	12
Whale	16	12
Total	1043	43
Risso dolphin	5	1
Bottlenose dolphin	530	10
Spinner dolphin	1860	23
Dolphin	3255	60
Total	5650	94

There are several management priorities conducted by The Nature Conservancy and Apex Environmental:

1. Identify which species of whales and dolphins are abundant, common, uncommon, or rare in Komodo National Park and adjacent waters
2. Identify resident or transient population, and if the latter, record any seasonal sighting patterns in the Park.
3. Identify critical habitats for cetaceans of regional importance, such as preferred feeding and breeding habitats, as well as migration corridors.
4. Provide site and species-specific information on Komodo's cetaceans for:
    a. Marine resource and Park management purposes.
    b. Environmental awareness and educational programs.
    c. Support to the Park's marine tourism and dive industry.
5. Examine the major local and regional environmental impacts that threaten eastern Indonesia's whales and dolphins.

6. Evaluate which protective measures can be implemented by Park management authorities to minimize the environmental impact on cetacean habitats, including coral reefs, mangroves and the open ocean.
7. Involve local communities, dive operators, and tour guides to help monitor whale and dolphin activity in and around the Park.
8. Share the survey results with the Indonesian National Park Authorities, environmental organizations and local communities. These research activities aim to increase the protected management for the many rare and endangered whale and dolphin species in Indonesian waters. For example, as a direct result of the whale surveys in Komodo, extensions to the Park's boundaries and additional buffer zones have been adopted by the management authorities. These measures are also incorporated in the 25-year management plan in order to protect sensitive marine areas for Indonesia's whales and dolphins such as feeding and breeding grounds as well as migration corridors of regional significance.

3. <u>Conservation issues</u>

All cetacean and sirenian including in the CITES (Convention on International Trade of Endangered Species of Flora and Fauna). Since 1979 Indonesia has been ratified CITES, its mean that agree not commerce export and import all species of cetacean with its derivate products. Government Decree No. 7/1999 about pickling of wild animals and plants species, has protected all species of cetacean and sirenian, its mean that internal trade cannot be allowed. Government Decree No 8/1999 about wild animals and plants species exploitation said that it is permitted just only for traditional hunting, and limited trade, namely: "Barter". The complete whale protection has been existed by the decrees of SK. Mentan No. 327/Kpts/Um/5/1978, No. 716/Kpts/Um/10/1980 and the Governance regulation No. 60/2007 regarding preservation of wide flora and fauna, and conservation all of cetacean life in Indonesia. Besides, a whale Sanctuary declared in all seas under Indonesia's jurisdiction would complement the actions of other Indian Ocean nations that have taken the same course. The entire Indian Ocean from 55^{o}S has been established as the Indian Ocean Sanctuary (IOS) for whales. The whale sanctuary in Indonesia would be the piece that completes the IOS by safeguarding the Pacific Indian Ocean migration corridor.

The cetaceans are hunted by the people from the small villages in the east part of Indonesia. The activities allowed with marine mammals are only traditional hunting and ecotourism (Whale and dolphin watching). The traditional whaling is happening only in Lamalera, Lembata Island and Lamakera, Solor Island, Nusa Tenggara Timur, Eastern Indonesia. The appliances that used in traditional whaling are an appliance's stab, string and a boat without a machine; it is only used oars and sail. The boat is called "Paledang". The animal catches by people of Lamalera are Sperm whale, killer whales, small dolphins and small toothed whale, manta ray, sunfish, whale shark and whales, marlin fish. People Lamalera do not catch baleen whale. They are consuming the catch freshly or processing with drying. The catches by people of Lamakera are not so different with those of Lamalera. In Lamakera, toothed whales and dolphins (Odontoceti) are not captured, except cuvier's beak and baleen whale that comes into Shallow waters of Solor strait. After a few years, catch number of Sperm whale has decreasing significantly. The cause of happening is still unknown.

Cetacean watching industries in Indonesia have grown rapidly since the early 1990s, covering Bali and beyond (Raja Ampat, Alor, North Sulawesi, etc). However, the sustainability of this type of industry is not yet well researched. Research on Bali dolphin watching was just started in late 2007 and so far, there are indications that the dolphin watching industry in Lovina (north Bali) is not sustainably managed. More research and management interventions need to be done to ensure that the cetacean watching industries in Indonesia is sustainable. Indonesia also needs to adopt international law/regulation/consensus on sustainable cetacean watching practices.

4. Fisheries-Cetacean Interactions

Based on monitoring report about a rapid ecological assessment of cetacean diversity, abundance and distribution from TNC-APEX (2001), during observation in the Selat Sape and adjacent islands, the Pygmy Bryde's whales swam extremely close to the coastline of Gili Mota, Nose Kode or Rinca for the majority of observation time. This behavior increases the vulnerability of these whales to coastal fishing practices such as gill netting and reef blasting. It is noteworthy that bottlenose dolphins (*T. truncates*), spinner dolphins (*S. longirostris*) as well as numerous large mantas (*Manta birostris*) were also frequently observed in the same area.

The Rinca-Nose Kode passage in particular does warrant extra attention as a sensitive marine area for cetacean, and *B. edeni* in particular. Additional patrols to the area have been recommended to TNC-KFO and Komodo National Park Institute (KNP) in order to minimize any bombing activities or extensive gill net placements by the numerous fishing vessels in the passage. These measures would benefit all cetaceans inhabiting this part of KNP and can be integrated with reef conservation and sustainable fisheries programs.

In addition, the Indonesian section details various interactions between cetaceans and the East Asia Seas region's intense fisheries pressures, including coastal and river net entanglements, as well as destructive fisheries practices such as reef bombing. Gillnet and mesh netting were sighted frequently in the waters 1-5 mm south of Lembata especially. At least five 200-500 m nets were observed during 2.5 hours of survey route in this area. The risk of net entanglements in Solor-Alor is high for endangered and/or vulnerable species of large migratory marine file, which are relatively abundant in these waters – including blue whales, sperm whales and unidentified small baleen whales (data from interviews with local fishermen incase that these whales are likely to be (pygmy) Bryde's whales), leatherback and other sea turtle species, (whale) sharks and mola-mola (Kahn 2002b, c). Small cetacean may also be taken as targeted and/or by-catch in significant numbers throughout the Solor-Alor region. An assessment of cetacean-fisheries interaction is urgentlyneeded in Indonesia, and especially the Solor-Alor region (Kahn 2003b). There are increasing records of cetacean strandings in the Archipelago in recent decade (Mustika *et al*. 2009). Although there is uncertainty whether this phenomenon is caused by increased vigilante in stranding news (as opposed to the real escalation in the numbers of stranded marine mammals) and to what extent does drift nets and other unregulated fishing practices affect the stranding frequency, one thing is certain: Indonesia needs to have strong region-based stranding network and regular trainings on the management of stranded cetaceans. The main characteristics of Indonesia's marine fisheries include:

- Annual catch estimated in 1997 million tonnes
- Multi-species, multi-gear
- Some 94% of capture by small-scale fishermen
- Total fishing fleet currently estimated at 402,000 vessels (334,000 in 1988)
- 57% of fleet consists of non-powered boats, 55% of remainder use outboard engines.

The data needed for fishery management, including information on cetacean interaction, are either not publicly available or considered insufficiently reliable for stock assessment and estimation of sustainable harvesting levels. Since about 1990, there has been a very large increase in the number of Taiwanese longliners operating in the Indonesian EEZ (Economy Exclusive Zone) and in territorial/Nusantara (internal, archipelagic) waters of Indonesia. These boats catch Yellowfin and are though to compete with Indonesian coastal fishermen. Boats may be up to or in excess of 100 gross tones. The Indonesian longlines fishery is centered along the western coast of Sumatera, Java, Bali, and Nusa Tenggara. The main species targeted are Bigeye and Yellowfin. Some vessels use deep longlines gear to target Bigeye. As in other parts of the Indian Ocean, the area of operations for the Indonesian coastal longlines fleet is expanding. Moreover, Indonesian/Korean joint-venture vessels are becoming more widespread, operating in waters outside the Indonesian EEZ.

Given the insufficiency and poor quality of data from the Indonesian Tuna fisheries nationwide, information on the nature and extent of cetacean depredation is extremely limited. However, some reports from the 1970s note that such interaction was occurring frequently in Indonesian waters, especially high abundance of cetaceans in these waters, together with the intensive fishing effort for tuna, suggest that cetacean depredation may be significant. A comprehensive assessment is obviously needed to characterize and quantify the problem. Although data from Indonesia's fisheries are fragmentary and spare, the combined information from various Southeast Asian countries indicates that bycatch and targeted catch represent the primary threat to small cetacean populations, both coastal and oceanic, some of which have been drastically reduced.

The extent of the problem in Indonesia is hard to quantify in the absence of relevant fisheries data and of any direct observer programs for the large-scale fleets (considered the only reliable way to obtain quantitative data on bycatch). An assessment of cetacean bycatch in commercial fisheries within the Indonesian EEZ is urgently needed.

5. Recommendation on the future research work on Cetacean

• Additional field data (independent on-board observers in fisheries likely to experience significant cetacean interaction)
• Reporting of cetacean by-catch rates and cetacean stranding where a fishery interaction is likely to have been involved (i.e. net or line entanglements)
• Monitoring of fishing areas with high cetacean diversity/abundance (such as the Flores and Banda Sea)
• Ecological research on cetacean species known or suspected to be involved in depredation.
• Improved management for cetaceans inhabiting the Bali-Lombok Strait region. This area has a relatively high cetacean diversity and abundance when compared to most other areas in eastern Indonesia. In addition, the waters to the south off Bali have been established as one of Indonesia's prime cetacean habitats where whale and dolphin watching is possible on a daily and year-round basis.
• Lovina areas (north Bali) can serve as a good example of how community-based dolphin watching industry can strive for sustainable practices through extensive research, good and regular communications, government assistance, and practical best practice trainings.
• Research an assessment of cetacean – fisheries interaction in Solor-Alor, Kalimanatan, Sulawesi, East Nusa Tengga, Bali and Papua regions.
• Research an assessment population size of cetacean.
• Monitoring regularly of cetacean habitat related with the global exchanges issues.
• Future survey effort should focus particularly on the Berau Archipelago and involve investigating at which areas have a year-round or seasonal importance for all target species and relating this to ecological and bio-geographical factors.
• Cause of habitat degradation of Irrawaddy dolphins (Mahakam fresh water dolphins), so need the research of habitat quality monitoring and fisheries interaction.

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Annex 9

Conservation and Management of Endangered Species: Marine Mammals in Malaysia

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Conservation and Management of Endangered Species: Marine Mammals


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1

INTRODUCTION

CONSERVATION

" The management of human use of organisms or ecosystem to ensure such use is sustainable"

"Conservation includes protection, maintenance, rehabilitation, restoration, and enhancement of populations and ecosystems"

ENDANGERED SPECIES

"Any plant or animal species whose ability to survive and reproduce has been jeorpadized by human activities"

Or

"A species whose population is so small that it is in danger of becoming extinct"

2

INTRODUCTION

- Species may become endangered due overexploitation, habitat alteration and destruction, and overpopulation by alien species and other factors
- Presently the Fisheries Regulation on the Control of Endangered Species of Fish 1999 under the Fisheries ACT 1985, protect the following marine species,- Dugong, six species of whales, thirteen species of dolphins, one species of whale shark, five reptiles (turtles and painted terrapin) and four species of giant clams

3

Legal Status and Management Arrangement

- All marine mammals in Malaysia are endangered or vulnerable
- The status of marine mammals in Malaysia is not adequately documented.
- There are 19 species of cetacean (dolphins & whales) and one species of sirenian group (Dugong) have been confirmed either to reside in or transit Malaysian territorial and Exclusive Economic Zone (EEZ) waters from a total of 120 species recorded in world.
- They are totally protected in Malaysia water and Federal laws apply within 200-nautical mile Exclusive Economic Zone (EEZ)
- Wildlife protection Act 1972
- Fisheries Act 1985
- Fisheries Regulation 1999 (Control of Endangered Species of Fish)
- Wildlife Protection Ordinance 1998 (Sarawak)
- Wildlife Conservation Enactment 1997 (Sabah)

4

FISHERIES ACT 1985
27. Aquatic mammals or turtles in Malaysia fisheries waters.

- **(1) No person shall fish for, disturb, harass, catch or take any aquatic mammals or turtle which is found beyond the jurisdiction of any State in Malaysia.**
- **(2) The provision of the relevant State law shall apply in respect of aquatic mammals and turtle which are found within such jurisdiction.**
- **(3) Where any aquatic mammals or turtle which is found beyond such jurisdiction is caught or taken unavoidably during fishing, such aquatic mammals or turtle shall, if it alive, be released immediately or, if it is dead, the catching or thereof shall be reported to a fisheries officer and the aquatic mammals or turtle shall be disposed of in accordance with his direction.**

5

- **(4) Any person who contravenes subsection (1) or subsection (3) shall be guilty of an offence and shall be liable to fine not exceeding five thousand ringgit.**

FISHERIES (CONTROL OF ENDANGERED SPECIES OF FISH) REGULATION 1999

Prohibition

(1) no person shall fish for, disturb, catch, kill, take, possess, sell, buy, export or transport any endangered species of fish specified in the Schedule except with the written permission of the Director General.

- (2) The Director General may, in granting written permission referred to in subregulation (1), impose any condition as he think fit.
- (3) Where any endangered species of fish specified in the Schedule is caught or taken unavoidably during fishing, such endangered species of fish shall, if it alive, be released immediately or, if it dead, the catching or taking thereof shall be reported to a fisheries officer and the endangered species of fish shall be disposed of in accordance with his directions.
- Offence

Any person who contravenes subregulation 2(1) or any of the condition imposed by the Director General under subregulation 2(2) commits an offence.

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Endangered Species

Whale Group

Balaenoptera edeni
Balaenoptera borealis
Balaenoptera musculus
Balaenoptera physalus
Balaenoptera acutorostrata
Megaptera novaeangliae

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Endangered Species

Dolphin Group

Orcaella brevirostris
Sousa chinensis
Orcinus Orca
Tursiops truncatus
Lagenodelphis hosei
Stenella longirostris
Globicephala macrorhynchus

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Endangered Species

Grampus griseus
Kogia breviceps
Neophocaena phocanoides
Delphinus delphis
Pseudorca crassidens
Physeter catodon

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Endangered Species

Dugong Group

Dugong dugon

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Information on Marine Mammals Status

Research scope based on:

- Death/stranding
- There have been numerous cases of marine mammals stranding and recorded over the years in Malaysia.
- Sighting
- Questionnaire survey

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Dugong Distribution and Abundance

- Dugong are reported to have been seen occasionally in certain areas of Malaysian waters.
- Known only from incidental sighting, accidental catches, and the sighting reports of fishermen.
- Aerial surveys have resulted in a more comprehensive knowledge of dugong distributions in coastal waters of East Malaysia and nothern Penisular Malaysia.
- Interview survey done by Saifullah et al. in 1999 and 2000 along the coast of Sarawak indicated that small population of dugongs might still inhabit shallow waters of Lawas and Limbang, the decline was primarily due to decrease in seagrass abundance in the respective sites
- Aerial survey on 27 April 2001 by the Borneo Marine Research Institute reported 14 dugong sightings in the shallow waters of Brunei Bay
- Sighting and interview surveys conducted by the Malaysian Marine Mammals and Whale Shark Working Group in March 1997 reported dugong occurrences in Labuk located at the eastern coast of Sabah. This is supported by the seagrass beds found scattered in the Kaniogan area (Jaaman et al. 2000)

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Dugong Distribution and Abundance

- The Borneo Marine Research Institute have also conducted aerial surveys in Sabah in May 2000 and reported dugong sightings in the shallow waters of Labuan and Kudat, both are on the western coast of Sabah

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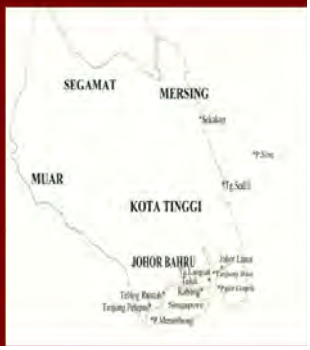
Dugong Distribution and Abundance

- From 1994, and up to this day, Johor is the only state in Malaysia that records dugong stranding cases and has initiated the national dugong conservation efforts. Johor is also believed to have the largest dugong habitat in Malaysia
- Three dugongs were sighted off Pasir Putih from an aerial survey done on 25 March 1999
- Aerial survey done by Department of Fisheries Malaysia in May 1999 reports of 20 dugongs in the eastern coast of Johor.
- The dugong sighting sites were Pulau Sibu, Pulau Tinggi, Pulau Besar, Pulau Tengah, Pulau Hujung and Pulau Rawa, where the areas from Pulau Hujung to Pulau Rawa is known to have a large stretch of seagrass bed in Peninsular Malaysia

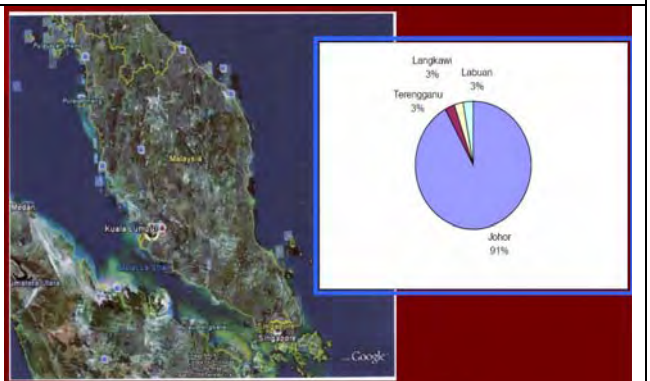


16

Historical data of Dugong Stranding

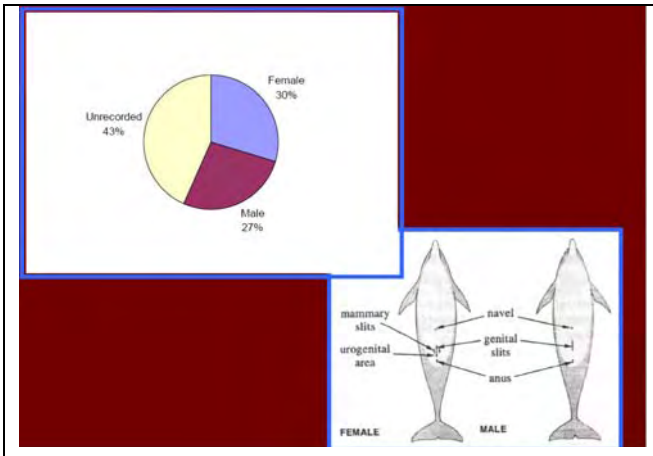
There were 36 dugong reported stranded/death from 1994 to 2008
G:\Thailand\Table 1.doc

17



91% stranded/death record in Johor (along Straits of Johor and District of Mersing.

18



19

DUGONG CARCASS

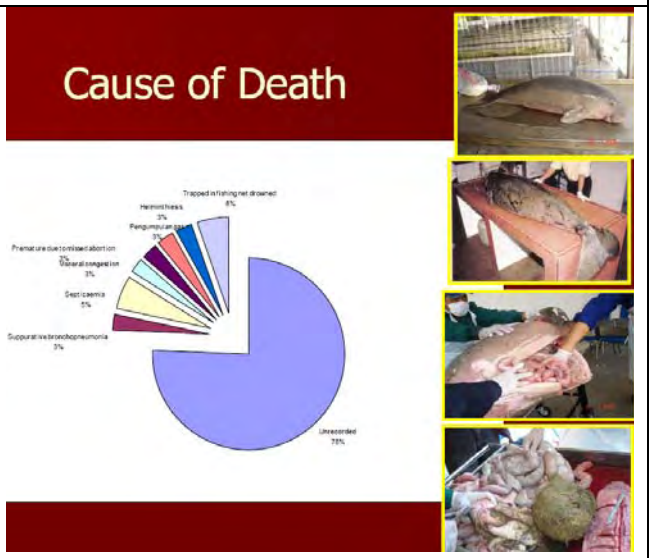
20

Cause of Death

- The cause of death in dugongs is very difficult to determine especially in the tropics as dugong decomposes quickly
- Most of the carcasses found were badly decomposed to determine the cause of deaths of these dugongs, thus postmortems done on these carcasses reveal no significant finding except for one calf carcass which died on 10 March, 1999 which was diagnosed with suppurative bronchopneumonia.
- Another dugong died of septicemia, one died of visceral congestion due to physical trauma, one fetus dies of missed abortion, and two dugongs drowned from entanglement in fishing nets.
- Heavy metals testing were also done on these carcasses, which also reveal no significant findings

21

Cause of Death



22

Record of Dolphin Deaths in Malaysian Waters

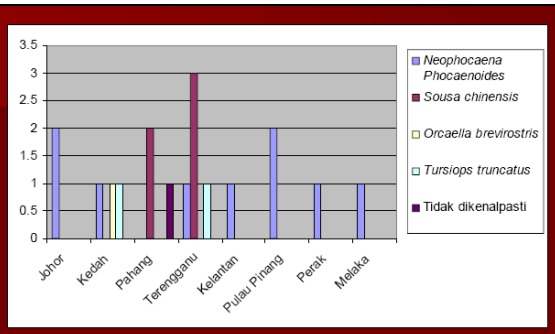
Year	Number	Species	Site
2004	3	*a) Neophocaena phocaenoides (2 ekor)* (Lumba-lumba Porpoise Ambu) *b) Sousa chinensis* (Lumba-lumba putih)	- Muar, Johor - Langkawi, Kedah - Cherating, Pahang
2005	3	a) *Tursiops truncatus* (Lumba-lumba Bottlenose) b) *Lumba-lumba* c) *Sousa chinensis* (Lumba-lumba putih)	- Kemaman, Terengganu - Cherating, Pahang - Ma' Daerah, Terengganu
2006	8	*a) Neophocaena phocaenoides (5 ekor)* (Lumba-lumba Porpoise Ambu) b) *Sousa chinensis* (Lumba-lumba putih) (2 ekor) c) *Tursiops truncatus* (Lumba-lumba Bottlenose)	- Sekakap Mersing Johor - Tok Bali, Kelantan - Pulau Pinang - Marang, Terengganu - Pulau Pangkor, Perak - Cherating, Pahang - Kerteh, Terengganu - Kuala Ibai, Terengganu
2007	1	a) *Sousa chinensis* (Lumba-lumba putih)	- Kerteh, Terengganu
2008	4	*a) Neophocaena phocaenoides* (Lumba-lumba Porpoise Ambu)-(2 ekor) b) *Orcaella brevirostris* (Lumba-lumba Empesut) c) *Tursiops truncatus*	- Pulau Pinang - Melaka - Yan, Kedah - Padang Kota lama, Kedah

23

Cause of Death

- Entangled in the fishing gear – especially drift net
- Boat propelar

24



Finless porpoise *Neophocaena phocaenoides* mostly reported stranded, followed by Indo-pacific humpback dolphin *Sousa chinensis*.

25

DOLPHIN CARCASS

Sousa chinesis

Neophocaene phocaenoides

Sousa chinesis

Tursiops truncatus

26

Record of Whale Deaths/Stranding in Malaysia Waters

Year	Number	Species	Site
2005	1	*Balaenoptera borealis*	Pulau Carey, Selangor
2006	1	*Balaenoptera edeni*	Pulau Gaya, Sabah
2008	2	*a) Balaenoptera edeni* *b) Balaenoptera edeni*	Cherating Pahang Pekan, Pahang

27

Whale Carcass

Pulau Carey *(Balaenoptera borealis)*

Nenasi, Pekan *(Balaenoptera edeni)*

28

Batu Buruk Whale

- Pygmy spermwhale - *Kogia breviceps*
- 20 Januari 2009
- 8.30 pm
- Cause of Death: Helminthiasis

29

Cause of Death: Whale

Digestion tract clogged by plastic bag, rope and bottle cap

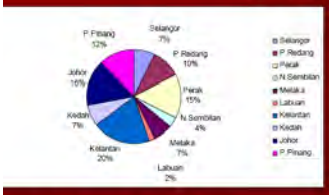
30

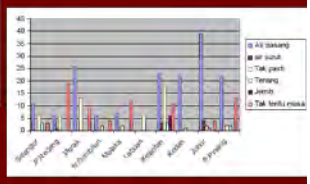
Questionnaire Survey of Dugong

Majority of respondents states that the main habitat of dugong is by the coastlines as dugong were always sighted swimming by the area. However, 50% states that the seagrass beds are the main dugong habitat, and related the areas as the feeding area of dugong

31

Questionnaire Survey of Dolphin

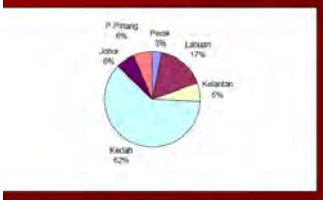


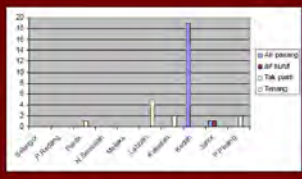


Out of 380 respondent, Only 318 respondent incidentally sighted dolphin at all location while fishing. Dolphin can be seen during high tide every month at the area near island

32

Questionnaire Survey of Whale





Out of 380 respondent, only 31 respondent sighted whale at all location while fishing. 69% respondent stated that whale ca be seen during September to December especially at the high tide.

