

Chapter 5

Conclusions and Recommendations

Conclusions

1. One species of porpoise *Neophocaena phocaenoides* (finless porpoise) and three species of dolphins *Orcaella brevirostris* (Irrawaddy dolphin), *Sousa chinensis* (Indo-Pacific humpback dolphin) and *Tursiops truncatus* (bottlenose dolphin) were found in the Inner Gulf of Thailand. Although there was no new specimens of *T. truncatus* available for studied but this species was very commonly seen by most people in the study area. *S. longirostris* seemed to have very small population if still remaining in the Inner Gulf of Thailand because very few people reported in sighting.

2. *N. phocaenoides* distributed somewhat off the coast, not too much in the northern area and preferred the depth of about 10-15 m.. It was found along the coast except for Pattaya and lower part of the east coast. Many records on the east coast come from Ang-sila, Kao Sammhuk and Vornapa. On the west coast most carcasses were taken from Had Chao and Cha-am. Finless porpoise is not widely distributed but highest records of entanglement occurred in this species.

3. *O. brevirostris* inhabited close to the shore in the shallow water of about 1.5 m depth particularly at the northern end around the river mouths. Not so many people reported seeing this species on the lower part of the west coast and it was absent from Pattaya and the lower part of the east coast. Most local people reported to be friendly with Irrawaddy dolphin.

4. *S. chinensis* was encountered by many people along the coast. It was commonly found almost in all estuaries although it could infrequently be seen offshore to about 20 m depth. Most fishermen believed that this dolphin was the animal of the angle and they did not harm this dolphin although it was sometimes shot when it robbed some caught fish from the net.

5. *T. truncatus* was reported to be often seen offshore, particularly around the islands but it could sometimes be seen approached the coast as well. There are rich populations around the lower part of the east coast. This species was not reported to be entangled in the study area.

6. Only Chao Phraya and Bang Pakong River were found to be deeply intruded by dolphins. In Chao Phraya, intrusion of *O. brevirostris* were recorded about 30 years ago to be up to at Ko Kret, 85 km from estuary and in Bang Pakong they were commonly seen up to 60 km from the river mouth. *T. truncatus* were surprisingly found to be up to only about 30 km from the Chao Phraya river mouth. *S. chinensis* has still been reported to go into every rivers but to only few km.

7. The commonly entangled species is *N. phocaenoides*, finless porpoise. The skull of physically mature male, MSCU001, in this study has smallest CBL than those of Indian ocean, Yangtze river and Japan. August is in the lactation period of the female of this species but the whole period is still unknown. The trachea of finless porpoise is inside divided into double trachea which never been reported earlier. The frequent reports of incidental catches of this species is causing worry for maintaining its population.

8. Proposed to separate *O. fluminalis* from *O. brevirostris* could not be accepted because the differences referred to are not important enough. The thin

acromion of Irrawaddy's scapula can be used to recognize this species from other dolphin which have large acromion.

9. The hump on the back of Indo-Pacific humpback dolphin could be clearly observed when it arched its back to begin diving. Furthermore the morphometric of Thai dolphin is similar to those of other *Sousa chinensis*. Hence proposed to split this dolphin from *S. chinensis* by some authors still could not be accepted.

10. The small *T. truncatus* in this study had the same characters as *T. aduncus* referred to by some authors but the differences is still not acceptable because most proportions of *T. aduncus* such as the tooth formula, 24-25/25, is in the range of *T. truncatus*, 18-26 teeth on each tooth row.

11. CBL, no. of teeth and many features of *S. longirostris* in this study were much smaller than those of spinner dolphins from other area. The spinner dolphin in this area should be separated from other *S. longirostris* by the number of teeth of Thai spinner, 37-45/36-45, while much higher number of teeth are recognized in spinner dolphins from other sources. However more new samples should be studied to confirm.