33

SIGHTING INFORMATION

- Irrawady dolphin
- 3 pair
- On 26 Oktober 2006
- 10.00 am
- Sea condition : calm
- Area : estuary, Kuala Lawas, Sarawak
- Activity : making a circle movement

34

SIGHTING INFORMATION

- Bottlenose dolphin
- 2 pairs
- On 20 Oktober 2008
- Redang Island, Terengganu
- 12.00 pm
- Sea condition: calm
- Activity: Following boat

35

SIGHTING INFORMATION

- Irrawaddy dolphin
- A pair
- 12 Julai 2009,
- Penyabung Mersing, Johor
- 6.00pm
- Sea condition: calm
- Area: Estuary
- Activity : making a circle

36

Threats

- Dugongs and small cetaceans are facing threats from by-catches in fisheries (fishing gear), declining fisheries resources, pollution, habitat loss and degradation of aquatic habitats(particularly of mangrove forest, coral reefs and seagrass bed), heavy vessel traffic and rapid urban and industrial development along Malaysian coastline.
- In Sabah, traditional hunting for meat, illegal trawling in near-shore, estuarine and riverine waters, and dynamite fishing are particularly detrimental to the species and may be reduced their significantly

37

Management

Rescue Center

1. Gelang Patah, Johor
2. Pengerang, Johor

Proposed

1. Rantau Abang, Terengganu
2. Manjung, Perak

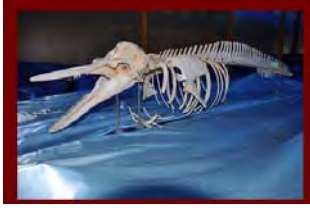
38

Management

Public Education/Awareness

1. Establishment of 1 gallery
2. Joint efforts with various government agencies, NGOs and private companies
3. Volunteer programmed for the members of public
4. Exhibition road-show

39



40

Conservation Action

1. Study the status of marine mammals management in Malaysia
2. Identify hotspots for marine mammals distribution based on records of sightings and stranding reports.
3. Develop specific management plans for conservation
4. Recommend marine protected area for marine mammals based on updated information on species composition and distribution, create public awareness campaigns and other education tools
5. Initiate ecotourism marketing campaigns and
6. International coordination on management issues

41

Record of Dugong Deaths in Malaysian Waters

Report	Date	No.	Sex	Site
1	1994	2	Female cow and calf	Pulau Sibu, Mersing
2	1995	5	Unrecorded	Sekakap, Mersing
3	1996	1	Unrecorded	Pulau Sibu
4	1998	1	Unrecorded	Tg. Sedili, Mersing
5	10 Mar 1999	1	Male calf	Pasir Putih, Johor Bahru
6	14 Mar 1999	1	Female cow	Selat Tebrau
7	18 Mar 1999	1	Male cow	Selat Tebrau
8	23 Mar 1999	1	Male calf	Pasir Gogok, Kota Tinggi
9	18 May 1999	1	Male cow	Kg. Jawa, Pengerang
10	1 Jun 1999	1	Male calf	Tg. Langsat
11	23 Jun 1999	1	Female cow	Pasir Gogok, Kota Tinggi
12	14 Jul 1999	1	Male cow	Tg. Pelepas, Gelang Patah
13	16 Aug 1999	1	Female cow	Kg. Johor Lama, Kota Tinggi
14	28 Aug 1999	1	Male calf	Tebing Runtuh, Gelang Patah
15	1 Oct 1999	1	Male cow	Tg. Langsat, Johor Bahru
16	5 May 2001	1	Calf	Kg. Pasir Putih, Johor Bahru
17	4 Jul 2001	1	Cow	Teluk Kabung
18	30 Oct 2001	1	Female cow	Tg. Buai, Kota Tinggi
19	31 Oct 2001	1	Male fetus	Tg. Buai, Kota Tinggi
20	14 May 2003	1	Cow	Tg. Pelepas, Johor Bahru
21	23 Jul 2003	1	Female cow	Pulau Merambong, Johor Bahru
22	18 Oct 2004	1	Unrecorded	Pulau Merambong, Johor Bahru
23	14 Jan 2006	1	Unrecorded	TLDM Pengerang, Kota Tinggi
24	11 Apr 2006	1	Unrecorded	Simpang. Arang, Gelang Patah, Johor Bahru
25	28 Jul 2006	1	Female	Pengkalan Pendas Laut, Johor Bahru
26	11 Sept 2007	1	Male	Sungai Pendas, Johor Bahru
27	16 Feb 2008	1		Tanjung Langsat, Johor Bahru

Annex 10

Cetacean Research in the Union of Myanmar

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1. Introduction

Myanmar is significant country which belong the Bay of Bengal and Andaman Sea. The Length of the coast line starts from the mouth of Naaf River to Kawthaung (Victoria point) it's approximately (2832 kilometers). The area of the continental shelf from coast line is (228, 781 sq kilometers). Myanmar is the only country in the Bay of Bengal which belong Mergui Archipelago; it is composed more than 800 islands, situated at Taninthayi Coastal area, many of marine creatures feeding, spawning and migrates inside the Archipelago.

A little is known about the status of cetaceans in the coastal waters of Myanmar. However, anecdotal evidence suggests that mortality rate from fisheries bycatch and deliberate catch is increasing. The paucity of information on the occurrence, distribution and abundance of cetaceans, and the extent and magnitude of factors that threaten their survival make it impossible to advocate conservation measures that balance their survival needs with those of growing local human populations and increasing development.

The Department of Fisheries collaborate with Wildlife Conservation Society (WCS) for the purposed of research and conservation of the endangered aquatic animal of Myanmar waters. During November, December 2002, the first scientifically a visual boat-based survey conducted the entire range of Ayeyarwady River for the population of Ayeyarwady Dolphin. Survey started at the Maykha and Maylikha, the confluence of the entire Ayeyarwady River system to delta area, which end the Gayet Kyi Island at the river mouth of Ayeyarwady River. It's covered 1,787.5 km of track line in the main channel and 201.5 km in the side channels. Eight groups of dolphin in the main channel for a total best estimate of 37 individual, including calves. Second and third survey conducted the same month of 2003 and 2004 for the segment between Mandalay and Bhamo which dolphin group were sighted from the first survey, the survey team sighted upstream and downstream and estimate the individual of 59 for 2003 and 72 for 2004. The Protected area for the Ayeyarwady Dolphin was established on the 28th December 2005.

The preliminary questionnaire survey for the present of seacow (*Dugong dugon*) at the Rakhine Coastal area, especially fisher and fishing village at Thandwe (Sandoway) and Gwa Township was conducted on the December 2005. Historically evidence recorded that, dugongs were first reported off the western coast of Myanmar in 1853 (Mason 1882). Since then periodic dugong sightings, stranding, and incidents of dugongs being caught in fishing nets have been reported, mostly in the Rakhine area. Dugong is still occurring at the Rakhine Coastal Area.

In April 1996, a team conducted boat based visual surveys for coastal cetaceans along the Rakhine Coastal area, especially Sittwe, Kyaukpyu and Thandwe coastal area. Total 566.6 km (57.7 hours) of search effort conducted in coastal/bay/inlet habitat along the Rakhine Coastal area. A team recorded 18 sightings of cetaceans: 38 bottlenose dolphin (*Tursiops truncates*, aduncus-type)

,19 Ayeyarwady (Irrawaddy) dolphin (*Orcaella brevirostris*), 361 spinner dolphin (*Stenella longirostris*) and 1 Bryde's Whale, the team also examined two dried skins that identified as spinner dolphin and

indo-pacific hump-back dolphin. Total population number of cetacean was 419, along the Rakhine Coastal Area. (Fig 1)

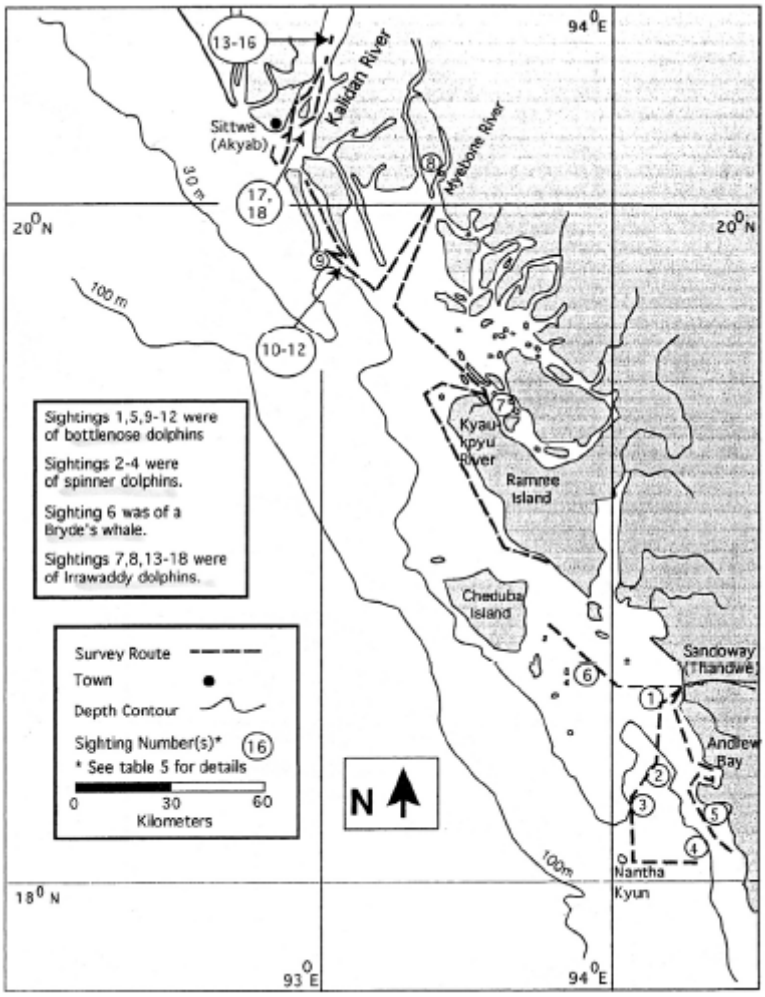

Figure 1 Cetacean Survey at Rakhine Coastal Area (1996)

A vessel-based line-transect survey for cetaceans was conducted during 23rd February- 6th March 2005 with international scientist team from Myanmar, Bangladesh, Sri Lanka, India, Thailand and United State of America, in the coastal waters of Myeik Archipelago of Southern Myanmar. (Fig. 2)

A total of 30 cetacean groups were detected while on effort, the estimated population size of the animal groups were (1) 225 Indo-Pacific bottlenose dolphin (*Tursiops truncates*), (2) 37 Indo-Pacific humpback dolphin (*Sausa chinensis*), (3) Pantropical spotted dolphin (*Stenella attenuata*), (4) 12 Irrawaddy dolphin (*Orcaella brevirostris*), (5) 6 Finless porpoises (*Neophocaena phocaenoides*), (6) 3 Bryde's whales (*Balaenoptera edeni*) , (7) 495 Long-snouted Spinner dolphin (*Stenella longirostris*) (8) 1 unidentified baleen whale , and (9) 10 unidentified Delphinid, in this cruise total population number of cetacean was 789, inside the Myeik Archipelago. (Fig. 3)

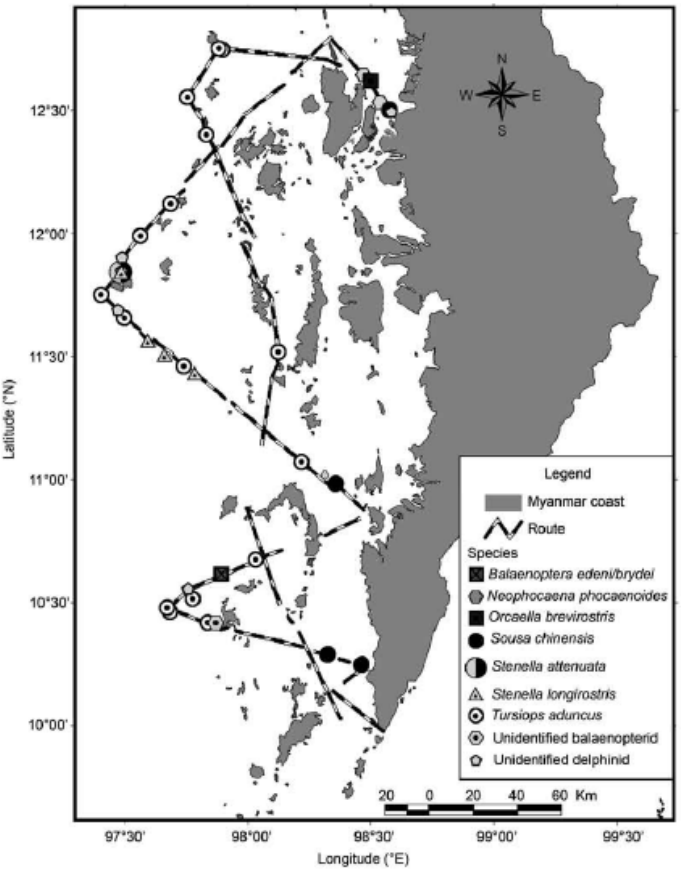

Figure 2 Mergui Archipelago Cetacean Survey Map (Feb-Mar, 2005),Ship route and Sighting

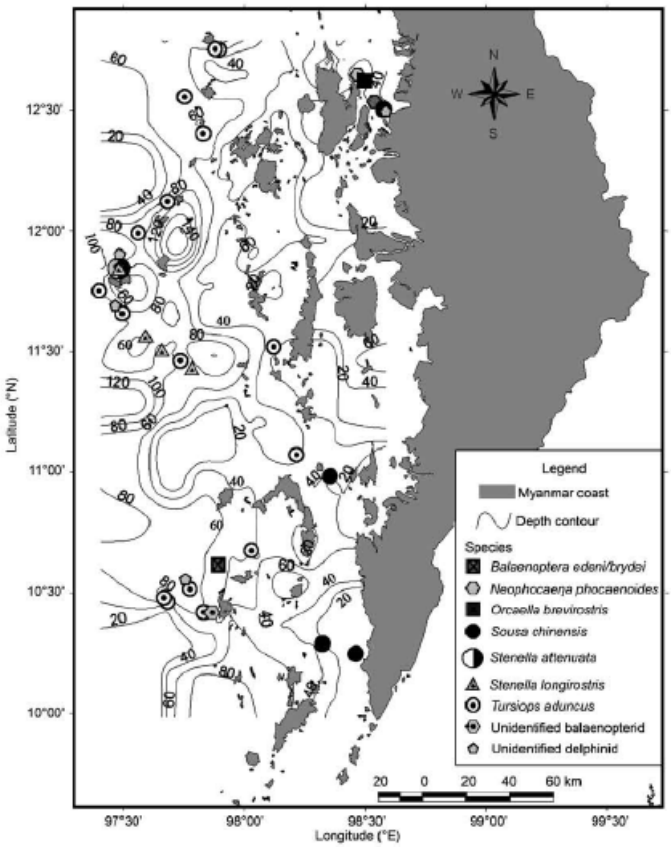

Figure 3 Mergui Archipelago Cetacean Survey Map (Feb-Mar, 2005), Depth wise and Sighting

Investigation of Dugong and seagrass bed survey at the Mergui Archipelago was conducted the Scientist from Department of Fisheries, Myanmar, collaboration with and international scientists on the 2006 Dec to 2007 Jan. (Fig. 4)

Figure 4 Myeik Archipelago Dugong Survey Track, Position and Marine Mammal Species Sighting Position

2. Data availability > Species

Many cetaceans' species are abundance and sighted at Myanmar coastal area and deep sea; sometime fishing vessels carried the big whale carcass and display at the Natural History museum for people educational purpose. Since 1966, only one alive female dugong captured by the fishing gear at Rakhine Coastal area was carried and retained at Yangon Zoological Garden. Every year many cetaceans stranding along the coastal areas, shores, and islands, local people and fishermen reported to the authority, some were identified and displayed at State and division Colleges and Universities.

For the conservation purposes, the Department of Fisheries ordered all fishers to be avoided these species when fishing, and not allowed to capture and sold the whole and any parts in Myanmar. Department of fisheries staffs frequently inspect all local fishing boats, fishing gears and bycatch species, for the purposes of conservation and people awareness program. It has a plan, to conduct the scientifically survey of cetacean at Myanmar coastal water, to be collaborate with International scientist and Organization.

The following list is identified and recorded cetacean species at Myanmar Coastal Waters.

1. Blue whale, *Balaenoptera masculus*
2. Fin Whale, *Balaenoptera physalus*
3. Bryde's whale, *Balaenoptera edeni*
4. Sperm whale, *Physeter macrocephalus*
5. Pygmy killer whale, *Feresa atteneuta*
6. Longman's Beaked whale, *Indopacetus pacificus*
7. Ayeyarwady (Irrawaddy) dolphin, *Orcaella brevirostris*
8. Indo-pacific Bottle-nose Dolphin, *Tursiops aduncus,truncatus*
9. Indo-Pacific humpback dolphin, *Sausa chinensis*
10. Pantropical spotted dolphin, *Stenella attenuata*
11. Finless porpoises *Neophocaena phocaenoides*
12. Long-snouted Spinner dolphin, *Stenella longirostris*

3. Stranding rare Whale species

During 2005 July, one of the rare whale species, Long-man Beaked Whale (*Indopacetus pacificus*) stranding at Yangon District, Kyauk Tan township Bawa Thit agriculture farm near Yangon river mouth. The picture was recorded and published at the Marine mammal of The World (new addition, 2008)

4. Conservation issue

Union of Myanmar, State Law and Order Restoration Council enacted The State Law and Order Restoration Council Law No. 6/94, titled " the Protection of Wildlife and Protected area Law" on 8th June 1994. The objectives of the Law are as follow:

- A) to implement the policy of protecting wildlife of the state.
- B) to implement the policy of conserving the protected of the state.

- C) to carry out in accordance with International Conservations agreed by the State in respect of the protection of wild species of both flora and fauna and representative ecosystems occurring in the country.
- D) to protect endangered species of wild flora and fauna and the habitat.
- E) to contribute for the development of research and natural resources.
- In accordance with Chapter V, Article 15 (a) of the protection of Wildlife and Protected Area Law, the forest Department of the Ministry of Forestry, Union of Myanmar issued Notification No. 583/94, dated 26 October 1994 under which, the Cetaceans was listed in the "Completely Protected Animals" category. Therefore, since 1994 the Cetaceans are totally protected by law in Myanmar.
- F) to established zoological and botanical gardens for the protection of flora and fauna.

The Department of Fisheries collaborates and signed MoU agreement with the Wildlife Conservation Society (WCS) for the purpose of research and conservation of Ayeyarwady Dolphin and cooperative fisherman.

At 2005, Dec, 28th, the Department of Fisheries established the protected area for Ayeyarwady (Irrawaddy) dolphin population at the upper reach of the Ayeyarwady River (72 kilometer) segment between Mingun and Kyauk Myaung (Sagaing Division).

5. Fisheries-cetacean Interactions

In Myanmar, some fishing operation disturb, harass, injure, or kill marine mammals, either accidently deliberately. Mostly accidentally caught in gill net which set on the seagrass bed, dugong species were killed by these fishing gears at Rakhine and Tanintharyi Coastal areas. Dolphins and Whales species were caught by gill-net at Tanintharyi Coastal water, sometime they were caught by the bottom Trawlers.

The Ayeyarwady Dolphin was accidentally killed by gill-net in Ayeyarwady River, and Delta area (river mouth of Ayeyarwady River). Some fisher at Rakhine Coastal area reported that, the Dugong are very strong and can damage the gill-net easily, sometime they are angry and broke his boat rudder.

The Department of Fisheries prohibited, for fishing and hunting of marine mammals and sells the whole or parts in Myanmar.

6. Cooperative Fishing

Ayeyarwady (Irrawaddy) River is one of the biggest rivers in Southeast Asia, and it's the most dominant feature in Myanmar (Burma). This arises from Northern hill streams and through steep gorges upstream of Bhamo, and then flow the entire length of the country, for approximately 2,200 km, before the reaches of the Andaman Sea.

The 19th century naturalist John Anderson described Ayeyarwady (Irrawaddy) dolphins in the Ayeyarwady River as morphologically distinct from *Orcaella brivirostris* .

Cooperative fishing between Ayeyarwady dolphin and fishermen is a kind of traditional fishing practice since long time ago; and it's never been described in the world fisheries records.

The fishermen said they could catch more fish when fishing with the dolphins then without dolphins. Sometime they could catch up to 40 to 80 kilo, a fishermen also told that they could live well almost a month without doing anything if they could get such a good catch.

Cooperative fishing is a mutually benefit technique for both fishermen and dolphins. It has been maintained and passed down culturally in both human and dolphin since very long time ago. The Department of Fisheries, DoF (Myanmar) protected and conserved the Ayeyarwady dolphin between Mingun and Kyaukmyaung, 72 kilometers segment of Ayeyarwady River.

7. Recommendation on future research work on Cetacean

Myanmar is one of the most pristine coastlines and largest rivers in Asia, Myanmar is in an ideal position to take the lead among nations of the region in the wise stewardship of marine and fluvial resources. These preliminary studies of cetaceans in Myanmar will encourage more extensive research throughout the Ayeyarwady River and the entire coast of the country. Technical assistance for implementing cetacean research programs is available through the IUCN Species Survival Commission, Cetacean Specialist Group, Ocean Park Conservation Foundation, and the Asian River Dolphin Committee.

The recommendation for the further studies should be conduct on the occurrence and distribution of cetaceans along the coastal area of Myanmar. Particular emphasis should be given to investigating the extent of incidental takes of dolphins in fishing nets and assessing the effects of offshore exploration and drilling for oil and natural gas.

The following recommendation should be conduct for the purpose of the conservation.

1. To conserve and protect the endangered cetacean species along the coastal area of Myanmar.
2. To conduct scientifically survey for the distribution and abundance of coastal area of Myanmar.
3. To promote collaboration workshop and collaboration survey with other international scientists, organizations, and institutions, who conserve survey, research and conservation of endangered cetacean species.
4. To educate the local fishermen, the fisheries officer who stationed along the coastal area, the knowledge of cetaceans, regional and internationally prohibited for killing, hunting and selling.
5. To prohibit the fishing grounds and fishing gears and techniques, to conserve the cetacean species which habitat along the coastal area of Myanmar.
6. To propose research grant and funding from international organizations, institutions and NGOs for the purpose of the conservation survey and management of cetaceans, along the coastal area of Myanmar.
7. To be establishing research station to collect the baseline information along the coastal area of Myanmar.

Annex 11

Status and Management of Cetaceans in the Philippines

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Abstract

Twenty seven species of cetaceans have been confirmed in Philippine waters all of which are protected under Philippine laws. Directed takes, by-catch and stranding of the animals have been recorded and reported. Such information has been used for identifying cetacean hotspots for conservation and management purposes. Possible future activities for research have been enumerated.

1. Introduction

There are 27 spp. of cetaceans confirmed to occur in Philippine waters thus far, all of which are protected by existing Philippine laws. This listing however could change easily as the rate of confirmation of new aquatic species in the Philippines is relatively high.

Available information from historical records (Townsend, 1935), Bureau of Fisheries and Aquatic Resources (BFAR) archives and stranding records (Santos, 2001), and targeted researches (Dolar, 1199c; Dolar et al. 1997, Perrin et al, 1996), suggests that most of cetacean species are widely distributed throughout the Archipelago except for the restricted distribution of Irawaddy Dolphin in Malampaya Sound, Palawan and Guimaras Strait. Large whales are often sighted in deep areas e.g. Humpback whales around Fuga Island and strand in islands adjacent to deep areas e.g. in Sperm whale in Gen. Nakar, Quezon and in Sabtang Island in Batanes. Smaller dolphins and whales could be seen in both coastal and offshore areas some of which e.g. Bottlenose dolphins *Tursiops truncatus* are known nearshore dwellers while Fraser's dolphin have been found to feed in very deep areas like in Eastern Sulu Sea (Dolar, 1999c).

The 3 small dolphins of Family Delphinidae (Spinner dolphin*, Stenella longirostris*; Spotted dolphin, *Stenella attenuata* and Bottlenose dolphin*, Tursiops truncatus*) appears to dominate in abundance as per observation of Dolar et al. (1997) and Dolar (1999a) based on a systematic distribution and abundance survey conducted in Southeastern Sulu Sea in 1996. However there is still a huge requirement for surveys like the one mentioned to effect a more comprehensive analysis of the status of the population of each species of marine mammals in all the 2.2 M has of the waters of the country including its 200 miles Exclusive Economic Zone (EEZ).

The national plan of action for cetaceans in the Philippines formulated in 1994 involved 4 components: a) Survey and Research, b) Habitat and Resource Management, c) Policy and d) Public Information and Education and Capacity Building. With the passage of laws that fully protected the species that resulted in disappearance of reports on directed takes, recent efforts to conserve cetacean population in the country are now geared towards identifying new species and populations, maintaining habitats, reducing by-catch enforcing laws and implementing stranding rescue networks. These are collectively being conducted by concerned national and local government offices, non-governmental organizations (e.g. WWF-Philippines, Conservation International-Philippines and Earth Island Institute), the academe and even the private sector (e.g Ocean Adventure and Manila Ocean Park).

In this report, we present the status and management of cetaceans in the Philippines and give recommendations for future research work.

2. Data availability: Species

2.1. List of cetaceans

There are 27 species of cetaceans (Order Cetacea) confirmed thus far in Philippine waters (Table 1). The Order is divided into 2 Suborders; Suborder Odonticeti (toothed whales, dolphins and porpoises) and Suborder Mysticeti (baleen whales). Suborder Odonticeti is represented by four families including Delphinidae, Kogiidae, Physeteridae, Ziiphidae consisting of 16 spp, 2 spp., 1 sp., and 3 spp., respectively. Suborder Mysticeti is comprised of only 1 family – Balaenopetridae composed of 5 spp. All cetaceans in the Philippines are listed under CITES Appendix II except for Irrawaddy dolphin, Sperm whale and all Balaenopterids, which are listed under Appendix I.

One species have since been removed from the previous list due to the lack of confirmatory records, the finless porpoise (Perrin et al., 2005). Dolphins initially identified to be finless porpoises in Malampaya Sound and stranded in Turtle Islands turned out to be Irrawaddy dolphins.

.

2.2. Population studies

As of 2005, cetacean surveys have been conducted in an estimated 40% of Philippine waters (Perrin et al, 2005). Of these, estimates of abundance of spinner, pantropical spotted, Fraser's, common bottlenose and Risso's dolphins; short-finned pilot whale; melon-headed whale and dwarf sperm whale have been done in Southern Sulu Sea, Tanon Strait and Malampaya Sound. Malampaya Sound has likewise been surveyed for abundance of irrawaddy dolphin, the most endangered cetacean in the Philippines. An estimated 77 individuals (CV=27%) occur in a limited area of the inner Sound of around 133.7 km2 (Perrin et al., 2005).

2.3. Management/conservation measures

All cetaceans in the country are protected with the promulgation of several Philippine laws (Table 2). This include the Republic Act 8550 (Philippine Fisheries Code of 1998), Republic Act 9147 (Wildlife Resources Conservation and Protection Act) and the Fisheries Administrative Orders 185 series of 1992 and 185-1 series of 1997. The Philippines is also a signatory to several international agreements including the Convention on Migratory Species (CMS) and the Convention on the International Trade of Endangered Species of Wild Fauna and Flora (CITES) (Table 3). As such, cetaceans in the country are subjected to international management and trade regulation.

Previously, cetacean management and conservation in the Philippines is being overseen by the Inter-Agency Task Force on Marine Mammal Conservation (IATFMMC). The recommendatory body was created in 1993 by virtue of a DENR administrative order recognizing that matters pertaining to the conservation, management and research of marine mammals cuts across so many sectors. Its membership included government agencies (DA-BFAR, DENR-PAWB, Department of Tourism), Academe (University of the Philippines and Silliman University), NGO (WWF-Philippines) and the private sector (Bookmark Inc.). One of the major output of the IATFMMC is the establishment of a strategic action plan for marine mammals in the country (Perrin et al., 1996).

Eventually, management of cetaceans fell under the legal jurisdiction of the Department of Agriculture-Bureau of Fisheries and Aquatic Resources by virtue of the Joint DA-DENR Memorandum Order No. 01, Series of 2000 and later by Republic Act 9147 or the Wildlife Resources Conservation and Protection Act. Because of this, the IATFMMC and its activities slowly disappeared.

RA 8550 likewise acknowledges the Palawan's Strategic Environmental Plan for Palawan, whereby responsibility for wildlife resources in Palawan, whether aquatic or terrestrial, was devolved to the Palawan Council for Sustainable Development (PCSD).

2.4. Observation hotspots

Figure 1 Location of cetacean hotspots in Philippine waters

Many coastal areas in the country could be considered as observation hostspots since cetaceans abound in these areas where numerous anthropogenic activities are. Nevertheless, Santos (2001) has suggested some areas that need increased level of attention based on the prevalence of strandings and reported by-catch activities (Fig. 1). These areas were affirmed as key biodiversity conservation priorities under the National Biodiversity Strategy and Action Plan in addition to Tanon Strait and Bohol Sea (NBSAP) (Ong et al., 2002).

a. Fuga Island Area. There is reported presence of Humpbacked whales in the area and are being impacted by blast fishing activities

b. Zambales Coast. This has been a site for numerous cetacean strandings including whalesharks. This area has been identified as one of the highly productive areas base on oceanographic studies.

c. Pangasinan Coast. This has been a also a site for numerous cetacean strandings including whale sharks. This area has been identified as one of the highly productive areas based on oceanographic studies.

d. Saranggani Bay. A number of stranding reports have been made in this area, including Dugongs, Spinners, Bottlenose*, Mesoplodon* and *Kogia* spp.

e. Palawan Waters. The waters of Palawan province have been noted to exhibit the most number of marine mammal by-catch incident.

f. Malampaya Sound, Palawan. This area is home to the suspected last remaining population of Irawaddy dolphins in the Philippines and said populations are being impacted by incidental takes, local fishery (e.g. fish coral) and habitat degradation.

2.5. Strandings

Figure 2 Location of some cetacean stranding events in Philippine waters

Strandings or beaching of cetaceans of different species appears to occur all throughout the Philippine archipelago but with no apparent patterns (Fig. 2). Just recently, however, the country perhaps experienced the largest cetacean mass stranding in its recorded history when more than 200 melon-headed whales (*Peponocephala electra)* were stranded in the coastal towns of Bataan Province, Philippines. The animals were successfully lead back to the ocean except for the 4 dead beached whales later found in Abucay, Bataan. Included in the dead are 2 pregnant females one of which has given birth to a dead calf also found in the beach. The cause of the stranding is unknown.

Rescue, release and rehabilitation manuals, procedures and network has already been established and developed in the country through the concerted effort of governmental and non-governmental organizations, the academe and the private sector (Aragones and Gaile, 2008). This procedure has been disseminated to various entities and is now being followed when strandings occur.

3. Conservation issues

Since laws to protect cetaceans are already in place and there appears to be a high level and a wide-ranging awareness among the people, the major and main issue now is improvement of law enforcement. While there have been efforts to train law enforcement agencies such as the coast guard, local government units BFAR personnel at the regional offices, the wide archipelagic nature of the Philippines coupled with having a diverse cetacean population and a low number of personnel contributes to the difficulty in implementing the law.

Among the other issues that still need to be addressed include habitat degradation, by-catch, insufficient abundance estimates and very recently, effects of climate change. All of these concerns are still impacting and will impact the cetacean population in the country unless properly and immediately addressed.

4. Incidental takes (by-catch)

In the Philippines, by catch particularly in cetacean have been since the 1990s (Table 4) (Dolar 1999a and 1999b). Most of the reports indicate that these practices are unsustainable. There have been reports of localized directed and incidental takes happening in some areas and islands around the Philippines for local consumption and for shark baits (Perrin et al., 1996; Perrin et al., 2005).

Based on available information, cetacean by-catch appears to occur throughout the archipelago whether the fisheries involve is small scale (municipal fishery type) or large scale (e.g. commercial tuna purse seining) (Fig. 3). The major fishing gears that have been reported to incidentally take dolphins baby ringnet, bagnet, beach seine, set gillnet, bottom longline, castnet, crabtrap, drift gillnet (*pamo, palaran*), drift longline, drivenet, fish corral, flying fish net, stationary liftnet, twoboat lift net, purse-seine, shark net, and troll line (Dolar, 1999; Dolar et al, 1997; Dolar et al, 1995; Dolar 1994; Dolar 1990; Alava, 1995; Calvelo 1995). Blast "dynamite" fishing which is an illegal form of fishing method has also been reported (Santos, 1997) to accidentally catch dolphins. However, although there are several publications have been made on cetacean by-catch, these reports often describe localized cetacean fishery-interactions. It is therefore difficult to make a statistical inference on how many cetaceans are taken accidentally by the marine capture fishery sector annually. Dolar (1992) showed that around 600 dolphins have been killed by the commercial tuna purse seining fleets but said report at the same time cautioned that due to a lack of accurate data on fishing fleet operational dynamics, the estimate may very well be underestimated.

Figure 3 Location of some incidental (bycatch) takes of cetaceans in Philippine waters.

5. Recommendations for future research studies

The Report of the Second Workshop on the Biology and Conservation of Small Cetaceans and Dugongs in Southeast Asia (Perrin et al., 2005) has listed specific areas of research that needs to be conducted, which are still relevant to date:

1) Population modeling of Irrawaddy dolphins; habitat use and range; study of fishery interactions (by-catch) and gear modification in Malampaya Sound.

2) Research on Taiwanese-directed catch or bycatch in Babuyan islands, northern Luzon (through interviews or actual observation).
3) Species identification and stock identity of bottlenose dolphins in Malampaya Sound, Palawan and Babuyan islands.
4) Abundance of Fraser's dolphins in Babuyan Islands, Bohol and Leyte.
5) Research on areas of "pamo" fisheries for large pelagics.
6) Further investigation of spinner dolphin population in Balayan Bay, Batangas.
7) Stock identity of Risso's dolphins in Palawan, Bohol and Sulu sea through photo-identification.
8) Photo-identification of killer whales in Davao or Aliguey area.
9) Photo-identification of short-finned pilot whales in known areas of occurrence in the country.
10) Surveys of other sites in the Philippines that may harbor Irrawaddy dolphins.
11) Strategic survey of new sites for identification of species, threatened populations and habitats, and important conservation sites.
12) Sustained monitoring of areas that are known to have cetacean takes.
13) Socio-economic studies of fisheries with significant cetacean by-catch, and possible development of alternative livelihoods and whale watching.
14) Levels and effects of pollutants on populations.
15) Expansion of stranding networks to support research objectives and conservation goals.
16) Association of rough-toothed dolphins in Babuyan Islands with Taiwanese long-line fishery.
17) Genetic study of the Irrawaddy dolphin population in Malampaya Sound.

In addition to this list is the conduct of broadscale survey of the remaining undocumented 60% of Philippine waters for cetaceans. A joint marine mammal survey proposal of the Sulawesi Sea among the countries of Indonesia, Malaysia and the Philippines has been endorsed by the Sub-Committee on Species of the Tri-National Committee of the Sulu-Sulawesi Marine Ecoregion or SSME. This proposal is currently being fully developed for sourcing funds (Fig. 4).

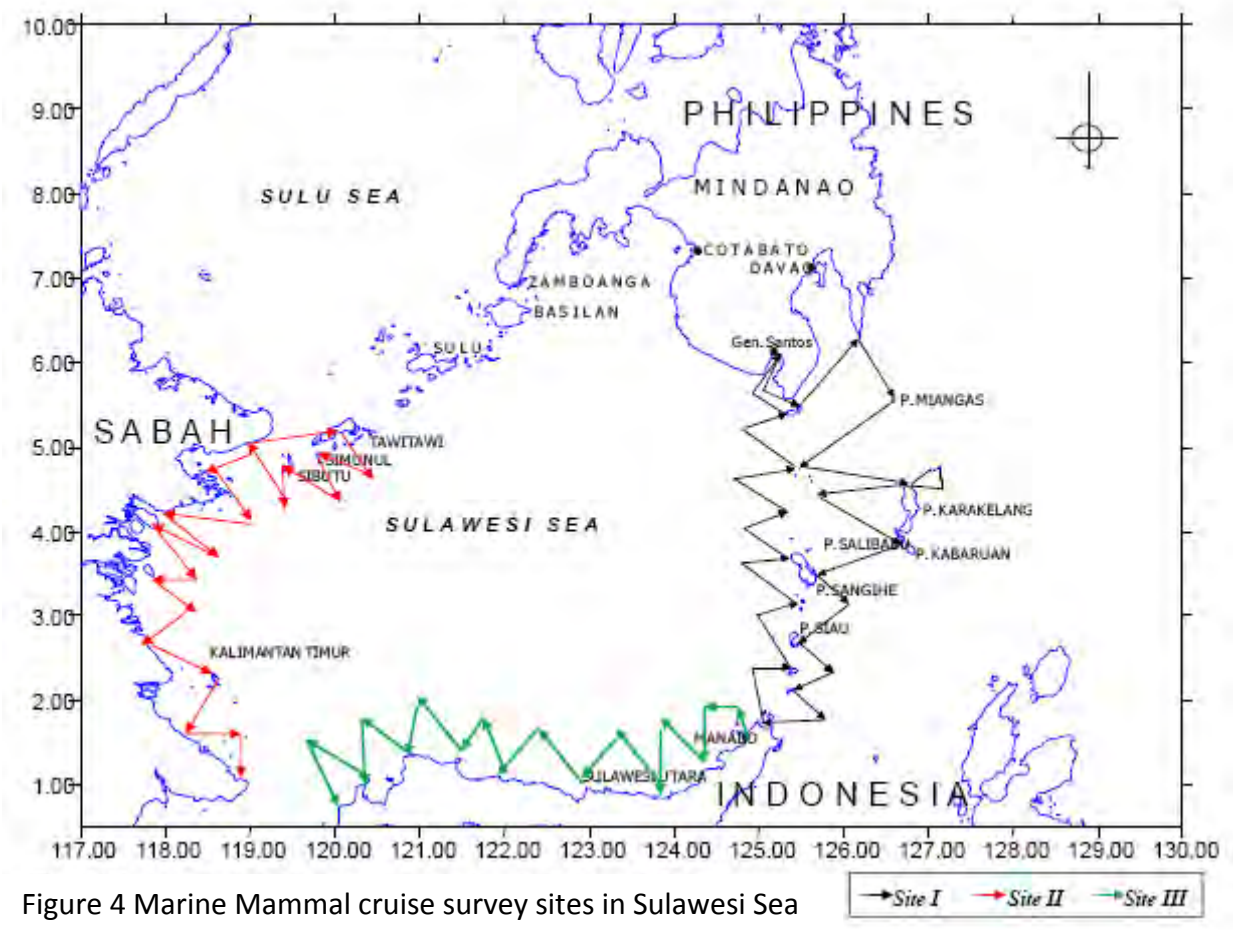

Figure 4 Marine Mammal cruise survey sites in Sulawesi Sea

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Table 1: List of cetaceans confirmed to be present in Philippine waters

ORDER CETACEA*	CITES Classification (Appendices**)
Suborder Odonticeti (Toothed whales, dolphins and porpoises)	
Family Delphinidae	
1. Gray's Spinner dolphin *(Stenella longirostris longirostris)*	II
2. Dwarf spinner dolphin (*Stenella longirostrisroseiventris)*	II
3. Pantropical spotted dolphin *(Stenella atenuata)*	II
4. Striped dolphin (*Stenella coeruleoalba*)	II
5. Fraser's dolphin *(Lagenodelphis hosei)*	II
6. Indo-Pacific Bottlenose dolphin *(Tursiops truncatus)*	II
7. Common Bottlenose dolphin (*Tursiops aduncus*)	II
8. Risso's dolphin *(Grampus griseus)*	II
9. Melon-headed whale *(Peponocephala electra)*	II
10. Pygmy killer whale *(Feresa attenuata)*	II
11. Short-finned pilot whale *(Globicephala macrorhynchus)*	II
12. False killer whale (*Pseudorca crassidens*)	II
13. Killer whale *(Orcinus orca)*	II
14. Rough toothed dolphin *(Steno bredanensis)*	II
15. Indo-Pacific Hump-backed dolphin (*Sousa chinensis*)	II
16. Irrawaddy dolphin (*Orcaella brevirostris*)	I
Family Kogiidae	
17. Dwarf sperm whale *(Kogia simus)*	II
18. Pygmy sperm whale (*Kogia breviceps*)	II
Family Physeteridae	
19. Sperm whale *(Physeter macrocephalus)*	I
Family Ziphiidae	
20. Blainville's beaked whale *(Mesoplodon densirostris)*	II
21. Cuvier's beaked whale *(Ziphius cavirostris)*	II
22. Longman's beaked whale (*Indopacetus pacificus*)	II
Suborder Mysteceti (Baleen whales)	
Family Balaenopteridae	
23. Humpback whale *(Megaptera novaeangliae)*	I
24. Bryde's whale *(Balaenoptera edeni)*	I
25. Fin whale (*Balaenoptera physalus*)	I
26. Blue whale (*Balaenoptera musculus*)	I
27. Omura's whale (*Balaenoptera omurai*)	I

* Protected under Fisheries Administrative Order No. 185, Series of 1992; 185-1, Series of 1997; RA 8550 of 1998

** CITES Appendix I Includes species threatened with extinction and for which trade must be subject to particularly strict regulation and only authorized in exceptional circumstances
** CITES Appendix II include species that are not necessarily now threatened with extinction but may become so unless trade is strictly regulated.

Table 2: List of Philippine laws that protect cetaceans in the country

Philippine Law
Republic Act 8550 (Philippine Fisheries Code of 1998): *provides for the development, management and conservation of the fisheries and aquatic resources* **Republic Act 9147 (Wildlife Resources Conservation and Protection Act):** *provides for the conservation of the country's wildlife resources and their habitats for sustainability* **Republic Act 8485 (Animal Welfare Act of 1998):** *provides for protection and promotion of the welfare of all animals in the Philippines* **Fisheries Administrative Order 185 series of 1992:** *ban on all dolphins* **Fisheries Administrative Order 185-1 series of 1997:** *added whales and porpoises in ban* **Fisheries Administrative 208 series of 2001:** *listed 20 cetacean species as "endangered" and are therefore protected by law* **Presidential Proclamation 342 series of 2000** *Malampaya Sound declared a protected seascape and landscape*

Table 3: List of International Agreements related to cetacean where the Philippines is a signatory country.

International Agreements
Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES) *aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival* **Convention on Migratory Species (CMS)** *aims to conserve terrestrial, marine and avian migratory species throughout their range* **Convention on Biological Diversity (CBD)** *aims to pursue in accordance with its relevant provisions, the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.* **Agenda 21 (UNEP's Sustainable Development)** *aims at preparing the world for the challenges of the next century and reflecting a global consensus and political commitment at the highest level on development and environmental protection*

Table 4. Some published information on incidental taking of cetaceans in the Philippines from 1990 - present

Location	Species Caught *(English/Scientific/Local Name)*	Fishing Gear Used	Estimated No. of Animals Caught or Killed	Source
Philippine Waters, Papua New Guinea and Indonesia	Spinner Dolphins/ *Stenella longirostris*/	Purse-Seines	600/ year	Dolar, 1993
LUZON				
Pag-asa, San Jose, Mindoro	Bottlenose Dolphins/ *Tursiops truncatus*/	Driftnet		Dolar, 1999
Lapu-lapu, San Jose, Mindoro	Dolphins	Lift nets		Dolar, 1999
PALAWAN				
Taytay Bay, Palawan	Dolphins	Purse seine (from Navotas),Driftnet , Fish Corral		Dolar, 1999
Bulalacao Is., Coron, Calamian Group	Dolphins	Driftnet (from Navotas)		Dolar, 1999
Araceli (Dumaran Is.) Palawan	Dolphins	Purse seine		Dolar, 1999
Roxas, Palawan		Shark nets (in Green Is.)		Dolar, 1999
Tagburos, Puerto Princesa, Palawan	Dolphins	Purse seine ,Gill nets		Dolar, 1999
Malampaya Sound (New Guinlo, Old Guinlo and San Jose)	Irawaddy dolphins/ *Orcaella brevirostris*/ "lampasut"	Bottom-set gillnets ('palubog"), Fish corrals ("baklad"), Liftnets ("bukatot"), Crab traps		Dolar, et al., __
Sta. Lourde, Honda Bay, Palawan	Spinner Dolphins/ *Stenella longirostris*/Bottlenose Dolphins/ *Tursiops truncatus*/ Dugong/ *Dugong dugon*/	Purse seine, Drift nets		Dolar, 1999
Brooke's Point and Rio Tuba, Palawan		Drive nets, Bagnets Bottom set net		Dolar, 1994
VISAYAS				
Basay and Malabuhan, Siaton, Negros	Fraser's Dolphin/*Lagenodelphis hosei*/, Spinner Dolphins/ *Stenella longirostris*/ ,Risso's Dolphin/ *Grampus griseus*/	Driftnet	428 (January to June)	Dolar, 1994
Pamilacan Island, Bohol	Fraser's Dolphin/ *Lagenodelphis hosei*/ ,Spinner Dolphins/ *Stenella longirostris*/, Pantropical Spotted Dolphin/ *Stenella attenuata*/	Driftnet	20 (March to June)	Dolar, 1994
Liobon, Lupa-	Pantropical Spotted Dolphin/			Dolar et al.,

Location	Species Caught *(English/Scientific/Local Name)*	Fishing Gear Used	Estimated No. of Animals Caught or Killed	Source
pula, Mapun Island (Badjao)	*Stenella attenuata*/			1997
Malabuhan, Siaton, Negros	Spinner Dolphins/ *Stenella longirostris*/, Risso's Dolphin/ *Grampus griseus*/, Pantropical Spotted Dolphin/ *Stenella attenuata*/	Purse seine Driftnets		Dolar, 1999
Bonawon, Negros	Spinner Dolphins/ *Stenella longirostris*/	Purse seine Tuna Longlines		Dolar, 1999
Bayawan, Negros	Spinner Dolphins/ *Stenella longirostris*/ , Pantropical Spotted Dolphin/ *Stenella attenuata*/	Purse seine		Dolar, 1999
Lintub, Basay	Spinner Dolphins/ *Stenella longirostris*/	Purse seine		Dolar, 1999
Yardahan, Basay	Dolphins	Purse seine		Dolar, 1999
Kulipapa, Negros	Dolphins	Flying fish nets, purse seine, cast nets		Dolar, 1999
Dalipi, San jose, Antique, Panay	Dolphins	Nets		Dolar, 1999
Culasi, Antique, Panay	Spinner Dolphins/ *Stenella longirostris*/ , Bottlenose Dolphins/ *Tursiops truncatus*/	Driftnet		Dolar, 1999
MINDANAO				
Selinog and Aliguay Islands, Mindanao Selinog	Fraser's Dolphin/ *Lagenodelphic hosei*/, Spinner Dolphins/ *Stenella longirostris*/ , Risso's Dolphin/ *Grampus griseus*/, Pantropical Spotted Dolphin/ *Stenella attenuata*/	Driftnet , Setnet , Multi-hook longlines	90-120/ year	Dolar, 1994

Annex 12

Information Gathering and Cetacean Research in Thailand

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1. Introduction

In the past, cetacean had been harvested in large number for food and other transformed products. Now a day, cetaceans are threatened by human activities and the deteriorated environmental condition. This results in reduction of the population size. Therefore they have been listed as protected species according to the appendix I and II in the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES). However, there are very few cetacean studies in Thailand. Although the species are not mainly targeted by the Thai fisheries; but the country's harvest activities more than 3,000,000 ton per year (Fig. 1) and poor management, as criticized by other countries, may affect the cetacean population.

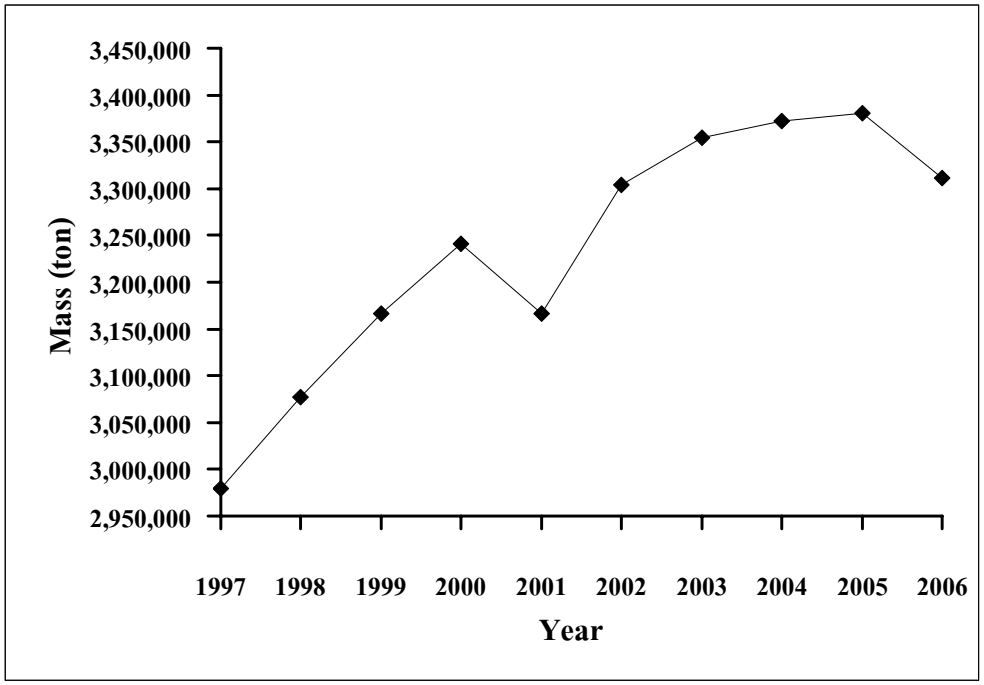

Figure 1 Total marines production of Thailand, 2006 (Fishery statistics analysis and research group,2006)

2. Data availability

The order cetacean comprises 80 species worldwilde, about 32 of which occur in Western Central Pacific. Cetacean in Thailand have been seriously studied since 1993 by Phuket Marine Biological Center, Department of Fisheries (the organization was restructured in 2002 and has been under the supervision of Department of Marine and Coastal Resources). Cetacean in Thailand can be classified into 23 species from 6 families. Of the 23 species, 17 species are found in the Gulf of Thailand and 19 species are found in Andaman Sea (Chantrapornsyl, et al. 1996; Adulyanukosol, et al. 2004). Taxonomic Relationships of Thai Cetacean (Fig. 2) and its distribution is in Table 1.