12. The disappearance of dolphin in the Thai rivers can contradicted to the changes in environmental condition. The decreasing of dolphin observed in the sea can also indicate the change of their food availability and environment from past to present. The distribution of four dolphins and a porpoise are somewhat differences although some species do have overlapping distribution. Among all, Irrawaddy dolphin plays a role as top predator in the most shallow waters, finless porpoise, Indo-Pacific humpback dolphin and bottlenose dolphin follow in deeper water respectively.

Recommendations

1. Eventhough few museums can preserve the old specimens of dolphin well but many collections were still found to be in bad condition. No central museum for mammal research as yet to set up in Thailand. Most museum preserve dolphin specimens just for exhibition but there is hardly any museum aimed for research. Collections for reseach and for public exhibition should be separated because sunlight, insect and fungi from exhibition activities might destroy and decrease quality time of preservation. Artificial exhibit specimens can be well used for exhibition instead of the real specimen of which can not be easily collected.

2. Taxidermic specimens has less value to study than skeleton. Therefore it should not be encourage to carry on. At present to keep specimen in taxidermic form had long been abandoned worldwide. This study emphasize the important value of skeletal specimens which could determine sex, age, species and some natural history character in consideration of both cranium and postcranial skeleton which taxidermy cannot.

3. Not enough samples to confidentially confirm the study is the common problem in marine mammal research. The network within the country from various locations in reporting the availability of specimens should effectively been set up. This study lost few specimens several times becuse of the delay in recieving the informations and it was too late to save that specimen either it was thrown away or too much rotten or damage to be abale to examine properly.

4. In the Inner Gulf of Thailand, the interview survey confirmed to be a good study method while the sighting survey is less effective but still needed. The interview survey had been considered not a good technique by some researchers but this study proved to be quite efficient perticularly, in the closed area where the

diversity is not too high, such as the Inner Gulf of Thailand. In the area of higher diversity such as in the Andaman sea the high number of offshore species of dolphins might cause confusion to the interviewees. Hence, the interview technique would not be effective in that circumstance.

Most coastal species found in the Inner Gulf are not acrobatic and shy to boat or disturbance, the sighting survey by boat would be hard to conduct in the Inner Gulf of Thailand. Particularly, finless porpoise has no dorsal fin and Irrawaddy dolphin has a small dorsal fin which would be difficult to observe in the sea.

5. Every species of dolphins and porpoise in the Inner Gulf of Thailand is now more difficultly to observe than in the past. The study to understand the situation for dolphin conservation should be immediately conducted. Although the study on dolphin and whale is rather difficult but it is possible to conduct. The disappearance of Irrawaddy dolphin in Thai river and the decreasing of dwarf spinner dolphin are the first alarming sign that the research on dolphin and porpoise in Thai waters must be urgently stimulated.

6. Many marine mammalogists try to designate the new species to those found in the Inner Gulf of Thailand. Due to the small sample size they had no conclusions should yet to be drawn for new species regarding geographical differences. This study still can not reveal the whole life history of finless porpoise and other four dolphin species, the taxonomic status of Thai humpback and spinner dolphin, but this work is presenting a series of questions for further study of Thai marine mammals, for examples :

- 6.1. Should Thai dwarf spinner dolphin be recognized as another species ?
- 6.2. Should Thai *Sousa sp.* remains as *Sousa chinensis* or should be recognized as new ?
- 6.3. Is bottlenose dolphin still a resident of the Inner Gulf of Thailand ?

- 6.4. What is now the status of population of each species of dolphins and porpoise ?
 - 6.5. Is there any dolphin or porpoise species to be consider as threatened species ?
 - 6.6. From this study August is in the lactation period of Thai finless porpoise. How long is the lactation period ? When is the mating and parturition season ? How large are the sexually mature size of male and female finless porpoises and neonate size ? Can the proportion of scapula be used for age determination as suggested in this study?
7. Thailand is still lack of expert in marine mammal. Any encouragement such as research fund, experience accumulation, advance degree support, etc. should urgently be given to young Thai scientists.



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