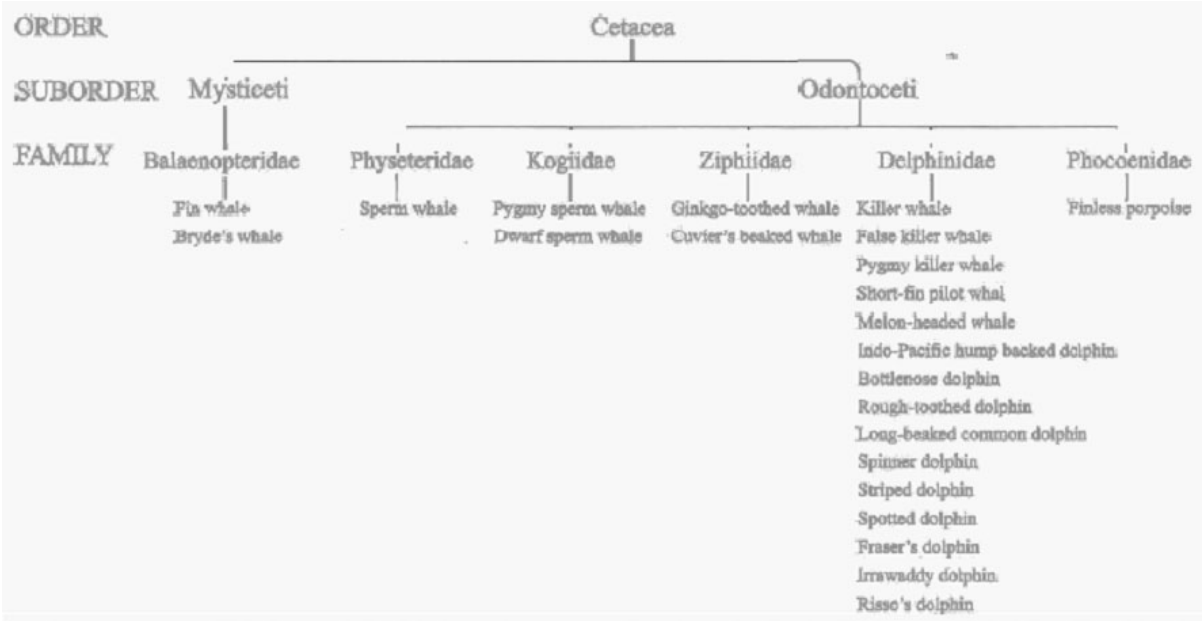

Figure 2 Taxonomic Relationships of Thai Cetacean (Adulyanukosol, K and K. kittiwattanawong, 2004).

Figure 3 The five fisheries survey area of DOF

The data which the department of fisheries had collected from both commercial and research vessels can be classified into five areas; Area 1 (Eastern part of the gulf of Thailand) covers part of Chunburi province, Rayong province, Chantaburi province, and Trat province. Area 2 (Upper gulf of Thailand) covers part of Chonburi province, Chacheongsao province, Samutprakarn province, Samutsakorn province, Samutsongkram province, Phechaburi province and part of Prachaubkirikhan province. Area 3 (Central part of the gulf of Thailand) covers part of Prachaubkirikhan province, Chumporn province and Suratthani province. Area 4 (Lower gulf of Thailand) covers Nakornsrithammarat province, Songkhla province, Narathiwat province and Pattani province. Area 5 (Andaman Sea) covers Ranong province, Phang nga province, Phuket province, Krabi province, Trang and Satun province.

There was no report of cetacean carcass collected from commercial vessel. However, cetaceans were sighted by the research vessel but they were not classified in detail.

3. Whale and Dolphin hotspot

Area 1 (Eastern part of the Gulf of Thailand): There were reports of whales and dolphins in the area of Ao Kungkrabean of Chanthaburi province and Ao Trat of Trat province (Chantrapornsyl, et al. 1996; Adulyanukosol, et al. 2004).

Area 2: the upper gulf of Thaliland contains many water shades. Whales and dolphins watching have also been developed as a form of ecotourism in this area. There have been reports of whales and dolphin sighting in the area of Bang pakong river in Chacheongsao province, Tha Chin river in Samutsakorn province, Maeklong river in Samutsongkram province, Cha-am district in Phechaburi province and Pranburi district in Prachaubkirikhan province (Chantrapornsyl, et al. 1996; Adulyanukosol, et al. 2004).

Area 3 (the central part of the gulf of Thailand): There were reports of whales and dolphin sighting in the area of Ang Thong Island of Suratthani province which is a very important nursing ground for the aquatic animal in Thailand (Chantrapornsyl, et al. 1996; Adulyanukosol, et al. 2004).

Area 4: Lower gulf of Thailand, contains very important water shades such as Talay-Noi national park covering Pattalung province and part of Songkhla lake. There were reports of whales and dolphins sighting in the area of Ao Kanom in Nakornsrithammarat province and Songkhla lake in Songkhla province (Chantrapornsyl, et al. 1996; Adulyanukosol, et al. 2004).

In area 5 (Andaman Sea), there were many reports of whales and dolphin sighting. Whales and dolphins have been most sighted in this area. The sightings have been reported from all provinces in this area however the areas that have high frequency of sighing are Phang nga Bay of Phang nga province, Phuket province, Krabi province and sea grass bed in Sikao district of Trang province (Chantrapornsyl, et al. 1996; Adulyanukosol, et al. 2004).

Table 1. Species and distribution of Cetacean in Thailand

Family	Common name	Scientific name	Distribution	
			Andaman sea	Gulf of Thailand
Balaenopteridae	Fin whale	*Balaenoptera physalus*	/	/
	Bryde's whale	*Balaenoptera edeni*	/	/
Physeteridae	Sperm whale	*Physeter macrocephalus*	/	-
Kogiidae	Pygmy sperm whale	*Kogia breviceps*	/	/
	Dwarf sperm whale	*Kogia simus*	/	-
Ziphiidae	Ginkgo-toothed whale	*Mesoplodon ginkgodens*	/	-
	Cuvier's beaked whale	*Ziphius cavirostris*	/	-
Delphinidae	Killer whale	*Orcinus orca*	/	/
	False killer whale	*Pseudorca crassidens*	/	/
	Pygmy killer whale	*Feresa attenuata*	/	/
	Short-fined pilot whale	*Globicephala mucrorhynchus*	-	/
	Melon-headed whale	*Peponocephala electra*	-	/
	Hump-backed dolphin	*Sousa chinensis*	/	/
	Bottlenose dolphin	*Tursiops aduncus*	/	/
	Rough-toothed dolphin	*Sfeno bredanensis*	/	/
	Long-beaked common dolphin	*Delphinus capensis*	-	/
	Spinner dolphin	*Stenella longirostris*	/	/
	Striped dolphin	*Stenella coeruleoalba*	/	/
	Spotted dolphin	*Stenella attenuata*	/	/
	Fraser's dolphin	*Lugenodelphis hosei*	/	-
	Irrawaddy dolphin	*Orcaella brevirostrii*	/	/
	Risso's dolphin	*Grampus griseus*	/	-
Phocoenidae	Finless porpoise	*Neophocaena phocaenoides*	/	/

4. Fisheries cetacean interaction

- Cetacean is the indicator for fisheries resources abundance
- Dolphin created two problems to the fisherman. First, they steal fishes from the (Bamboo Stake Trap). When they are trapped in the Bamboo Stake Trap, they cannot escape and often die. The fisherman has to remove the carcass and reports to the officer. Dolphins are protected species in Thailand.
- A survey on fishing gear in the restricted sea grass areas of the Trang province by Wudtichai (1994) reported 28 type of fishing gears were found in the area. Push net, beach seine and otter trawl were destructive sea grass and dugong (Cetacean?). The experiment on gill net operation using crab gill net, whiting gill net and trammel net were not destructive sea grass and dugong (Cetacean?)

5. Conservation for cetacean

Cetacean is contain in CITES Appendix I and Appendix II, therefore it 's protect by Wildlife reservation and protection act (1992) and Thai Fishery Law**.** There are many laws and regulations that involve cetacean.

Thai Fishery Law to involved cetacean conservation

- Notification of Trang Province

Re: Prohibition of Certain Kinds of Fishing Appliances in Fishing in the Specified Sea Grass Bed. Given on May 16, B.E.2535 (1992)

- Notification of Agriculture and Cooperatives

Re: Prohibition of Trawls and Push Nets Used with Motor Vessels in Fishing in the Lake in Songkhla and Pattalung Provinces.Given on August 11, B.E. 2515 (1972)

Re: Prohibition of Certain Kinds of Appliances in Fishing in Fisheries, which are Habitat of Coral Reefs or Places of Underwater Rocks or Artificial Reefs. Given on February 10, B.E.2540 (1997)

Re: Prohibition of Dolphins. Given on June 18, B.E. 2533 (1990)

Re: Determination of Areas in which Fishing Applicances, i.e; Trawls and Push Nets used with Motor Vessels, are Prohibited. Given on July 20,B.E. 2515 (1972)

Re: Prohibition of Certain Kinds of Appliances in Fishing in Fisheries, which are Habitat of Coral Reefs or Places of Underwater Rocks or Artificial Reefs. Given on February 10, B.E.2540 (1997)

Re: Prohibition of Set Bag Nets in Fishing in the Lake in Songkhla and Pattalung Provinces.Given on March 22, B.E. 2519 (1976)

Re: Prohibition of Trawls and Push Nets in Fishing in Phang Nga Bay.Given on August 1, B.E. 2522 (1979)

Re: Prohibition of Certain Kinds of Fishing Appliances in Spawning and Breeding Seasons in the Locality of Prachuab Kirikhan, Chumporn and Surat Thani Provinces. Given on September 24, B.E.2542 (1999)

Re: Prohibition of Certain Kinds of Fishing Appliances in Spawning and Breeding Seasons in the Locality of Prachuab Kirikhan, Chumporn and Surat Thani Provinces. Given on September 24, B.E.2542 (1999)

Re: Prohibition of Surrounding Nets in Fishing in the Lake of Songkhla No 3 (B.E. 2537).Given on February 15, B.E. 2537 (1994)

Cetacean and their habitat conservation approaches

1) Reduce the causes of the mortality (both direct and indirect) of the cetacean by enforcing the laws and regulations that concern cetaceans and their habitat. The examples of this measurement include stop illegal fishing in the area that cetacean are found and conserved the cetacean habitats.

2) Improve cetacean database and cetacean habitat by research and survey.

3) Create a cetacean and their habitat conservation awareness in private sector, government and local fisherman. This is especially important in the area where large number of cetacean are found.

4) There should be a cetacean rescue team to help cetacean that got entangle with fishing gears or in the case that cetacean are found stranded. The responsibility of this team also includes carcass management of the stranded cetacean.

6. Future research work on cetacean

Intensive cetacean researches are needed in all aspects. The future research should include biological study of the cetacean, migration pattern of cetacean found in Thailand and the impact of the fisheries on cetacean. All of these information are vital for establishing proper regulations for cetacean conservation.

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Annex 13

Status and Research on Cetaceans in Thailand

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1. Introduction

Last two decades, cetacean investigation along the coast of Thai waters both in the Gulf of Thailand and in the Andaman Sea was very limited. Systematic study on whale and dolphin biology in Thailand has initiated since 1993 by researchers of Phuket Marine Biological Center collaborative with some foreign researchers (Chantrapornsyl, et al 1996; Anderson and Kinze 1999). At present, much information on cetacean distribution has been obtained throughboth stranded specimen and direct sighting survey. (Adulyanukosol and Kittiwattanawong, 2004, Chantrapornsyl et al. 1996). Most research works now have being conducted and responsible by staffs of Department of Marine and Coastal Resources covering throughout the shoreline of Thai waters.

Data available showed that there is very few number of population of large cetacean off shore while some small cetaceans such as Irrawaddy and Hump-backed dolphin look extender in term of population size and distribution. One of hotspot for Bryde's whale found in the inner Gulf of Thailand in Petburi Province where as near-shore dolphin populations distribute wider in the Gulf of Thailand such as Bangpakong River in the inner gulf, Songkha Lake in the south of the gulf and Trat Province in the east coast of the gulf connected to Cambodian water (Adulyanukosol and Thongsukdee, 2005).

All cetaceans in Thai waters are aquatic protected animals listed in Wildlife preserved Act B.E.2535 (1992). Not only Thailand concerned about the decreasing of some cetacean, In the conference of the Convention of International Trade in Endangered Species of Wild fauna and flora which heal in Bangkok 2004 has accepted to change the list of Irrawaddy Dolphin from Appendix II to Appendix I. it mean all countries around the world interest in the declining of this species distributed only in East Pacific Ocean.

2. Species of cetacean recorded in Thai water

According to the data and information from sighting survey, by catch, stranding and skeleton keeping available along the coast of Thailand, A total of 24 species including 1 unconfirmed species (Omura Bryde's whale) of cetacean were recorded. They consist in total of 6 families as follows:

Family	Common name	Scientific name
1. Balaenopteridae	1. Fin whale	*Balaenoptera physalus*
	2. Dawrf Bryde's whale	*Balaenoptera edeni*
	3. Omura Bryde's whale (unconfirmed)	*Balaenoptera omurai*
2. Physeteridae	4. Sperm whale	*Physeter macrocephalus*
3. Kogiidae	5. Pygmy sperm whale	*Kogia breviceps*
	6. Dwarf sperm whale	*Kogia simus*
4. Ziphiidae	7. Ginkgo-toothbeacked whale	*Mesoplodon ginkgodens*
	8. Cuvier's beaked whale	*Ziphius cavirostris*

Family	Common name	Scientific name
5. Delphinidae	9. Killer whale	*Orcinus orca*
	10. False killer whale	*Pseudorca crassidens*
	11. Pygmy killer whale	*Feresa attenuate*
	12. Short-finned pilot whale	*Globicephala macrorhynchus*
	13. Melon-headed whale	*Peponocephala electra*
	14. Risso's dolphin	*Grampus griseus*
	15.Fraser's dolphin	*Lagenodelphis hosei*
	16.Bottlenose dolphin	*Tursiops aduncus*
	17. Common dolphin	*Delphinus capensis*
	18. Spinner dolphin	*Atenella longirostris*
	19.Striped dolphin	*Stenella coeruleoalba*
	20. Spotted dolphin	*Stenella attenuate*
	21.Rough-toothed dolphin	*Steno bredanenisis*
	22. Pacific Humpbacked dolphin	*Sousa chinensis*
	23. Irrawaddy dolphin	*Orcaella brevirostris*
6. Phoecoenidae	14. Finless porpoise	*Neophocaena phocaenoides*

3. Status and distribution of cetaceans in Thailand

Interview and at sea surveys have also provided a lot of information on cetacean distribution, there is a need for more hotspot surveys to assess cetacean abundance and distribution in the gulf and Andaman Sea. However from the data available now, only three kinds of near shore species, Irrawaddy dolphin, Indo-pacific hump-backed and finless porpoise found along the Gulf of Thailand with the hotspot in Trat province in East of Gulf, Bangprakong River in the inner gulf and in the south of the gulf particularly in Songkha Lake for Irrawaddy dolphin. In the Andaman sea there are always found many kind of dolphin and whale especially off shore cetacean such as spinner dolphin, common dolphin and false killer whale.

Baleen whale can be seen both in Thai gulf and Andaman coast of Thailand. Thai tourism authority have promoted some areas in the middle of the gulf, Prachupkirikhan Province to watch Bryde's whale, however the number of Bryde's is quite small, approximately 10-20 individuals.

4. Conservation and education

Whale and dolphin watching is an easily way to promote people to preserve this animals. Some areas now have developed the activity of whale watching under collaboration with local communities, Government sector and NGO. Bangprakong River in Chachoengsoa Province, near Bangkok is the most famous site for one day trip to Irrawaddy dolphin watch. Trip arrangement to see dolphin always make by local fisherman and the regulation of watching such as no feeding and fast driving t more approach dolphin have held by the community. The researchers supporting communities are currently being conducted by Department of Marine and Coastal Resources and WWF Thailand.

Education and awareness program is one of the topic that local fishers and communities who always poach to cetacean sighting are the first priority group to encourage more information and knowledge to conserve some cetaceans in their areas.

5. Fisheries interaction to cetaceans

The Irrawaddy dolphin, finless porpoise and hump-backed dolphin are probably the most severely affected species because of their near-shore distribution and susceptibility to entanglement. Recent survey revealed that Irrawaddy dolphin has almost entirely disappeared from Songkha Lake, a large lagoon system connected to the Gulf of Thailand that may be a substantial resident dolphin in the past. However accidental killing in gillnets and trawler caused by badly behavior of dolphin following and foraging with fishing boat might reduced cetacean numbers in some areas.

6. Future plan for research and management

Now Thailand has initiated two rescue teams working for marine endangered animals both in the gulf and Andaman sea coast. It is very important to locate areas of intensive fishing interactive with dolphin and whale. The networking between rescue staffs, local fishers and communities are created little by little. We hope to do more scientific aspects for response the question of cetacean behavior. Biopsies work will be more concentrated for the reason of stranding case and to do more investigation on genetic population structure, particularly for Bryde's whale and near shore dolphin in each area. Information from the future research will be facilitated to develop a conservation plan to guide government policies and manage economic development activities.

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Annex 14

Cetacean Researches at Phuket Marine Biological Center, Thailand

Mr. Kongkiat Kittiwattanawong, Phuket Marine Biological Center, Department of Marine and Coastal Resource, kongkiat@gmail.com

CETACEAN RESEARCHES AT PHUKET MARINE BIOLOGICAL CENTER

Kongkiat Kittiwattanawong

1

Overview

- Research timeline
- Survey and monitoring
- Stranding network and records
- Data obtaining from the stranded specimens
- Rescue of cetaceans
- Conservation and Management

2

Earliest documents

- 1950: **Suvatti.** Fauna of Thailand. 3 species.
- 1973: **Pelleri.** Contribution to the knowledge of Cetaceans of Southwest and Monsoon Asia (Persian Gulf, Indus Delta, Malabar, Andaman Sea and the Gulf of Thailand). 7 species.
- 1977: **Lekagul and Mcneely.** Mammals of Thailand. 12 species.
- 1989: **Pelleri, *et al.*** A dwarf form of the spinner dolphin from Thailand.
- 1996: **Chantrapornsyl, *et al.*** Whales and dolphins in Thailand. 19 species.

3

Marine mammals of Thailand

24 Species of cetacean
21 Species from the Andaman Sea
19 Species from the Gulf of Thailand

4

Phuket Marine Biological Center

-Department of Fisheries (1972-2001)	-Marine Ecology	-Initiated in 1987
-Department of Marine and Coastal Resources (2002-present)	-Taxonomy and Reference collection	-Survey and monitoring
-5 research stations	-Oceanography and pollution	-Stranding network and records
-6 research groups	-Marine resources evaluation and monitoring	-Data from the carcasses
	-Marine Endangered Species	-Rescue
		-Management and conservation

5

Survey and monitoring

Interview information, Land-based observation, Boat survey, Aerial survey, Acoustic technique, Cooperation with local community.

6

Sighting Records

Family	Common name	Scientific name
1. Balaenopteridae	Fin whale	*Balaenoptera physalus*
	Bryde's whale	*Balaenoptera edeni*
	Omura whale	*Balaenoptera omurai*
2. Physeteridae	Sperm whale	*Physeter macrocephalus*
3. Kogiidae	Pygmy sperm whale	*Kogia breviceps*
	Dwarf sperm whale	*Kogia sima*
4. Ziphiidae	Ginkgo-toothed whale	*Mesoplodon ginkgodens*
	Curver's beaked whale	*Ziphius cavirostris*
5. Delphinidae	Killer whale	*Orcinus orca*
	False killer whale	*Pseudorca crassidens*
	Pygmy killer whale	*Feresa attenuata*
	Short-finned pilot whale	*Globicephala macrorhynchus*
	Melon-headed whale	*Peponocephala electra*
	Indo-Pacific hump-backed dolphin	*Sousa chinensis*
	Bottlenose dolphin	*Tursiops aduncus*
	Rough-toothed dolphin	*Steno bredanensis*
	Long beaked common dolphin	*Delphinus capensis*
	Spinner dolphin	*Stenella longirostris*
	Striped dolphin	*Stenella coeruleoalba*
	Spotted dolphin	*Stenella attenuata*
	Fraser's dolphin	*Lagenodelphis hosei*
	Irrawaddy dolphin	*Orcaella brevirostris*
	Risso's dolphin	*Grampus griseus*
6. Phocoenidae	Finless porpoise	*Neophocaena phocaenoides*

7

Land-based observation

8

Land-based observation

9

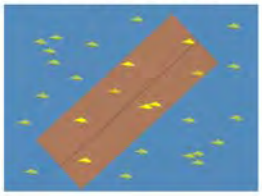
Boat survey methodology

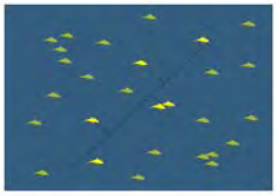
10

Line transect survey

- Detection probability
- Assumptions

Stripped transect





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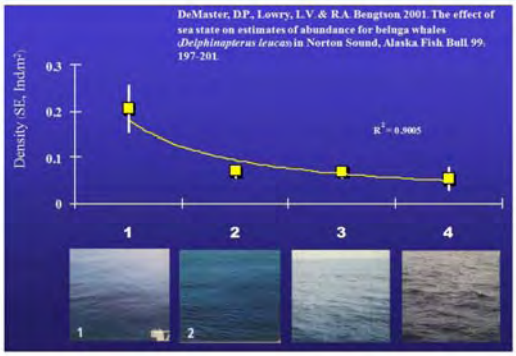
Sea state and estimation



12

Social interaction

13

Feeding behavior

14

Humpback dolphin: Photo ID

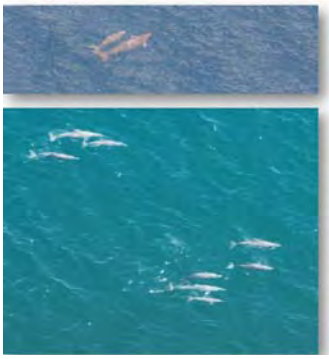
15

Aerial survey

- Started from 1997.
- Aircrafts: Polaris Flying boat, Microlite, Ultralite, Helicopter, Fixed wings Dornier.

16

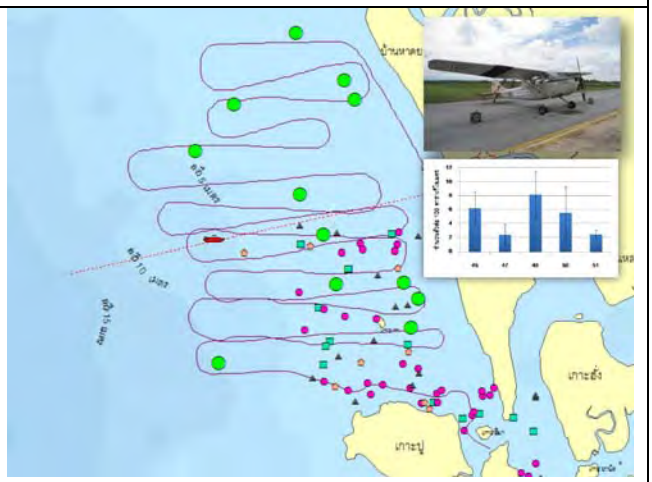
Aerial survey



\+
population estimation
Large coverage

\-
Species ID
Expensive
Difficult to get operate
Limitation to near shore areas

17



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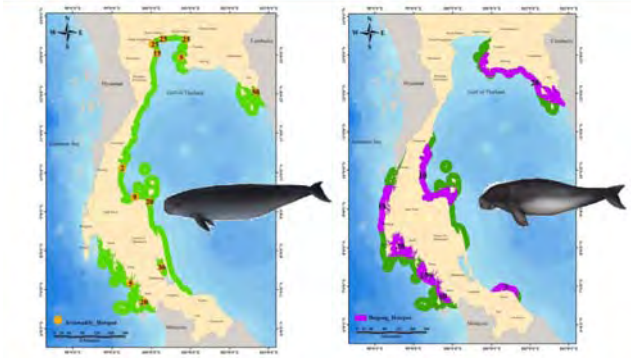
Survey results: www.pmbc.go.th

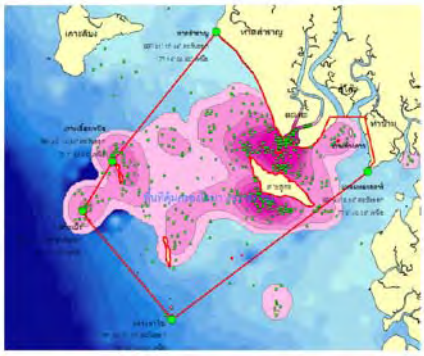


19

Cooperative data collecting

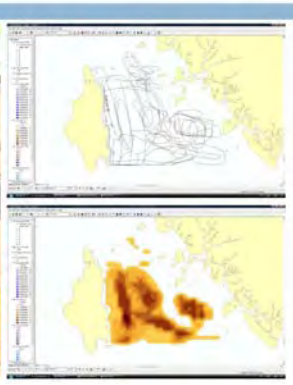
20

Sighting records by villagers



21

Resources mapping by local community



22

Opportunistic sighting

- Diving operators
- Regular route sea transportation
- Fisheries patrol, DOF
- SEAFDEC

23

Stranding of cetaceans

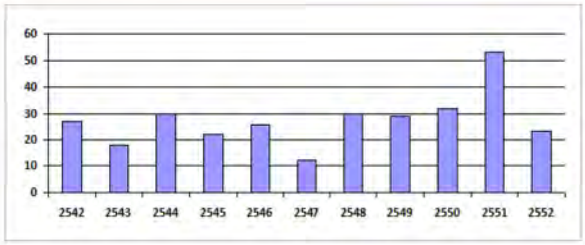
24

Interview information

- Tentative species and distribution over the past and present
- Relative abundance
- Attitude of local people
- Stranding network propaganda

25

Stranding records



26

9 Irrawaddy dolphins In 2009

5 spotted dolphins in 1999 & 8 in 2006

3 rough-toothed dolphins in 2008

30 false killer whales in 2008

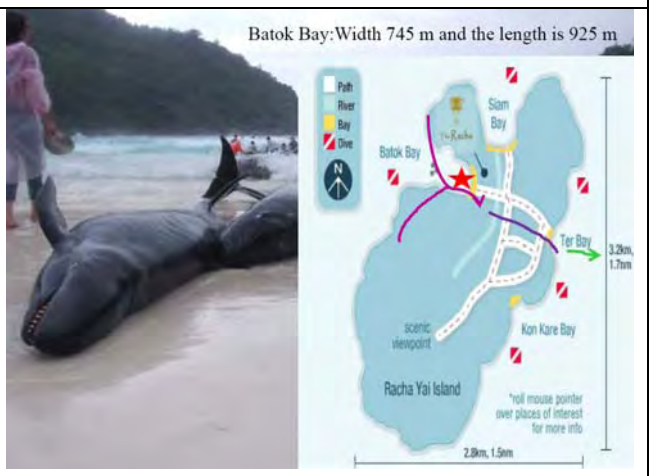
9 spinner dolphins in 1999

27

28

One whale died of drowning. 10 whales were transferred to opposite bay. We applied them with dexamethasone to prevent shock, measured length.

29



30

1 male and 2 females rough tooth dolphins; body lengths of 2.45-2.6 m.

31

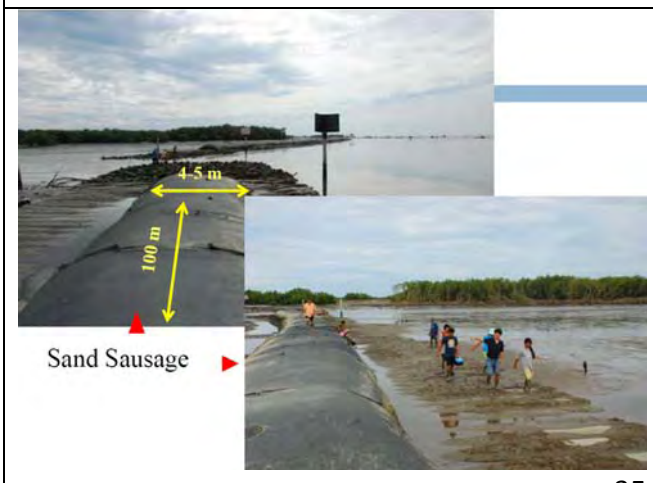
32

9 Irrawaddy dolphins stranded in front of mangrove beach in Mar 2009

33

- Dolphins were foraging into the shallow area.
- During low tide they were trapped behind the breaking water obstacles.

34



35

Cetacean rescue

36

37

38

39

Dolphin float supporter

40

41

42

43

Data from the carcasses

44

Pathology and Parasitology

45

Stomach content analysis

Humpbacked dolphin | Spotted dolphin | Bottlenose dolphin

46

Sea garbage

47

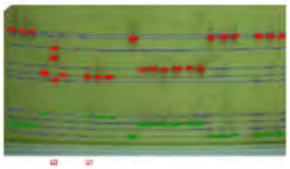
Aging

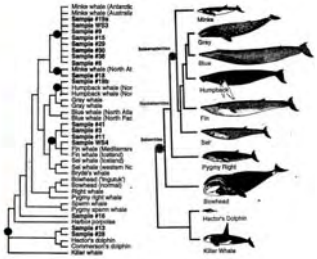
- Thin section of tooth

48

DNA analysis

- Population structure
- Inter-specific relationship
- Forensic identification





45

Heavy metal

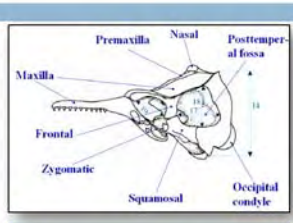
- Organotin
- Organochorine (under analysis)
- Heavy metal (under analysis)

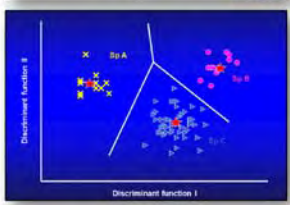
Abstract. Concentrations of butyltin (BT) and phenyltin (PT) compounds were measured in organs and tissues of five species of whales (Bride's whale [*Balaenoptera edeni*], false killer whale [*Pseudorca crassidens*], pygmy sperm whale [*Kogia breviceps*], short-finned pilot whale [*Globicephala macrorhynchus*], and sperm whale [*Physeter macrocephalus*]) found stranded on the coasts of Thailand. The mean concentrations of BTs in various whales were in the range of 0.157 to 1.03 mg kg^{-1} wet weight, which were higher levels than the reported concentrations in whales from other countries. PT concentrations were also detected in the range of 0.022 to 1.14 mg kg^{-1} wet weight. The concentrations of BTs and PTs in whales were higher than those in mussels from the coastal area of Thailand. Concentrations of tributyltin (TBT) and triphenyltin (TPT) compounds in whale organs and tissues were also compared, and it was found that TBT concentrations were generally higher in liver and lower in lung. TPT concentrations were higher in liver and blubber and lower in lung. Ratios of TBT degradation products in whale liver, namely monobutyltin (MBT) and dibutyltin (DBT), were higher than the ratios of TBT. TPTs in liver were found to be dominant among PTs. The patterns of BTs and PTs in false killer whale liver were different from those in the other whales by cluster analysis. Their concentrations in false killer whales were the highest among all whales in this study. False killer whales feed on squid and large pelagic fish containing higher concentrations of organotin (OT) compounds, so the differences in patterns and concentrations of OTs in liver between false killer whales and the other whales may be caused by difference in diet.

46

Whale bones

- Intra and inter specific variations.
- Radio-isotope dating





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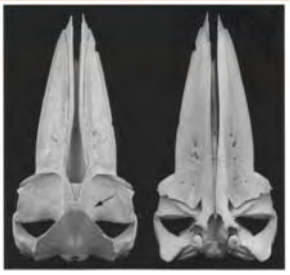
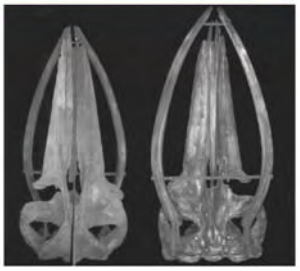
Bryde's whale

Balaenoptera omurai



Balaenoptera edeni



48

Fossil records: Unidentified ancient beaked whale

49

Protecting the cetacean

- **Fisheries Act 1990:** No one shall hunt dolphins.
- **Wildlife Reservation and Protection Act 1992:** 10 species of cetaceans have been listed as protected animals.
- **Export and import Act 2004**: No animals in order Cetacea shall be allowed to export and import.

50

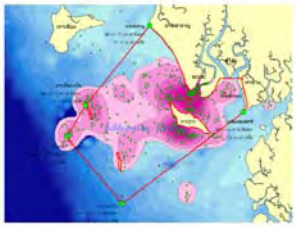
Transfer Irrawaddy dolphins from CITES App. II to I at COP 13, 2004

Appendix II

Appendix I

51

Whales and dolphins protected area



- Bottom-up approach.
- Community participation
  - Information collecting
  - Defining area
  - Regulation of fishing gears and other threats
  - Implementation
  - Enforcement
- Responsible GOs assist the process

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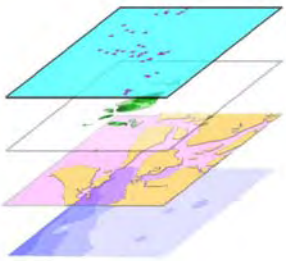
Database and GIS

- Stranding
- Distribution and abundance
- Managing information
- Internet
- Local community database system



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Information distribution

- Books
- Leaflets
- Posters
- Digital medias
- www.pmbc.go.th

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Annex 15

Cetacean Researches in Vietnam

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1. Introduction

Little information is available on the status of cetacean such as whales and dolphins in Vietnam. It is, but not statistically reported that whales and dolphins are sometimes observed by fishers when fishing and/or sailing in the offshore, nearshore waters, in and around river mouths. However, a few studies have been carried out to examine the occurrence and distribution of these animals as well as their population size and biology, etc.

In Vietnam, several cetacean researches have been done in the years of 1990s and 2000, including three sighting surveys conducted in the nearshore waters, in and around river mouths from 3 March – 8 April 1995, 17-26 October 1999 and from 2-11 April 2000 respectively; another sighting was carried out in the Mekong River Delta from 20-23 April 1996. In addition to sighting survey in 1995, the cetacean specimens were identified from bones stored at "Whale temples" located in many fishing villages a long the coast of Vietnam, and from preserved specimens at the Institute of Oceanography in Nha Trang, Hai Phong Branch of Institute of Oceanography, Research Institute for Marine Fisheries in Hai Phong, Museum of Quang Ninh Province and Yen Hung District museum, and from photographs of cetaceans.

Cetaceans such as whales and dolphins are known as the long-lived animals but low fecundity. It is reported that they are facing with the vulnerable reduction in population size not only in Vietnamese waters whether due to anthropogenic effects or limited habitats. In order to protect these animals, all activities in relation to the capture and trade of cetaceans are not allowed in Vietnam. In addition, all alive-individuals are incidentally caught by fishing gears that is also encouraged to release into the sea. However, this is a challenging task in Vietnam. One of our difficulties in management and conservation of cetacean resources is that we have insufficient information about these animals in addition to an un-built national strategies plan.

2. Data availability

Species accounts

Seventeen species of cetaceans including one baleen whale, two pygmy and dwarf sperm whales, 13 dolphins and one porpoise have now been confirmed to occur in Vietnam (Table 1). Of which, sixteen species were examined by Smith et al. (1995) based on specimens come from literature records, previously-unpublished specimen records and previously-unpublished sighting records. One remaining species, *Tursiops aduncus* was identified by scientist from the Vietnam-Russia Tropical Centre based on species caught in Kien Giang water in 2003.

Table 1. List of cetacean species have been confirmed to occur in Vietnam

No.	Common name	Latin name	Notes
	Baleen whales:	**Balaenopteridae:**	
1	Humpback whale	*Megaptera novaeangliae* (Borowski, 1781)	S
	Pygmy and dwarf sperm whales:	**Kogiidae:**	
2	Pygmy sperm whale	*Kogia breviceps* (de Blainville, 1838)	L, S
3	Dwarf sperm whale	*Kogia simus* (Owen, 1866)	S
	Marine or true dolphins:	**Delphinidae:**	
4	Short-finned pilot whale	*Globicephala macrorhynchus* Gray, 1846	S
5	False killer whale	*Pseudorca crassidens* (Owen, 1846)	S
6	Pygmy killer whale	*Feresa attenuata* Gray, 1875	S
7	Melon-headed whale	*Peponocephala electra* (Gray, 1846)	S
8	Risso's dolphin	*Grampus griseus* (Cuvier, 1812)	S
9	Rough-toothed dolphin	*Steno bredanensis* (Lesson, 1828)	S
10	Indo-Pacific humpbacked dolphin	*Sousa chinensis* (Osbeck, 1765)	S, O
11	Bottlenose dolphin	*Tursiops truncates* (Montagu, 1821)	L, S
12	Indo ocean bottlenose dolphin	*Tursiops aduncus* (Ehrenberg, 1833)	
13	Pantropical spotted dolphin	*Stenella attenuata* (Gray, 1846)	S
14	Spinner dolphin	*Stenella longirostris* (Gray, 1829)	S
15	Long-beaked common dolphin	*Delphinus capensis* Gray, 1828	S
16	Irrawaddy dolphin	*Orcaella brevirostris* (Gray, 1866)	L
	Porpoises:	**Phocoenidae:**	
17	Finless porpoise	*Neophocaena phocaenoides* (Cuvier, 1829)	L, S

(L = literature record, S = previously-unpublished specimen record, and O = previously-unpublished sighting record)

Population size

The population size of cetaceans is now unknown in Vietnam. The results from cetacean sightings conducted in 1995, 1996, 1999 and 2000 show that there were a small number of cetaceans found in each survey.

During a total of 913 km searching cetaceans from March to April 1995, we only had four cetacean sightings, two of humpback dolphin, one of an unidentified small whale (probably Cuvier's beaked whale), and one of unidentified dolphin. No dolphins were observed during the second survey conducted in the Mekong River in April 1996.

During the survey in October 1999, we used a commercial fishing boat to search for cetaceans along 665 km of trackline in coastal and offshore waters of the Gulf of Tonkin. In this survey we found five cetacean sightings: two of Indo-Pacific humpbacked dolphins *Sousa chinensis*, one of finless porpoises *Neophocaena phocaenoides*, one of a mixed school of pantropical spotted dolphins *Stenella attenuata* and probable spinner dolphins *S. longirostris* (subspecies unknown), and one of a probable bottlenose dolphin *Tursiops sp*. (see details in Table 2).

In the last sighting in April 2000, we searched along 1,146 km of track line in the same waters with the same boat as mentioned. We had four sightings: one of bottlenose dolphins (*Tursiops sp.*), one of spinner dolphins (probable dwarf form – *S.l. roseiventris*) and two of Indo-Pacific humpbacked dolphins (see details in Table 3).

Table 2. Details of cetacean sighting during 17-26 October 1999 survey of the Gulf of Tonkin

Sight	Date	Time	Position	Species	Group	Comments
1	17	11:08	20°45.17N 106°52.12E	Indo-Pacific humpbacked dolphin	2-4-2*	Mother/young pair. Larger one creamy white with a hint of pink and blue/gray speckles on dorsal surface. Smaller one all dark gray. Small possibility that a resighting after turning the vessel was of a separate pair-thus the high estimate of four individuals.
2	18	14:42	20°42.90N 107°20.35E	Finless porpoise	2-2-2	Sighting made in Beaufort 5 conditions
3	22	11:56	19°27.58N 106°56.27E	Pantropical spotted dolphin (80%)and probable spinner dolphin (sub species ?) (20%)	50-70-100	Slighting made in Beaufort 5 conditions. A small proportion of the school had distinctively more triangular fins. No other distinguishing features of spinner dolphins were observed before we lost sight of the group. Several neonates were present.
4	25	16:17	20°01.14N 106°37.69E	Bottlenose dolphin (?)	1-1-1	Sighting made off effort in Beaufort 7 conditions. Identification tentative.
5	26	13:14	20°49.90N 106°47.56E	Indo-Pacific humpbacked dolphin	3-3-3	Sighting made off effort in the rain but condition later cleared. Giving us clear views of the animals. Two dolphins appeared similar to those in sighting #1. Other animal was medium length and had a white –blue /grey blotchy appearance. Thought to be a sub adult.

Table 3. Details of cetacean sighting during 2-11 April 2000 survey of the Gulf of Tonkin

Sight #	Date (Apr.)	Time	Position	Species	Group Size	Comments
1	4	13:45	19°14.39'N 107°08.69'E	Bottlenose dolphin *Tursiops* sp.	2-4-2	Appeared slightly more robust and with a shorter rostrum than *T. aduncus*. We did not get a sufficient look at the dolphins to make a positive identification to species.
2	6	15:06	17°10.49'N 107°17.59'E	Spinner dolphin *Stenella longirostris* (probably *roseiventris* subspecies)	90-60-110	Identified as dwarf spinners on the basis of small size (max. length estimated at 140cm) and abnormally large dorsal fins and flippers in comparison to body size of adult animals. Neonates present.
3	11	9:16	20°45.58'N 107°17.44'E	Indo-Pacific humpbacked dolphin	1-1-1	One adult dolphin (unspotted creamy white-pink coloration). Sighting more offshore than normal distribution.
4	11	13:32	20°43.28'N 106°55.24'E	Indo-Pacific humpbacked dolphin	2-2-2	One adult and one subadult (smaller and profusely spotted).

* Ordered according to best, high, and low estimates.

Domestication and training of dolphins

Vietnam has been attempted to domesticate and train dolphins since 1990. A preliminary work was conducted by the Vietnam-Russia Tropical Centre. They transported three bottlenose dolphins from Severtsov Institute of Ecology and Evolution, Russia to Nha Trang, Vietnam on 4-5 February 1991. At that time the dolphinarium was never built and these dolphins were remained in a small pontoon enclosure located in a small inlet near the Oceanographic Institute of Nha Trang. The result was that all three dolphins were died just after several months due to stomach diseases.

In 2000, this center re-started to transport four bottlenose dolphins from Black Sea to Ho Chi Minh City, Vietnam. Till March 2002, these dolphins were successfully domesticated in tropical water environment with temperature of about 26-28^{0}C.

After getting the success in domestication of the bottlenose dolphins come from Black Sea, the Vietnam-Russia Tropical Centre started doing several surveys to search for dolphins in the nearshore waters of Vietnam. At the beginning of 2003, they caught a couple of bottlenose dolphins *Tursiops aduncus* (identified by scientist from this center) occurred in the Kien Giang water. However, the female was then released into the sea due to unhealthiness after being caught. The male is now successfully domesticated and trained. He is now an actor in dolphin show at the Suoi Mo Dolphin Club, Ho Chi Minh City.

Presently, there are a number of dolphins caught in Vietnamese waters that are successfully domesticated and trained in artificial condition. Three of them are now kept for dolphins show at the Tuan Chau Dolphin Club, Ha Long Bay, Quang Ninh province.

Deceased cetaceans

According to internet news, fishers and local people living in the coastal areas of Vietnam have been sometimes observed the deceased cetaceans over years. The following are short descriptions of several cases that are collected from internet.

- **Deceased dolphin in Quang Ngai province:**

- Noon of 23 May 2009: one dolphin in unhealthiness condition drifted to Le Thuy beach, Binh Tri village, Binh Son district and died just after one hour. Afternoon of 24 May 2009, fishers and local people worshipped this dolphin at "whale temple". This dolphin was about 2 m long, and weight of over 500 kg, estimated by fishers. The photograph of this dolphin taken when worshipping (http://vietnamnet.vn/xahoi/2009/05/849590/)

- Afternoon 20 May 2009: another deceased dolphin found at the beach of Ky Tan l, Duc Loi village, Mo Duc district. It was about 1,5 m long and weight of about 200kg. Unfortunately that we haven't have photograph of this dolphin.

- **Deceased dolphin in Khanh Hoa province:**

1 June 2009: one alive dolphin drifted to beach of Xuan Hoa, Van Hung village. It was about 1.8m long and weight of about 90 kg. Local people waited until dolphin died then bring to "whale temple" instead of releasing it into the sea.
(http://www.mcdvietnam.org/vi-VN/News/media/tintucmcd/2009/06/Ca-heo-xuat-hien-tai-Van-Hung/204.aspx)

- **Whale occurred in the coastal waters of Quang Nam province:**

At 4PM 23 May 2009, one whale with many hurt in the body drifted to beach of Ha Binh, Binh Minh village, Thang Binh district. At 6PM in the same day, this whale was released into the see by local people. We have no picture of this whale. (http://vietnamnet.vn/xahoi/2009/05/849362/).

- **Deceased whale found in Bach Long Vi island:**

6 April 2009: one deceased whale of about 10 m long and weight of about 9-10 tones found and buried in Bach Long Vi island.
(http://www.laodong.com.vn/Home/Ca-voi-trang-dat-vao-bai-bien-Bach-Long-Vi/20094/133310.laodong)

3. Fisheries – cetacean interactions

No evidence of direct exploitation of cetacean in Vietnam. Fishers reported that they sometimes accidentally caught in gillnets, although not often. They consistently reported releasing animals that were alive when found. In practice, dolphins (as air breathing mammals) die fairly quickly from suffocation when they are caught in gillnets and preserved from reaching the surface for air. With the large number of gillnets being used along the caught of Vietnam, even a low by catch rate of dolphins could result in a significant conservation problem. One Vietnamese fisher reported that, while working as a translator for a large Chinese gillnetter, he witnessed 14-15 dolphins come

up dead in the net during a single two-week trip off the coast of Thanh Hoa province (net position: $20^0$20'N, $106^0$40'E). From the photographs, he identified the dolphins as pygmy killer whale or melon headed whales, and Risso's dolphins. He stated that the Chinese fishers sold the meat at the market in Cat Ba for 5 USD per kg. Apparently the meat of pygmy killer/melon headed whales has a strong state, and therefore does not demand a very high price (these animals were eaten by the Chinese fishers).

We also have scientific evidences to say that cetaceans can be caught by gillnets. During 1995 and 1996, the Ministry of Fisheries of Vietnam and the Japan International Cooperation Agency conducted a study of marine resources in the offshore waters of Vietnam exceeding 40m in depth. A major component of the at-sea portion of the study was an investigation of the relative abundance of "large-sized pelagic resources within the Vietnam Exclusive Economic Zone" (Fuyo Ocean Development & Engineering, 1997). The study area extended from 8° to 18° north latitude and as far as 113° east longitude, and was divided into one-degree latitudinal and longitudinal quadrangles. The study consisted of two phases:

Phase one: A surface gillnet, five km long and 10 m deep, consisting of five panels of equal length and mesh sizes of 77 mm, 95 mm, 123 mm, 150 mm, and 160 mm, respectively, was set in the middle of each quadrangle from sunset to sunrise.

Phase two: A surface gillnet, 4.5 km long and 10 m deep, consisting of six panels of equal length with the same mesh sizes as the first phase, but with an additional one having a 100 mm mesh size, was set in the middle of each quadrangle from sunset to sunrise. During the second phase a second gillnet, 750 m long and 10 m deep with a mesh size of 100 mm, was also set 10 m below the surface.

As a result, fifteen cetaceans from probably six different species were caught during the study (see Table 4). Identifications of pan-tropical spotted dolphins and pilot whales are tentative. Both these species were found in "whale temples" along the south and south-central Vietnam coast by Smith et al. (1995, 1997) and spotted dolphins were observed during our survey in the Gulf of Tonkin. Their occurrence in gillnet catches would, therefore, not be surprising. It is perhaps relevant that all cetaceans, except for one, were caught in surface gill nets with mesh-sizes of 150 mm or greater. The exception was a probable *Stenella* sp. caught in the next smaller size mesh of 123 mm. Although smaller mesh size nets may be less selective with regards to catching large-size fish, thereby possibly affecting the availability of dolphin prey, use of the larger mesh nets apparently resulted in a higher rate of cetacean mortality from accidental entanglement.

Table 4. Details of cetaceans caught during marine resources study

No.	Date	Species	Count	Position	Mesh Size (mm)	Comments
1	13/5/96	Striped dolphin *Stenella coeruleoalba*	2	12°29'N 111°27'E	150	Identification photo-confirmed
2	27/5/96	Fraser's dolphin *Lagenodelphis hosei*	1	8°52'N 109°27'E	150	Identification photo-confirmed. Stuffed specimen held at RIMP museum.
3	11/6/96	Pantropical spotted dolphin *Stenella attenuata* (?)	1	13°35'N 110°15'E	150	Identification tentative.
4	20/9/96	Pantropical spotted dolphin (?)	2	12°30'N 109°52'E	160	Probable mother/young pair. Identification tentative.
5	26/9/96	Pantropical spotted dolphin (?)	1	11°25'N 110°10'E	160	Identification tentative.
6	27/9/96	*Stenella* sp.	1	11°41'N 109°30'E	123	Juvenile. Identification tentative.
7	5/10/96	Pantropical spotted dolphin (?)	2	9°49'N 109°10'E	160	Both animals were neonates or juveniles. Identification tentative.
8	8/10/96	Short-finned pilot whale *Globicephala macrorhynchus* (?)	1	8°32'N 111°28'E	150	Found alive and released. Identification tentative.
9	18/10/96	Pantropical spotted dolphin (?)	1	109°40'N 14°13'E	150	Neonate or juvenile. Identification tentative.
10	31/5/97	Spinner dolphin *Stenella longirostris* (probably *longirostris* subspecies)	3	9°49'N 108°42'E	160	Identification photo-confirmed. Stuffed specimen held at RIMP museum.

5. Recommendation on the future research work on cetacean

Conserving cetaceans in areas where they occur in low densities, whether due to anthropogenic effects or limited habitat, is a challenging task. We do, therefore, recommend that information on cetaceans be collected routinely as a regular part of national fisheries and oceanographic research programmes conducted in the sea. We also suggest that a bycatch monitoring program be established at government fisheries offices in major fishing ports. This monitoring programme should document information on the number, species identification and morphometrics of cetacean carcasses brought into port by local fishers. Efforts should be also made to reduce cetacean bycatch and laws prohibiting fishing with explosives should be strictly enforced as part of an overall strategy for managing sustainable fisheries.

We especially recommend that future studies focus on the problem of incidental catch in fishing nets.

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Annex 16

Cetacean Research in Japan

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1. Introduction

Government of Japan (hereinafter referred to as "GOJ") considers that people can utilize cetacean resources within the limit of sustainability under the science-based management. GOJ assigned catch quota for some robust species and stocks which are not under the competence of the International Whaling Commission (IWC). Endangered or vulnerable species or stocks are protected by the domestic regulations (see items 2. and 3. below). In order to ensure the sustainable utilization of cetacean resources under the principle described above, research activities on cetacean resources are mainly carried out by National Research Institute of Far Seas Fisheries (hereinafter referred to as "NRIFSF"), Institute of Cetacean Research (hereinafter referred to as "ICR") and Tokyo University of Marine Science and Technology.

Those organizations are working on stock conditions, life histories and the trends in the abundance of cetaceans. These activities have contributed to comprehensive assessments at IWC Scientific Committee (hereinafter referred to as "IWC/SC"), aiming resumption of the commercial whaling. The organizations are also providing the information on cetaceans, including: 1) management of fisheries such as small-type whaling, hand-harpoon and drive fisheries for small cetaceans within the jurisdiction of GOJ, 2) conservation of cetaceans caught incidentally, and 3) development of methods for ecosystem management.

For population size estimation, sighting surveys are conducted (see also item 5). During sighting surveys, the organizations also conduct skin biopsy sampling, satellite tagging, diving data logging and so on. Life history studies are aiming to identify stocks, to estimate reproductive rates and to elucidate cetaceans' social ecology.

The organizations (ICR as a leader) conduct the second phase of the Japanese whale research program under special permit in the Antarctic (JARPA II) and the second phase of the Japanese whale research program under special permit in the western North Pacific (JARPN II). Objectives of the former program are: 1) monitoring of the Antarctic ecosystem, 2) modeling competition among whale species and future management objectives, 3) elucidation of temporal and spatial changes in stock structure, and 4) improving the management procedure for the Antarctic minke whale stocks (GOJ 2005) and those of the latter program are: 1) feeding ecology and ecosystem studies, 2) monitoring environmental pollutants in cetaceans and the marine ecosystem, and 3) elucidation of stock structure (GOJ 2000).

Latest research activities of above organizations are shown in Miyashita *et al.* (2009) and Iwasaki (2009) in detail.

2. Data availability > Species

All cetacean species existing in the Japanese waters, management/conservation structure, population size and method of assessment are listed in Table 1. Top priority species/stocks for the population assessment are the target species for present comprehensive assessment in IWC/SC and existing domestic fisheries.

Population size of each stock is estimated from sighting survey data of dedicated vehicles. Line transect sampling (Buckland *et al*. 1993) is adopted as a standard survey method. In most cases vessel is used as survey vehicles, while aircraft is suitable for particular situations such as finless porpoise. In the case of finless porpoise, its habitat is limited to the coastal waters (almost within three nautical miles from the coast) and there are many fishing gears (nets) set along the coasts. And finless porpoise seems whitish and has good contrast to sea water for the aeronautical observers.

Whale and dolphin observation spots are shown in Table 2. Those spots are relatively common spots for whale/dolphin watching/swimming. Most associations of commercial watching/swimming boat operators seem to have some guidelines for operation (e.g. not to get close to the individual within 100m radius).

In the Japanese waters, no deceased cetacean species appeared. In addition, vulnerable species such as blue and gray whales and finless porpoise are especially protected by the Act on the Protection of Fisheries Resources. In the act, it is prohibited to take, hold or sell those protected species (see also item 3).

3. Conservation issues

The following is a brief summary of the Japanese regulations on cetaceans. Directed takes of any cetaceans are prohibited unless otherwise permitted by the Minister of Agriculture, Forestry and Fisheries or governors of competent prefectures. The permit usually designates duration of itself, method of take, vessel(s) engaged, quota by species or stock, fishing season and area, and port(s) that cetaceans can be landed. The permits are mainly issued for fisheries but sometimes for scientific researches. Quota system has been established in 1993 for the Japanese small cetacean fisheries (for the present quota, see the URL of http://www.jfa.maff.go.jp/j/whale/w_document/pdf/h19_progress _report.pdf).

By-caught or stranded cetaceans shall be released as far as possible in case that they are alive. If they died before the release, their bodies can be sold or consumed provided that DNA sequences are registered to ICR. Consumption of those cetaceans as human food must be done according to food sanitation regulations.

4. Fisheries-cetacean interactions:

Splendid alfonsino, *Beryx splendens*, is valuable resource for fishermen in the central part of Japan. It is harvested with hook and line from the depth deeper than 300m around seamounts. Catch peaked in 1991 at ten thousand tons, and then decreased to six to eight thousand tons (FAJ 2007). *Beryx* fishermen claimed obstructions by small cetaceans such as stealing hooked *Beryx* or scattering *Beryx* schools after the peak year 1991. Hot interaction spot of this example is around Hachijo Island (approx. 33N, 140E) and along the coast of the Izu Peninsula (approx. 35N, 139E).

Fishery resources such as Japanese flying squid, *Todarodes pacificus*, and tunas are relatively abundant in the waters between Iki and Tsushima Islands (approx. 34N, 129E). Fishermen of Iki Island have long been claiming that small cetaceans made obstruction to fishing operations since 1960s (Ohsumi 1986). Since 1990s, interaction occurred between squid jiggers and small cetaceans. The catch of the Japanese flying squid during the period between December 2005 and March 2006 landed to Katsumoto fish market (Iki Island) is much lower than typical years
(statistics available from the URL of
http://www.marinelabo.nagasaki.nagasaki.jp/gyokaikyo/index.html).
Fishermen considered this was due to the obstruction by small cetaceans. It is also obvious that survival rate of the Japanese flying squid fluctuates drastically every year.

Fisheries Agency of Japan (FAJ) and Fisheries Research Agency (FRA) are requested to take preventive measures against the cases above, but at the present stage there are no certainly effective measures taken. Most fishermen seek for culling of the small cetaceans, while FAJ has a guideline not to issue the permission for culling. Possible measures having effects for short time are: 1) drive small cetaceans out of fishing ground by random strikes of pipes immersed into water with hammer (applied from the Japanese drive fishery), 2) underwater firecrackers, and 3) pinger generating loud supersonic waves of random frequencies (application of pingers designed for alerting small cetaceans to fishing gears to avoid entanglement. Experiments are underway).

Besides interactions described above, it is known that minke whales eat fishery resources such as Pacific saury, Alaska pollock, Japanese anchovy, Japanese sand lance, Japanese flying squid,

Pacific krill and so on (Tamura and Kato 2003). ICR has been tackling this issue within the JARPN II program.

5. Recommendation on the future research work on cetaceans

The following recommendations are based on general considerations, but not taking into account the actual situations of particular SEAFDEC member countries.

The first recommendation is to train domestic experts of cetacean researches. It is also recommended to have such candidates trained at the overseas organizations or laboratories.

Secondly, interviews with fishermen of coastal communities about season, area, frequency of encounter/interaction, possible species and so on will be very much valuable to collect useful information on existing cetaceans.

Thirdly, sighting survey is also valuable. The earlier steps will be for collecting distribution/occurrence data and later steps for estimating population size. Aerial sighting survey is effective for the coastal species if many fishing gears are set along the coast (e.g. finless porpoises in Japanese waters). In general, observers cannot detect all cetacean schools existing on the survey trackline and some experiments to estimate the detection probability are necessary. Independent observer experiment brings one resolution (Butterworth and Borchers 1988). For example, in minke whale sighting surveys, two separate booths are prepared for observers of the same vessel (communication between booths intercepted). Sighting data of two booths are compared each other and sightings are determined as sightings that both booths could detect or sightings that only one booth could detect but the other could not. Akamatsu *et al.* (2008) used acoustic survey for population estimation of riverine dolphins. Sighting and acoustic surveys can be complementary to each other for data correction if simultaneously conducted, similar to independent observer experiment.

Finally, dead specimens are valuable for cetacean biology. It will be helpful to construct the network to collect information and sample on the incidence of by-catch or stranding. Typical items for examinations on live/dead cetaceans are listed in Table 3. In addition, macroscopic observations and collecting blood and the organs of abnormal appearance will be useful for investigating unknown cause of deaths. For further analysis, trained pathologists will be necessary.

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Annex 17

Cetacean Species in the Southeast Asian Waters

Species	Cambodia	Indonesia	Malaysia	Myanmar	Philippine	Thailand	Vietnam
Suborder Odonticeti (Toothed whales, dolphins and porpoises							
Family Delphinidae							
Gray's Spinner dolphin *(Stenella longirostris)*	O	O	O	O	O	O	O
Dwarf spinner dolphin (*Stenella roseiventris)*	O	O			O		
Pantropical spotted dolphin *(Stenella attenuata)*	O	O		O	O	O	O
Striped dolphin (*Stenella coeruleoalba*)					O	O	
Fraser's dolphin *(Lagenodelphis hosei)*		O	O		O	O	
Indo-Pacific Bottlenose dolphin *(Tursiops truncates)*		O	O	O	O		O
Common Bottlenose dolphin (*Tursiops aduncus*)	O	O		O	O	O	O
Risso's dolphin *(Grampus griseus)*		O	O		O	O	O
Melon-headed whale *(Peponocephala electra)*		O			O	O	O
Pygmy killer whale *(Feresa attenuate)*		O		O	O	O	O
Short-finned pilot whale *(Globicephala macrorhynchus)*	O	O	O		O	O	O
Long-finned pilot whale *(Globicephala melaena)*		O					
False killer whale (*Pseudorca crassidens*)	O	O	O		O	O	O
Killer whale *(Orcinus orca)*		O	O		O	O	
Rough toothed dolphin *(Steno bredanensis)*		O			O	O	O

Species	Cambodia	Indonesia	Malaysia	Myanmar	Philippine	Thailand	Vietnam
Indo-Pacific Humpbacked dolphin (*Sousa chinensis*)	O	O	O	O	O	O	O
Long-beaked Common Dolphin *(Delphinus capensis)*	O					O	O
Common Dolphin (*Delphinus sp.)*		O					
Common Dolphin (*Delphinus delphis)*			O				
Irrawaddy dolphin (*Orcaella brevirostris*)	O	O	O	O	O	O	O
Family Kogiidae							
Dwarf sperm whale *(Kogia simus)*		O			O	O	O
Pygmy sperm whale (*Kogia breviceps*)			O		O	O	O
Pygmy/dwarf sperm whale (*Kogia* sp.)		O					
Family Physeteridae							
Sperm whale *(Physeter macrocephalus)*		O		O	O	O	
Sperm whale *(Physeter catodon)*			O				
Family Ziphiidae							
Blainville's beaked whale *(Mesoplodon densirostris)*					O		
Ginkgo-tooth beacked whale *(Mesoplodon ginkgodens)*						O	
Cuvier's beaked whale *(Ziphius cavirostris)*		O			O	O	
Longman's beaked whale (*Indopacetus pacificus*)				O	O		
Family : Phocoenidae							
Finless Porpoise *(Neophocaena phocaenoides*)	O	O	O	O		O	O
Suborder Mysteceti (Baleen whales)							
Family Balaenopteridae							
Humpback whale *(Megaptera novaeangliae)*			O		O		O

Species	Cambodia	Indonesia	Malaysia	Myanmar	Philippine	Thailand	Vietnam
Pygmy Bryde's whale *(Balaenoptera edeni)*	O	O	O	O	O	O	
Bryde's whale *(Balaenoptera bridei)*		O					
Fin whale (*Balaenoptera physalus*)			O	O	O	O	
Blue whale (*Balaenoptera musculus*)		O	O	O	O		
Omura's whale (*Balaenoptera omurai*)					O	O	
Sei whale *(Balaenoptera borealis)*			O				
Milke whale *(Balaenoptera acutorostrata)*			O				

Annex 18

Cetacean Conservation Measures Undertaken by the Southeast Asian Countries

Country	Cetacean conservation measures
Cambodia	1. Fisheries law: Point no.2 of article 23 clearly states that transporting, processing, buying, selling and stocking endangered fishery resources are prohibited. 2. Issued the sub-Decree on the list of Endangered Fishery Species consisted of 58 species including cetacean
Indonesia	1. Ratified CITED since 1979, its mean that agree not commerce export and import all species of cetacean and its derivate products. 2. Government Decree No7/1999, about picking of wild animals and plants species, not allow internal trade of all cetacean 3. Government Decree No. 8/1999, about wild animals and plant species exploitation, permitted only for traditional hunting namely "Barter" 4. Decree of SK. Mentan No.327/Kpts/Um/5/1978, No.716/Kpts/Um/10/1980 and Government regulation No. 60/2007, preservation of wide flora and fauna and conservation all of cetacean life in Indonesia. 5. Whale Sanctuary, entire Indian Ocean from 55°S including all seas under Indonesia's Jurisdiction has been established a the Indian Ocean Sanctuary (IOS)
Malaysia	1. Fisheries Act 1985: Aquatic mammals or turtles in Malaysia fisheries waters 1) No person shall fish for, disturb, harass, catch or take any aquatic mammals or turtle which is found beyond the jurisdiction of any state in Malaysia 2) The provision of the relevant State law shall apply in respect of aquatic mammals and turtle which are found within such jurisdiction 3) Where any aquatic manuals or turtle which is found beyond such jurisdiction is caught or taken unavoidably during fishing, such aquatic mammals or turtle shall, if it alive, be released immediately or, if it is dead, the catching or thereof shall be reported to a fisheries officer and the aquatic mammals or turtle shall be disposed of in accordance with his direction 4) Any person who contravenes subsection (1) or subsection (3) shall be guilty of an offence and shall be liable to fine not exceeding five thousand ringgit 2. Fisheries (Control of endangered species of fish) Regulation 1999 <u>Prohibition</u> 1) No person shall fish for, disturb, catch, kill, take, posses, sell,

Country	Cetacean conservation measures
	buy, export or transport any endangered species of fish specified in the Schedule except with the written permission of the Director General 2) The Director General may, in granting written permission referred to in sub regulation (1), impose any condition as he think fit. 3) Where any endangered species of fish specified in the Schedule is caught or taken unavoidably during fishing, such endangered species of fish shall, if it alive, be released immediately or, if it dead, the catching or taking thereof shall be reported to a fisheries officer and the endangered species of fish shall be disposed of in accordance with his direction. <u>Offence</u> Any person who contravenes sub regulation 2(1) or any of the condition imposed by the Director General under sub regulation 2(2) commits an offence
Myanmar	1. State Law and Order Restoration Council Law No.6/94: The Protection of Wildlife and Protected area Law issue on 8th June 1994 that in Chapter V, Article 15(a) by the Forest Department of the Ministry of Forestry issued Notification No.583/94, dated 26 October 1994 under which, the Cetaceans was listed in the "Completely Protected Animals" category 2. Establish protection area for Irrawaddy dolphin by Department of Fisheries between Mingun and Kyauk Myaung (Sagaing Division)
Philippine	National Laws 1. Republic Act 8550 (Philippine Fisheries Code of 1998), provided for the development, management and conservation of the fisheries and aquatic resources 2. Republic Act 9147 (Wildlife Resources Conservation and Protection Act), provided for the conservation of the country's wildlife resources and their habitats for sustainability. 3. Republic Act 8485 (Animal Welfare Act of 1998), provide for protection and promotion of the welfare of all animals in the Philippines 4. President Proclamation 342, declaration of Malampaya Sound as a Protected Seascape and Landscape Fishery Laws 1. Fisheries Administrative Order 185 series of 1992: ban on all dolphins 2. Fisheries Administrative Order 185-1 series of 1997: added whales and porpoises in ban 3. Fisheries Administrative 208 series of 2001: listed 20 cetacean species as "endangered" and are therefore protected by law International agreements

Country	Cetacean conservation measures
	1. Convention on the International Trade in Endanger Species of Wild Flora and Fauna (CITES) 2. Convention on Migratory Species (CMS) 3. Convention on Biological Diversity (CBD) 4. Agenda 21 (UNEP's Sustainable Development) Jurisdictional Management 1. Department of Agriculture- Bureau of Fisheries and Aquatic Resources (DA-BFAR): all declared aquatic critical habitats and all aquatic resources including but not limited to fishes, aquatic plants, invertebrate and all marine mammals except dugong 2. Department of Environment and Natural Resources Protected Areas and Wildlife Bureau (DENR-PAWB): all terrestrial plants and animals and all turtles and tortoise and wetland species waterbirds and all amphibians and dugongs
Thailand	1. Fisheries Act 1999: No one shall hunt dolphins. 2. Wildlife reservation and protection Act 1992: 10 species of cetaceans have been listed as protected animals. 3. Export and import Act 2004: No animals in order Cetacea shall be allowed to export and import.
Vietnam	Follow the international regulations in protection of the endanger species. No particular domestic regulation for cetacean like

Annex 19

Recommendations and Follow-up Actions on Cetaceans as Suggested by the Countries in Southeast Asia

Countries	Recommendation
Cambodia	1. Further surveys concentrating on the inshore water along the whole coastline of Cambodia. 2. More survey on Dugong concentrating at the sea grass areas of Kampot and Chroy Pras in Kong Kong as previous aerial survey was at the time of low tide and Dugong used to be caught in surrounding nets there. 3. Mekong dolphin necropsy project needs more investigation in order to obtain better scientific information on the causes of death, particularly the calves. 4. More strengthening on the Cambodia – Vietnam marine fisheries trans-boundary management committee and urgently need to establish Cambodian-Thai marine fisheries trans-boundary management committee.
Laos	1. Joint population monitoring using photo-ID technique 2. Establish local mortality reporting network 3. Establish dolphin movement reporting network e.g. calendar 4. Site status assessment: socio-economic and ecological conditions; identification of current threats; identify local issues; identify key community, Government and business stakeholders 5. Fish catch monitoring 6. Joint monitoring of water quality 7. Evaluate impact of tourism and boat traffic on dolphins
Indonesia	1. Additional field data (independent on-board observers in fisheries likely to experience significant cetacean interaction) 2. Reporting of cetacean by-catch rates and cetacean standings where a fishery interaction is likely to have been involved (i.e. net or line entanglements) 3. Monitoring of fishing areas with high cetacean diversity/abundance (such as the Flores and Banda Sea) 4. Ecological research on cetacean species known or suspected to be involved in depredation. 5. Improved management for cetaceans inhabiting the Bali-Lombok Strait region. This area has a relatively high cetacean diversity and abundance when compared to most other areas in eastern Indonesia. In addition, the waters to the south off Bali have been established as one of Indonesia's prime cetacean habitats where whale and dolphin watching is possible on a daily and year-round basis. 6. Lovina areas (north Bali) can serve as a good example of how community-based dolphin watching industry can strive for sustainable practices through extensive research, good and regular communications, government assistance, and practical best practice trainings. 7. Research an assessment of cetacean – fisheries interaction in Solor-Alor, Kalimanatan, Sulawesi, East Nusa Tengga, Bali and Papua regions. 8. Research an assessment population size of cetacean. 9. Monitoring regularly of cetacean habitat related with the global exchanges issues. 10. Future survey effort should focus particularly on the Berau Archipelago and involve investigating at which areas have a year-round or seasonal

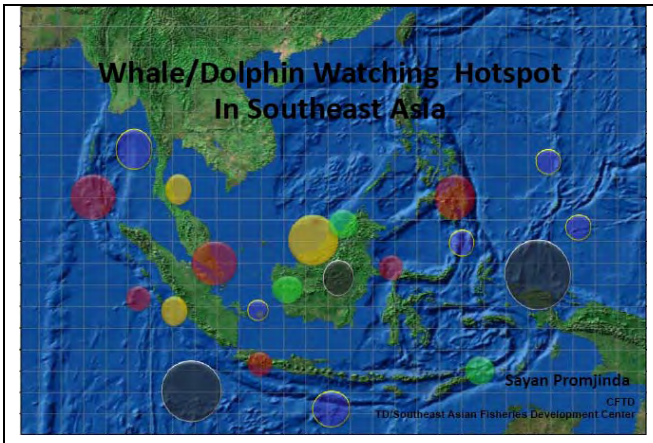
Countries	Recommendation
	importance for all target species and relating this to ecological and bio-geographical factors. 11. Cause of habitat degradation of Irrawaddy dolphins (Mahakam fresh water dolphins), so need the research of habitat quality monitoring and fisheries interaction.
Malaysia	1. Study the status of marine mammals management in Malaysia 2. Identify hotspots for marine mammals distribution based on records of sightings and stranding reports. 3. Develop specific management plans for conservation 4. Recommend marine protected area for marine mammals based on updated information on species composition and distribution, create public awareness campaigns and other education tools 5. Initiate ecotourism marketing campaigns and International coordination on management issues
The Philippines	1. Focus on the Specific areas of research that needs to be conducted based on Report of the Second Workshop on the Biology and Conservation of Small Cetaceans and Dugongs in Southeast Asia (Perrin et al., 2005) 2. To conduct of broad-scale survey of the remaining undocumented 60% of Philippine waters for cetaceans. A joint marine mammal survey proposal of the Sulawesi Sea among the countries of Indonesia, Malaysia and the Philippines has been endorsed by the Sub-Committee on Species of the Tri-National Committee of the Sulu-Sulawesi Marine Ecoregion or SSME.
Myanmar	1) To conduct on the occurrence and distribution of cetaceans along the coastal area of Myanmar. 2) To investigate the extent of incidental takes of dolphins in fishing nets and 3) To assess the effects of offshore exploration and drilling for oil and natural gas. 4) To conserve and protect the endangered cetacean species along the coastal area of Myanmar. 5) To conduct scientifically survey for the distribution and abundance of coastal area of Myanmar. 6) To promote collaboration workshop and collaboration survey with other international scientists, organizations, and institutions, who conserve survey, research and conservation of endangered cetacean species. 7) To educate the local fishermen, the fisheries officer who stationed along the coastal area, the knowledge of cetaceans, regional and internationally prohibited for killing, hunting and selling. 8) To prohibit the fishing grounds and fishing gears and techniques, to conserve the cetacean species which habitat along the coastal area of Myanmar. 9) To propose research grant and funding from international organizations, institutions and NGOs for the purpose of the conservation survey and management of cetaceans, along the coastal area of Myanmar. 10) To be establishing research station to collect the baseline information along the coastal area of Myanmar.
Thailand	1) Intensive cetacean researches are needed in all aspects. The future research should include biological study of the cetacean, migration pattern of cetacean found in Thailand and the impact of the fisheries on cetacean. All of these information are vital for establishing proper regulations for cetacean conservation.
Vietnam	1) Information on cetaceans be collected routinely as a regular part of national fisheries and oceanographic research programmes conducted in the sea. 2) Bycatch monitoring program be established at government fisheries offices in

Countries	Recommendation
	major fishing ports. This monitoring programme should document information on the number, species identification and morphometrics of cetacean carcasses brought into port by local fishers. 3) Efforts should be also made to reduce cetacean bycatch and laws prohibiting fishing with explosives should be strictly enforced as part of an overall strategy for managing sustainable fisheries. 4) Future studies focus on the problem of incidental catch in fishing nets.
Japan	1) Enhancing of human capacity: To train domestic experts of cetacean researches. It is also recommended to have such candidates trained at the overseas organizations or laboratories 2) Interviews with fishermen of coastal communities about season, area, frequency of encounter/interaction, possible species and so on will be very much valuable to collect useful information on existing cetaceans. 3) Conducting the sighting survey is also valuable. The earlier steps will be for collecting distribution/occurrence data and later steps for estimating population size. Aerial sighting survey is effective for the coastal species if many fishing gears are set along the coast (e.g. finless porpoises in Japanese waters). In general, observers cannot detect all cetacean schools existing on the survey trackline and some experiments to estimate the detection probability are necessary. Independent observer experiment brings one resolution (Butterworth and Borchers 1988). For example, in minke whale sighting surveys, two separate booths are prepared for observers of the same vessel (communication between booths intercepted). Sighting data of two booths are compared each other and sightings are determined as sightings that both booths could detect or sightings that only one booth could detect but the other could not. Akamatsu et al. (2008) used acoustic survey for population estimation of riverine dolphins. Sighting and acoustic surveys can be complementary to each other for data correction if simultaneously conducted, similar to independent observer experiment. 4) Dead specimens are valuable for cetacean biology. It will be helpful to construct the network to collect information and sample on the incidence of by-catch or stranding.

Whale and Dolphin Watching/Sighting Hotspots in the Southeast Asian Waters

By Mr. Sayan Promjinda

Fishing gear technologist, Capture Fishery Technology Division, SEAFDEC/TD



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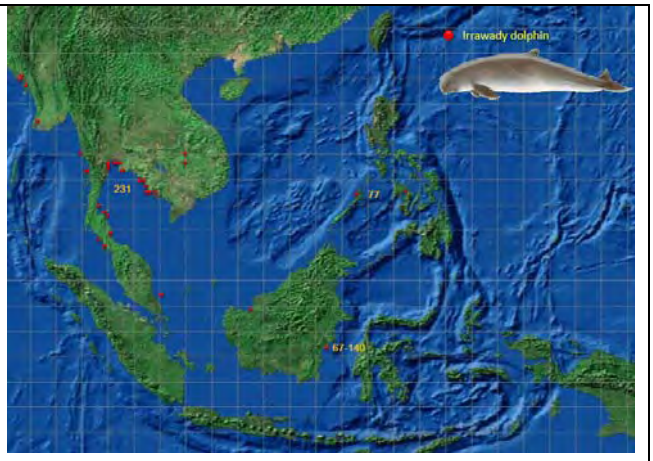

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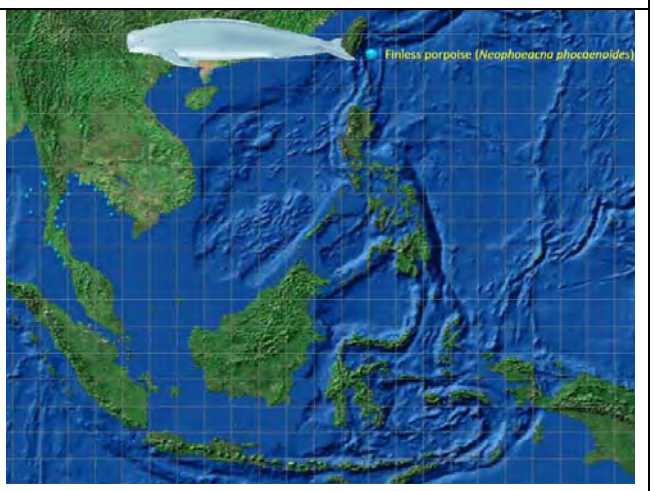

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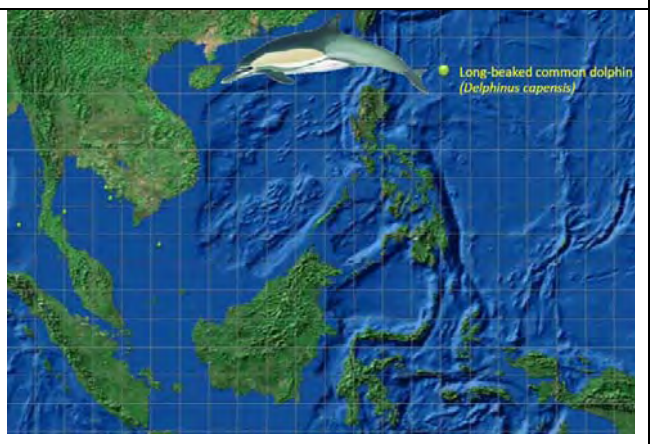

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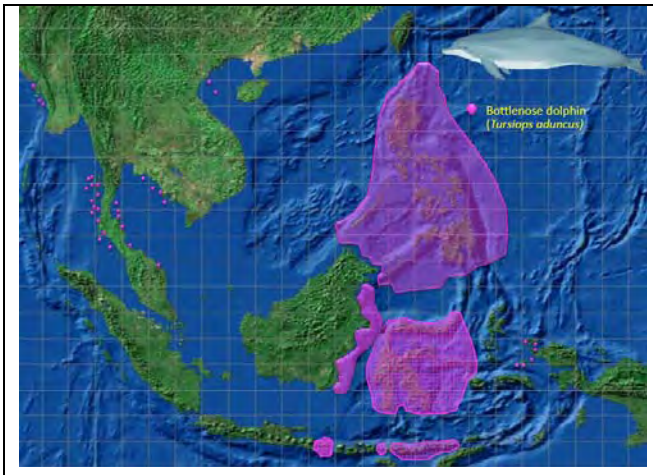
Bottlenose dolphin
(Tursiops aduncus)

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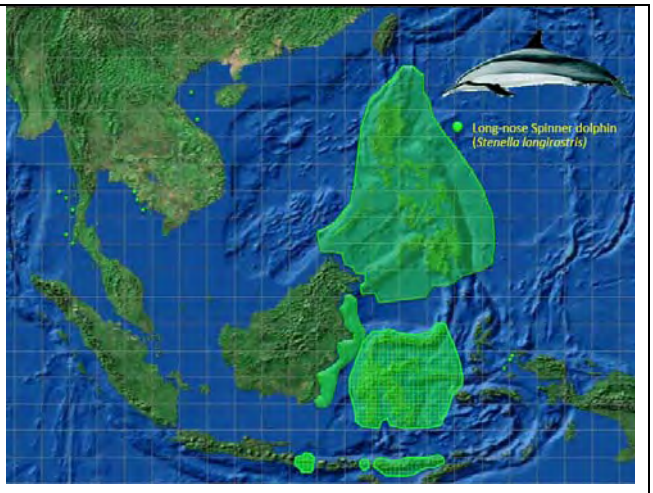
Long-nose Spinner dolphin
(Stenella longirostris)

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False killer whale

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Spotted dolphin
(Stenella atenuata)

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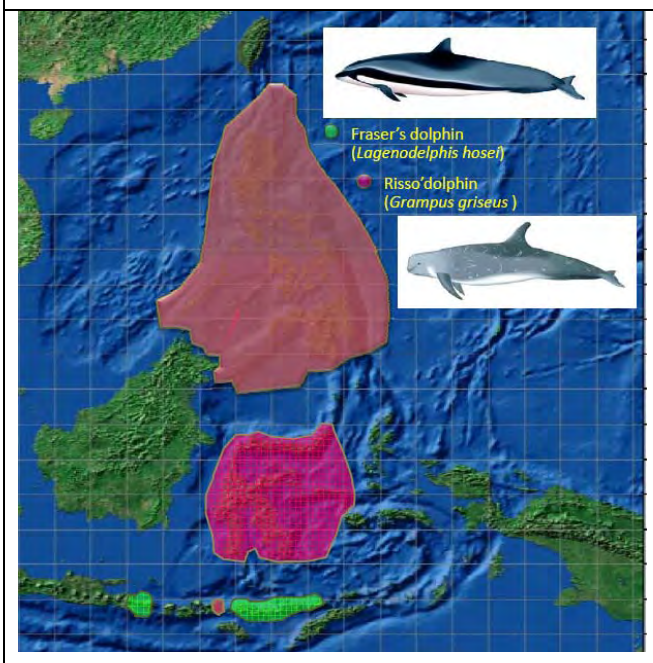
Fraser's dolphin
(Lagenodelphis hosei)
Risso'dolphin
(Grampus griseus)

11


Pygmy sperm whale
(Kogia sp.)

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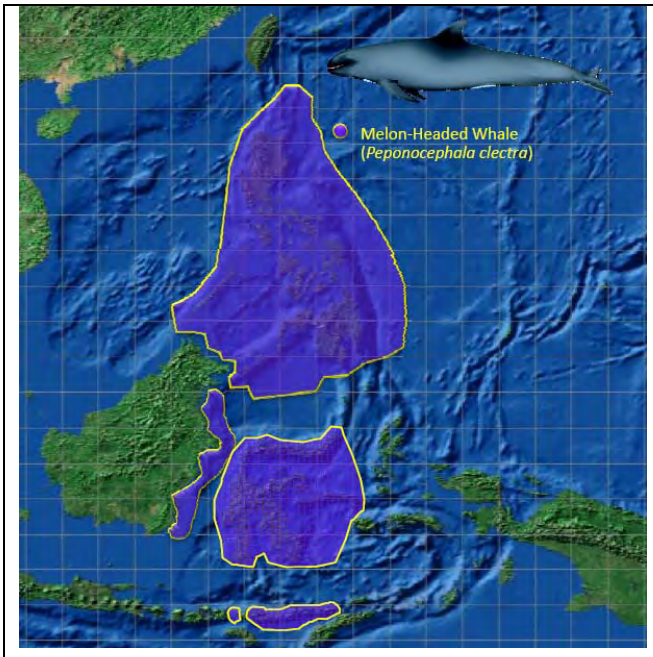

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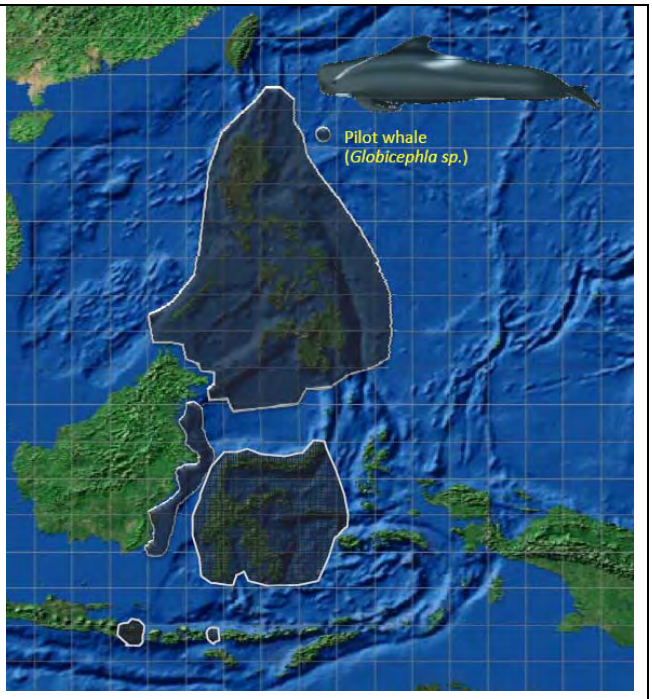

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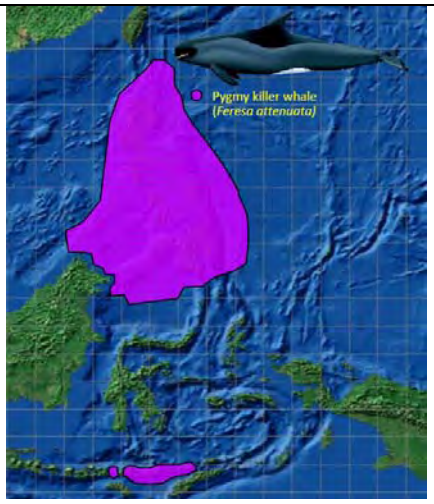

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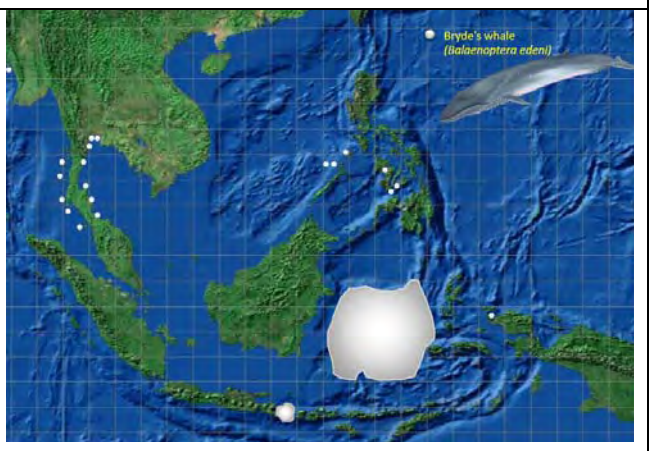

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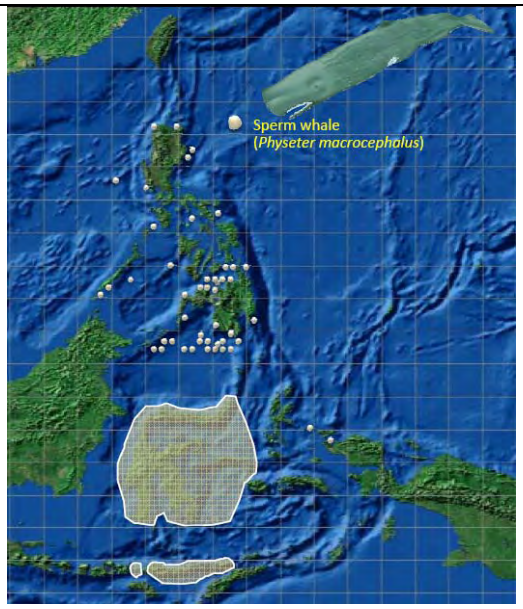

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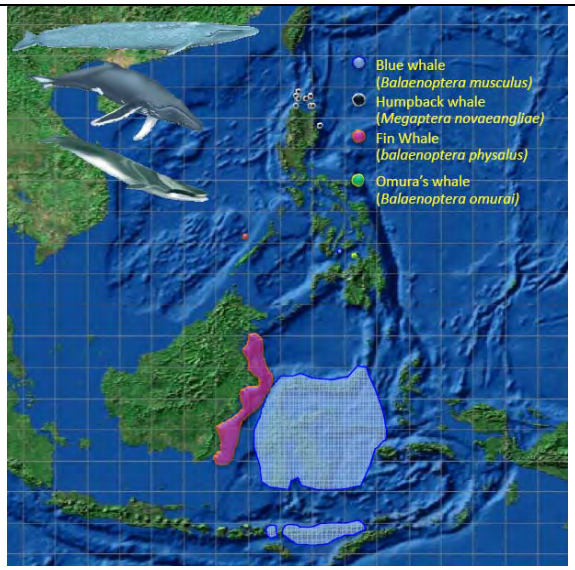

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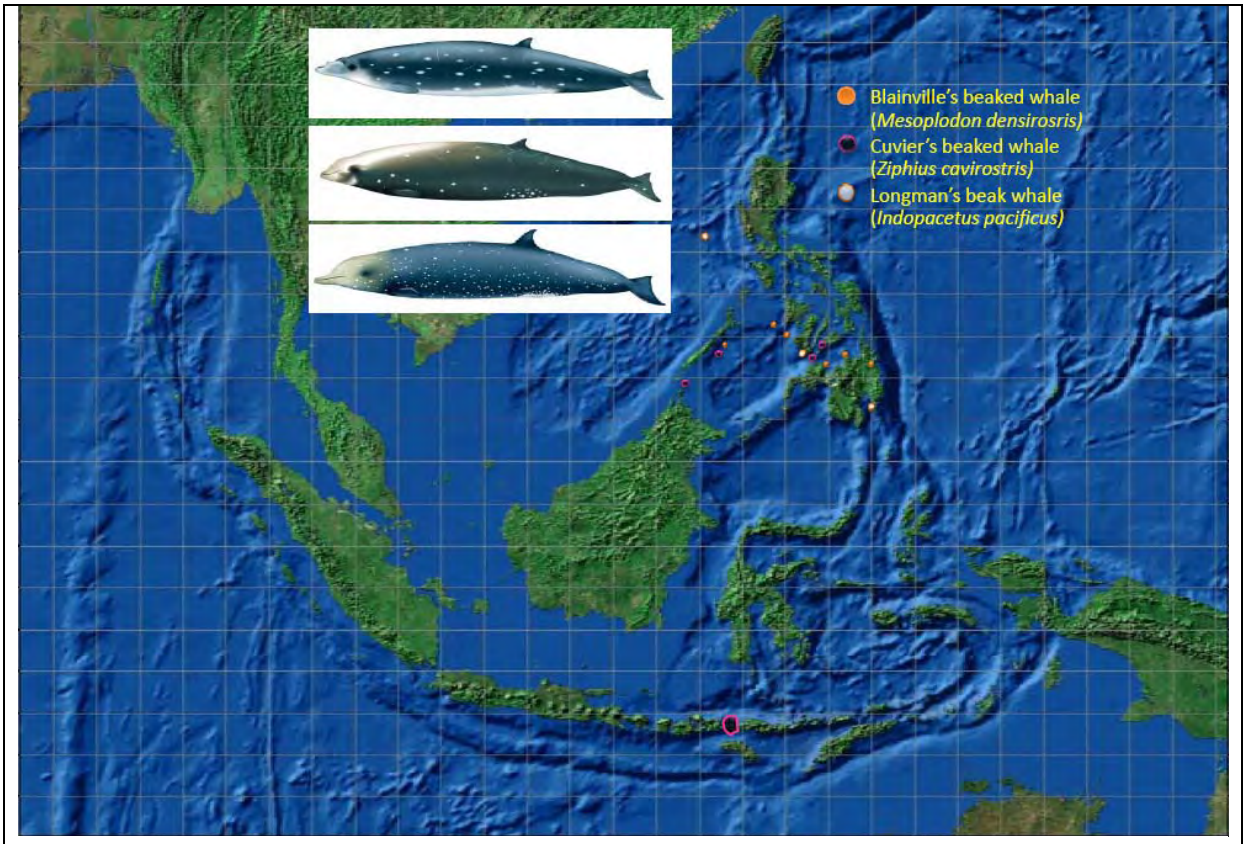
Blainville's beaked whale
(Mesoplodon densirosris)
Cuvier's beaked whale
(Ziphius cavirostris)
Longman's beak whale
(Indopacetus pacificus)

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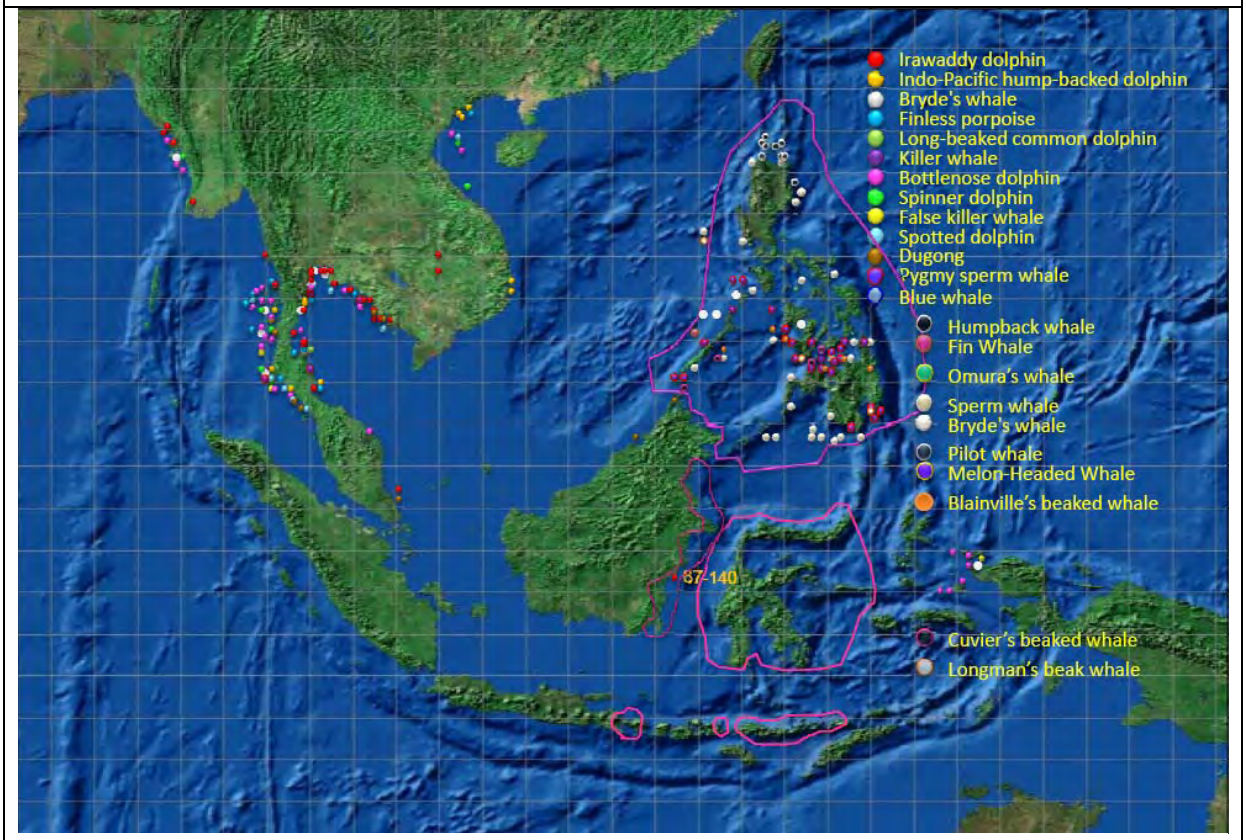
Irawaddy dolphin
Indo-Pacific hump-backed dolphin
Bryde's whale
Finless porpoise
Long-beaked common dolphin
Killer whale
Bottlenose dolphin
Spinner dolphin
False killer whale
Spotted dolphin
Dugong
Pygmy sperm whale
Blue whale
Humpback whale
Fin Whale
Omura's whale
Sperm whale
Bryde's whale
Pilot whale
Melon-Headed Whale
Blainville's beaked whale
87-140
Cuvier's beaked whale
Longman's beak whale

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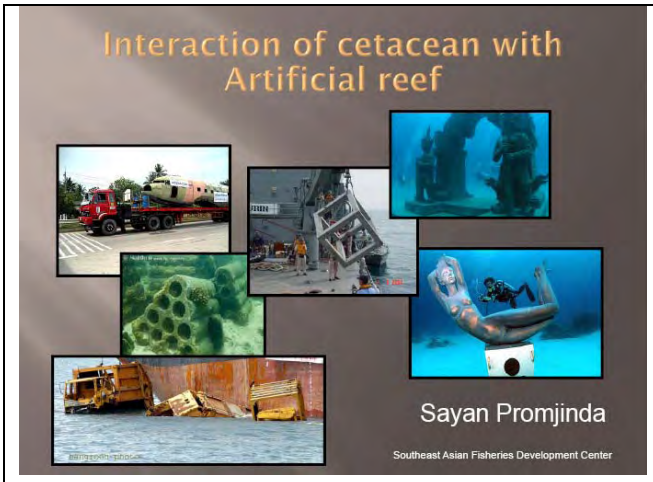
Annex 21

Interaction of Cetacean with Artificial Reef

By Mr. Sayan Promjinda

Fishing gear technologist, Capture Fishery Technology Division, SEAFDEC/TD



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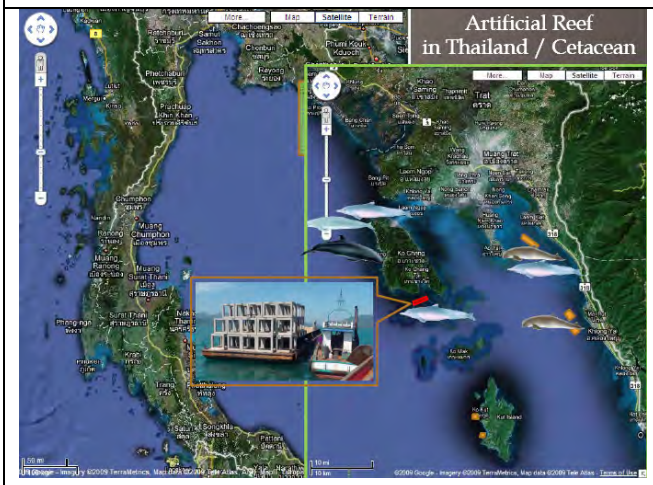

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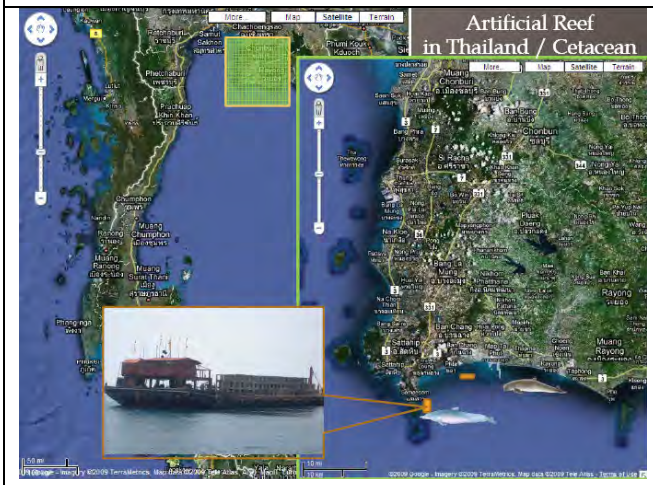

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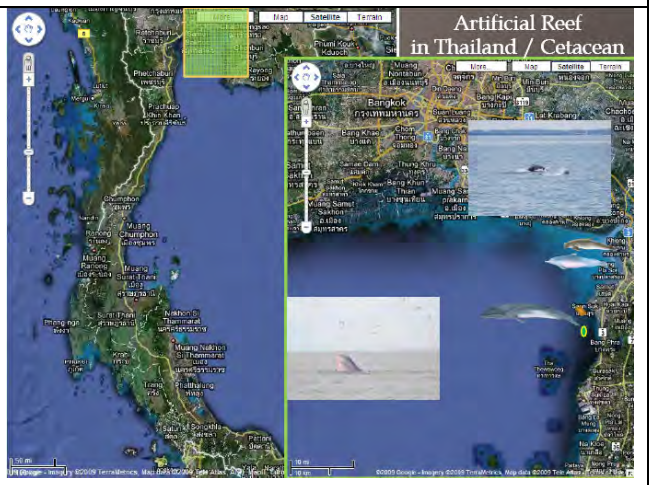

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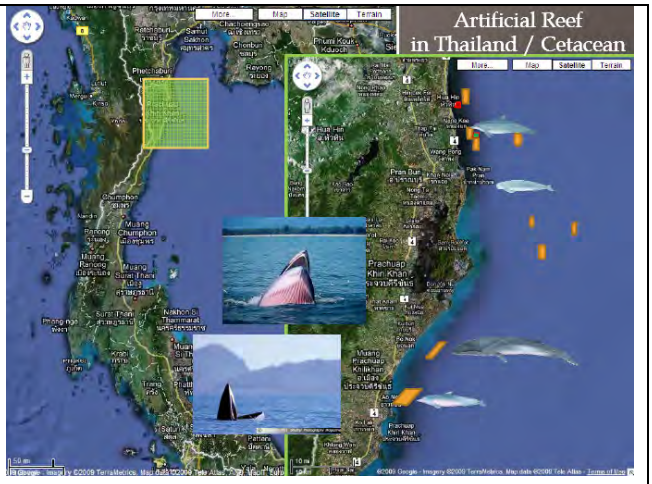
Artificial Reef
in Thailand / Cetacean

7


Artificial Reef
in Thailand / Cetacean

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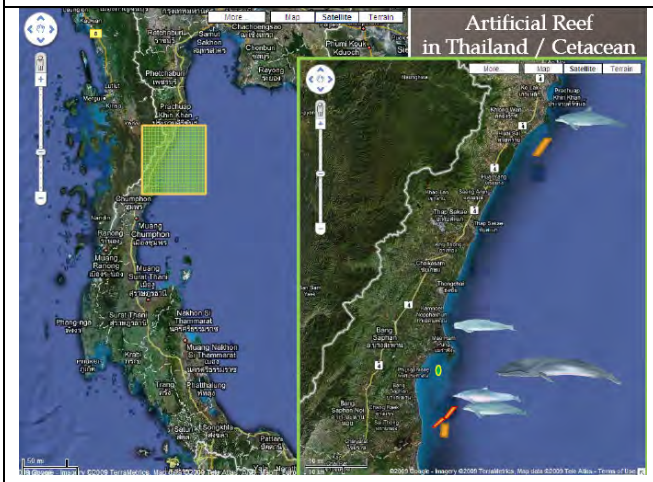
Artificial Reef
in Thailand / Cetacean

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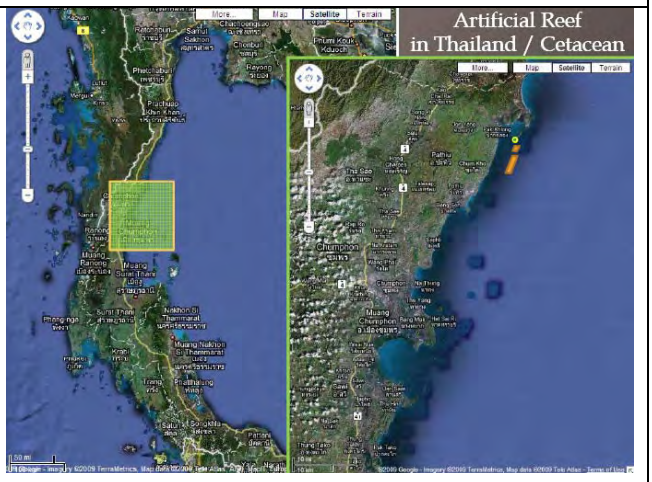
Artificial Reef
in Thailand / Cetacean

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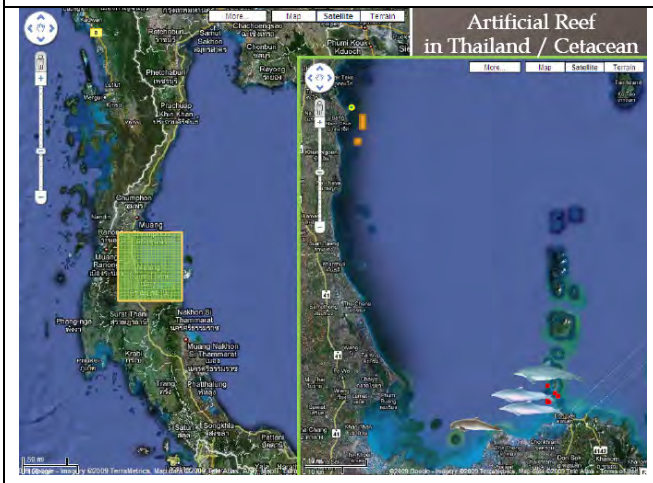
Artificial Reef
in Thailand / Cetacean

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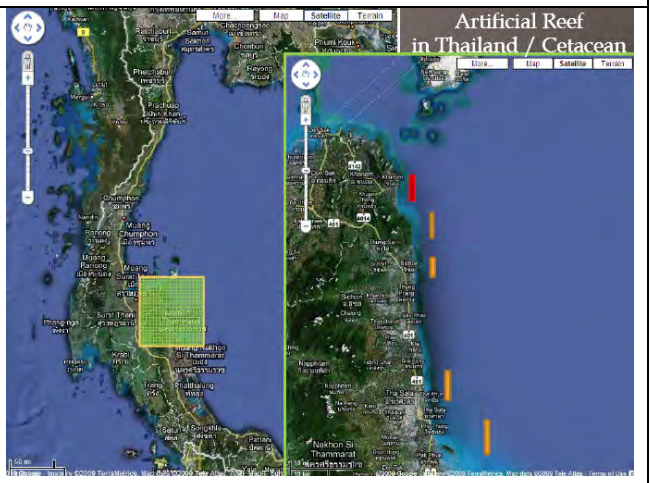
Artificial Reef
in Thailand / Cetacean

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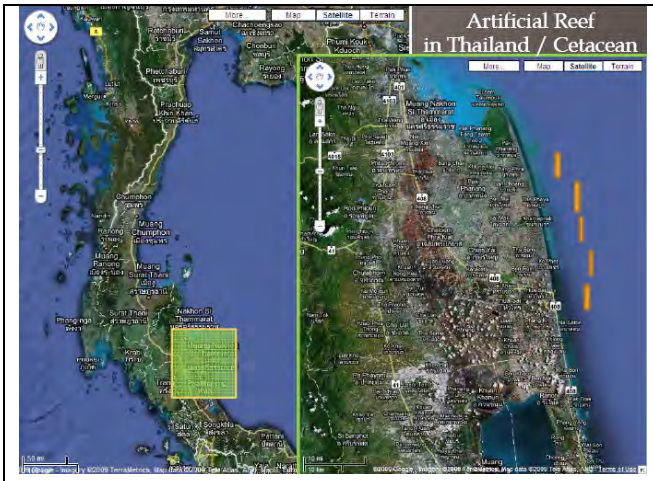

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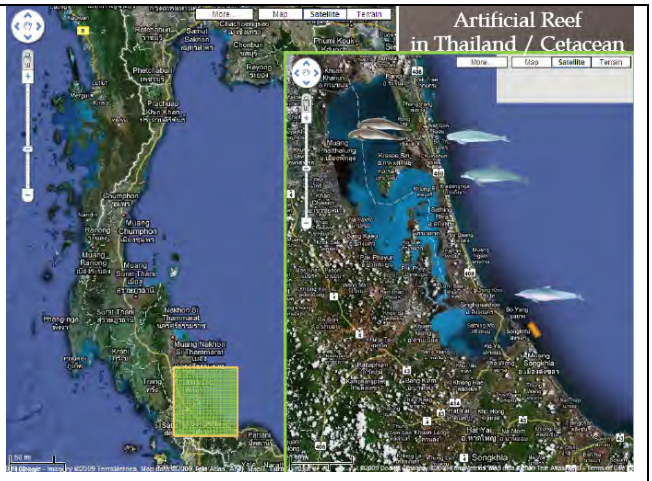

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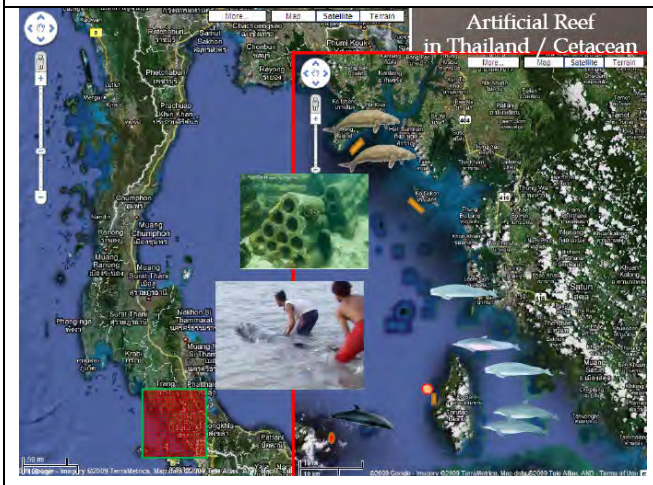

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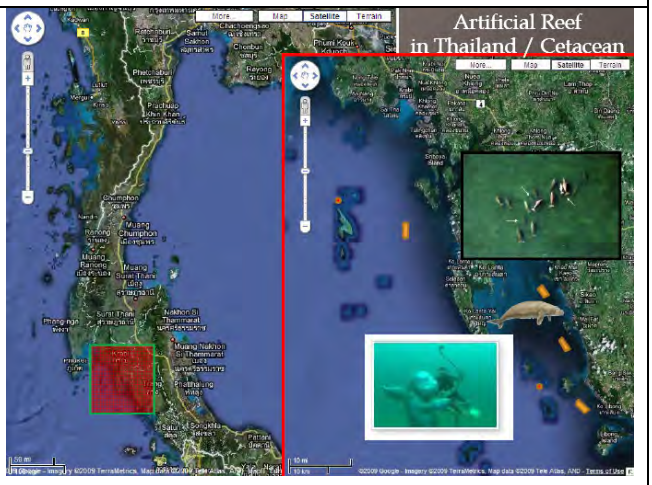

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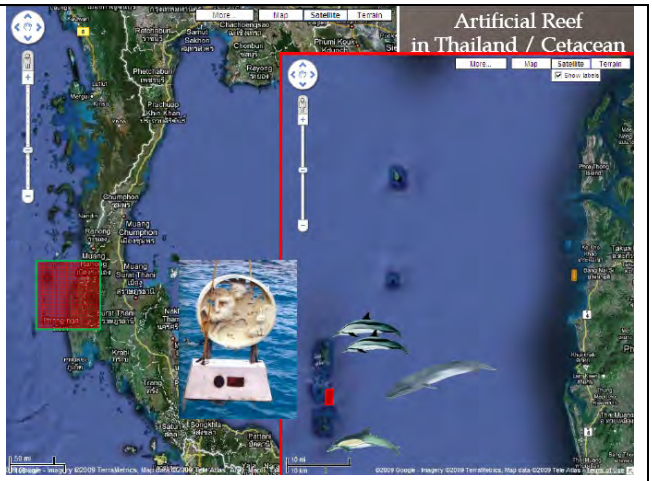

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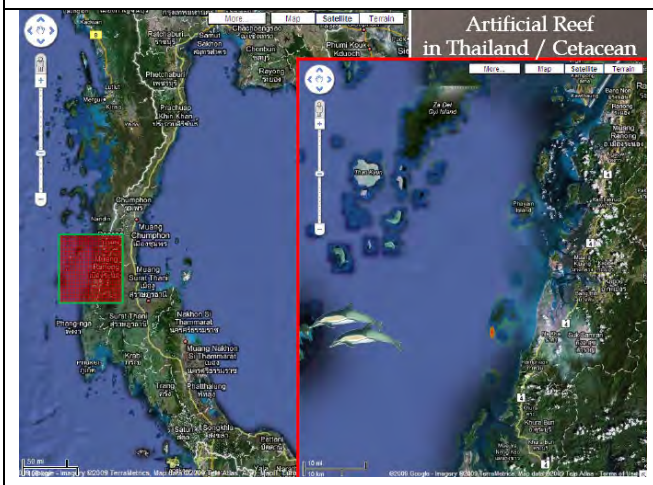

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Discussion

- - why cetaceans come to ARS ? Feeding / living
- Cetaceans feed in not enough in deep sea area ?
- If cetaceans come for feed, it will decrease the fisheries resource / or not ?
- Are cetaceans scramble fisheries resource with Human ?

22

Cambodian Mekong Dolphin Conservation Project

Mr. Phay Somany , Deputy Director of Fisheries Conservation Department,

Fishery Administration of Cambodia , phaysomany@yahoo.com

WWF for a living planet

Cambodian Mekong Dolphin Conservation Project

Phay Somany

Fisheries Administration Of Cambodia

1

WWF for a living planet

Introduction

- The Cambodian Fisheries Administration (FiA) began research on Mekong River dolphins in January 2001, in collaboration with James Cook University and Wildlife Conservation Society (WCS). Result = development of the Cambodian Mekong Dolphin Conservation Strategy in 2005
- CMDCP was formed in July 2005 as a collaborative project between WWF, WCS, CRDT and the FiA
- CMDCP aim: implement the Government's 2005 Mekong dolphin conservation strategy
- Cambodian Fishery law provides full protection status to the Mekong dolphin

2

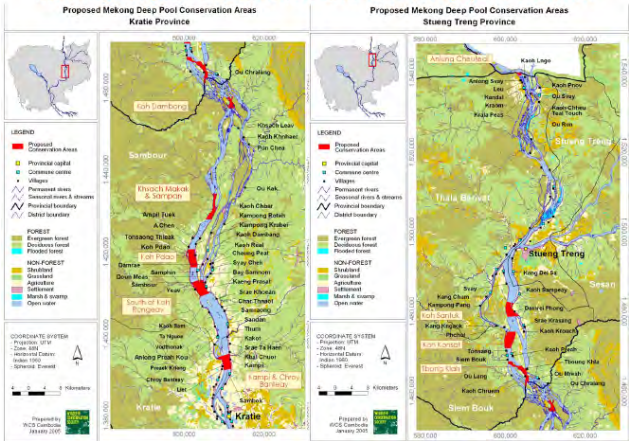
WWF

- Due to the continuing high Mekong dolphin mortality rate the Cambodian Government established the Commission of Dolphin Conservation and Ecotourism Development (DC) in 2006
- Following a series of meetings between the DC, FiA and CMDCP it was decided that:

DC would focus on enforcement and ecotourism development issues, while CMDCP would focus on awareness, research, alternative livelihoods and provide technical input on conservation issues.

3

Mekong dolphin distribution and core deep pool habitats



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Threats

Average annual minimum mortality = 16 dolphins over last 5 years

Estimated Mekong population abundance in 2007 = 71

Direct threats:
- gillnet bycatch
- targeted human killing

Indirect threats:
- pollution
- overfishing
- illegal fishing
- boat traffic
- poorly planned tourism
- disease

Potential threats:
- Development projects

5

WWF

CMDCP core activities to date

Research
- mortalities - necropsies and diagnostic work on tissue samples
- population & distribution - using photo-identification technique
- monitoring threats - patrols, water quality monitoring, dolphin behaviour monitoring in presence of human activities

Conservation
- identification and demarcation of core dolphin habitat
- joint stakeholder patrols
- guidelines for dolphin ecotourism
- new legislation & regulations campaigning

6



Awareness

- provincial: schools, villages, monks, government and fishermen
- international: tourists and public
- national: government and the general public

Livelihoods and community development

- ecotourism
- aquaculture and new agricultural products
- improved agricultural techniques
- clean water and sanitation



7

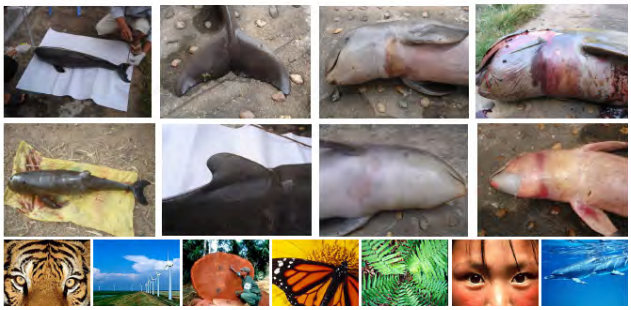
Key issues

- high calf mortality - 85% of all mortalities in last 2 years
- trans-boundary complexity
- mysterious low birth rate in 2008
- community participation – lack of consultation and involvement of communities in government management and inequitable ecotourism benefit sharing
- The bans gillnets throughout dolphin range

8

INVESTIGATION OF THE DEATH CAUSES

NECROPSY EXAMINATION



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NECROPSY EXAMINATION



10

Success stories

- Decline in adult mortality
- Strong research programme established
- Kampi dolphin ecotourism is relatively well managed and generating increasing funds for government and certain community members
- Successful implementation of alternative livelihood and sanitation projects at villages located in core dolphin areas
- High awareness of Mekong dolphin mortality issue locally and nationally - attracted media and government attention

11

Lessons learned

- Need to work with other relevant government agencies to ensure ALL stakeholders participate in decision making and management, particularly at community level
- Require socio-economic understanding of communities impacting dolphins to ensure appropriate and measurable conservation activities
- Importance of the need of clear regulations that are properly disseminated for the protection of dolphins and their habitat
- Importance of providing viable alternatives to gillnet fishing

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Annex 23

Aquatic Resources Management and Conservation of the Critically Endangered Mekong Irrawaddy Dolphin, *Orcaella brevirostris*

Mr. Akane Phomsouvanh, Head of Fisheries Management Unit , Department of Livestock and Fisheries, akhanep@yahoo.com

Aquatic Resources Management and Conservation of the Critically Endangered Mekong Irrawaddy Dolphin, *Orcaella brevirostris in Lao P.D.R*

Akhane Phomsouvanh,
Head of Fisheries Management Unit,
Fisheries Division,
Department Of Livestock and Fisheries

1

Introduction

- In 1993 The FCZ at Ban Hang Khon was firstly established by the support from a former project on dolphin protection.
- The village rules were also developed for the regulation of fishing activities.
- 2008, Aquatic Resources Management and Conservation of the Critically Endangered Mekong Irrawaddy Dolphin, *Orcaella brevirostris*

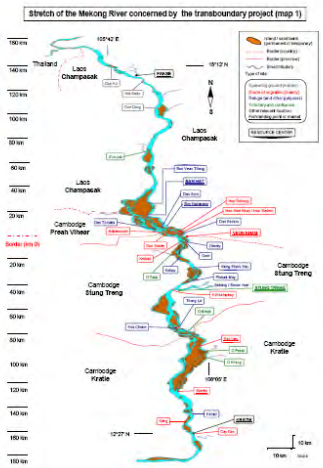
2

Objectives

- To assess local community livelihood development through improving management of wetland resources at the Transboundary Pool, especially wild capture fisheries & dolphin conservation and associated tourism
- To strengthen cooperation between Lao and Cambodia for the management of aquatic resources at the transboundary pool
- To propose conservation solution for the last population of Irrawaddy Dolphin (*Orcaella brevirostris*)

3

Transboundary Deep Pool Management



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Issues that impact upon the dolphin pool (1)

- Fishery management: The use of illegal methods (electricity, poisons, explosives) and the placing of gill nets in the deep pool and in areas where the dolphins feed, in addition to the overall increased fishing pressure, that reduces the available prey fish for the dolphins.
- Tourism: The distribution of income from this activity and the problems caused by boat engines.

5

Issues that impact upon the dolphin pool (2)

- Co-ordination of efforts to conserve the dolphins: this is lacking both inside countries and between them.
- The need for alternative livelihoods: if fishing is to be reduced, as it must be, then there have to be alternative ways found for villagers, especially the poorest, to make a living.

6

Recommendation on the future research work

- Joint population monitoring using photo-ID technique
- Establish local mortality reporting network
- Establish dolphin movement reporting network e.g. calendar
- Site status assessment: socio-economic and ecological conditions; identification of current threats; identify local issues; identify key community, Government and business stakeholders
- Fish catch monitoring
- Joint monitoring of water quality
- Evaluate impact of tourism and boat traffic on dolphins

7

TBP Management

- Establish a Cambodian-Laos TBP management committee representing community, business, NGO and Government stakeholders.
- Establish a Cambodian-Laos TBP management committee representing community, business, NGO and Government stakeholders.
- Committee develops a zonal resource use plan with regulations for the TBP: 1) conservation area – no gill nets, boat traffic speed limits; 2) multiple use zone.
- Establish participatory mechanisms to enforce regulations of zonal use system.
- Encourage establishment of community fishery resource management in the area.
- Develop mechanisms for equitable cost-benefit sharing between stakeholders.

8

Thanks you ....

9

Annex 24

Future Cetacean Research Program in Southeast Asia

Recommendations for future cetacean research program in SEA region

Future cetacean activity/program in SEA – 1

Issue/Subject	Regional	National	Local
Research for action	Yes	Yes	Yes
Set of Guidebooks (sighting survey, species identification, abundance estimation, rescue, ?	Yes	Yes	Yes
Capacity building program for monitoring and assessment		Yes	
By-catch (joint) monitoring program (gillnet)		Yes	Yes
Information exchange mechanism	Yes	Yes	Yes
Information dissemination (list, map of species)	Yes		
Coastal/river rehabilitation program		Yes	Yes
Participatory approach for C-CM		Yes	Yes

Future cetacean activity/program in SEA – 2

Issue/Subject	Regional	National	Local
Establishment of CPA in coastline and river		Yes	Yes
Incorporate CMS 's outputs into the result of this RW on missing element	Yes		

Recommendations on Cetacean Research in the Region

1) Capacity building on Cetacean Research including sighting and abundance surveys, biological studies and laboratory works as well as on the estimation of cetacean population using established methods and DNA analysis, provide training course on the survey techniques including also skull morphology for species identification.
2) Interviews studies with fishermen in coastal communities about season, area, frequency of encounter/interaction, possible species, among others.
3) Assessment studies on Cetacean species through joint surveys for Cetaceans in the EEZ and sub-regional areas and at national, bilateral and tri-lateral levels such as in the Sulu-Sulawesi sub-region, Gulf of Thailand, the Andaman Sea.
4) Improvement and appropriate modification of fishing gears and practices to mitigate Cetacean by-catch(e.g. reduction of cetacean gillnet by-catch)
5) Establishment of trans-boundary fisheries aquatic management committee to strengthening the trans-boundary management systems
6) Based on updated information on species composition and distribution, create public awareness campaigns and other education tools to conserve the Cetacean Habitat.
7) Promotion of **ecotourism** based on the cetacean hot-spots information.

8) Establishment and/or Strengthening national information collection through collaboration with national/local networks

9) Establishment of cetacean rescue programs/network.

10) Assessment of the interactions between cetaceans and fisheries resources, focusing on the impacts to the fisheries habitats as well as promoting scientific-based management of the cetaceans

Annex 25

CLOSING REMARKS

by Mr. Hideki Tsubata

SEAFDEC Deputy Secretary-General and Trust Fund Program Manager

The 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters
At SEAFDEC/TD
31 July 2009

Ladies and Gentlemen, good afternoon!

First of all, I wish to inform you that I am very happy to note the success of this 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Waters. I have observed from the presentations that the countries in the region have conducted cetacean research activities but on varying degrees of implementation. Some countries have already gone a long way while some countries have just started. In spite of such time line differences, I am impressed that the Workshop was able to come to a conclusion on the future plans for the cetacean research that would be beneficial to the countries in this region.

The information that the countries have provided on the extent and findings of their cetacean research would be very useful for the inventory that SEAFDEC is trying to establish on the cetacean species found in this region and most especially the whale and dolphin hotspots in the waters of this region. From such valuable information, we hope to also assess the interaction of the large cetaceans to the region's coastal resources and habitats, considering the frequent stranding of large cetaceans in the coastal areas of this region.

Since we have accomplished our objectives of this Workshop and for your efforts, I would like to congratulate all of you for making this workshop successful. Thank you very much indeed for your cooperation and support.

Lastly, I look forward to the realization of the future program on cetacean research to assist the countries in the region. Please be also assured that we at SEAFDEC would find ways and means to enhance our cetacean sighting program and share the outcomes with the Member Countries.

With that brief remarks, I now declare this 1st Regional Workshop closed. Thank you again, and hope you will have safe journey back to your families and loved ones.

Good day!