

FINAL TECHNICAL REPORT

Protecting the cetaceans of Berau Archipelago in East Kalimantan through establishment of a long-term monitoring network and conservation education post in Maratua Island



Berau Cetacean Conservation Project

Photo by D. Krieb



Executed by:
Conservation Foundation for
Rare Aquatic Species of Indonesia



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Preface and acknowledgements

This project was executed by the local Indonesian NGO, RASI Conservation Foundation (YK-RASI) and sponsored by the VTS Van Bree Award to whom we own a great deal of gratitude. This tentative final report presents about the activities implemented in the framework of the Berau large marine vertebrate conservation project. All activities as mentioned in the proposal except for the guidebook production and international article publication have been implemented to this date. An additional report will be sent no later than 31 March 2015, with the full cetacean survey results including zonation and density analysis. We also expect the guidebook to be ready and printed by then. We also hope that the international scientific article may be submitted and accepted in the course of 2015. Dr Peter van Bree and the VTS Van Bree Award have been honoured in the information panels and entrance sign boards of the newly established marine fauna information center. Further mention and dedication to Peter Van Bree and the Award will be made in the guidebook that is in progress of production as well as in the projected international article.

We would like to thank all project workers including students Elia, Ismail, Icha, Danang, Berly Pak Rudi, Anzar and eco-volunteers Joko, Stan, Hannah, Morgan, Ayse, Alice, Jamie, Sarah who were part of the survey- and campaign team, for their efforts. We also thank reefcheck trainers Derta Prabuning, Anzar and Mega for teaching RASI staff and local community members, pak Wewen, Firman, Julham, Bahruddin and Ilyas, whom we also thank for their commitment to learn and protect the reefs. Supporting local assistants Gaguk and Irvan are greatly thanked as well the families of pak Aspian Najit, pak Suwardi and pak Yono for their hospitality and care. We also thank our boatman pak Yani and his assistants. Moreover, we thank the Fisheries, Education and Tourism Departments of Berau for supporting our activities as well as all heads of villages and schools and their teachers in Maratua and Derawan Island as well as Tanjung Batu. Besides, we would also like to thank all interview respondents from Bohe Bukut, Bohe Silian, Payung-Payung and Teluk Alulu as well as all the participation of pak Yani, pak Firmansyah, Julham and pak Tarmi in the GPS training and for their participation in collecting data on cetaceans each time when they go out at sea with their boats.

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Budiono, Ir.
Executive Director
Yayasan Konservasi RASI
Komplek Pandan Harum Indah
(Erliza), Blok C, 52
Samarinda, Kalimantan Timur
Indonesia
Tel/ fax: + 62.541.206406
E-mail: yk.rasi@gmail.com
<http://www.ykrasi.org>



Danielle Krebs, Ph.D
Scientific Program Advisor

same postal and email address

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Introduction

The Indonesian Archipelago contains some 5 million km² of territory (including water and land), of which 62% consists of seas within the 12-mile coastal limit (Polunin, 1983). However, in spite of this extensive water mass only few reports on cetaceans are available. Rudolph *et al.* (1997) reported at least 29 species of cetaceans to occur in the seas of the Indonesian Archipelago and Setiasih *et al.*, (2010) at least 35 cetacean species. However, only a few dedicated studies have been conducted on the abundance, distribution and conservation of cetaceans in Indonesia such as long-term research conducted on several cetacean species in Komodo National Park waters and in Lovina, Bali as well as on the Irrawaddy dolphin, *Orcaella brevirostris* in the Mahakam River and coastline in East Kalimantan (Kahn *et al.*, 2000; Mustika *et al.* 2012; Kreb, 2004, Kreb & Budiono 2005, Kreb *et al.*, 2010, Kreb & Lim, 2008). Cetaceans are threatened with local extinction in many parts of the world, but nowhere more obviously than in Asia. Growing human populations are putting an increasing pressure on natural resources and rivers, estuaries and coastal marine waters are becoming increasingly unhealthy ecosystems for wildlife. Modification and degradation of the habitats of dolphins and porpoises have often resulted in dramatic declines in their abundance and range (Reeves *et al.*, 1997). Hunting is largely unregulated throughout most of Indonesia, and environmental degradation proceeds unchecked. Investigation of the status of cetaceans in the Indonesian archipelago was one of the research projects recommended in the 2002-2010 Action Plan by the IUCN/SSC/Cetacean Specialist Group (Reeves *et al.*, 2003). In response to this need, several surveys were conducted (2003, 2007 & 2008) in identified important coastal dolphin areas in East Kalimantan, such as the marine protected area of the Berau archipelago in East Kalimantan (Kreb *et al.*, 2008).

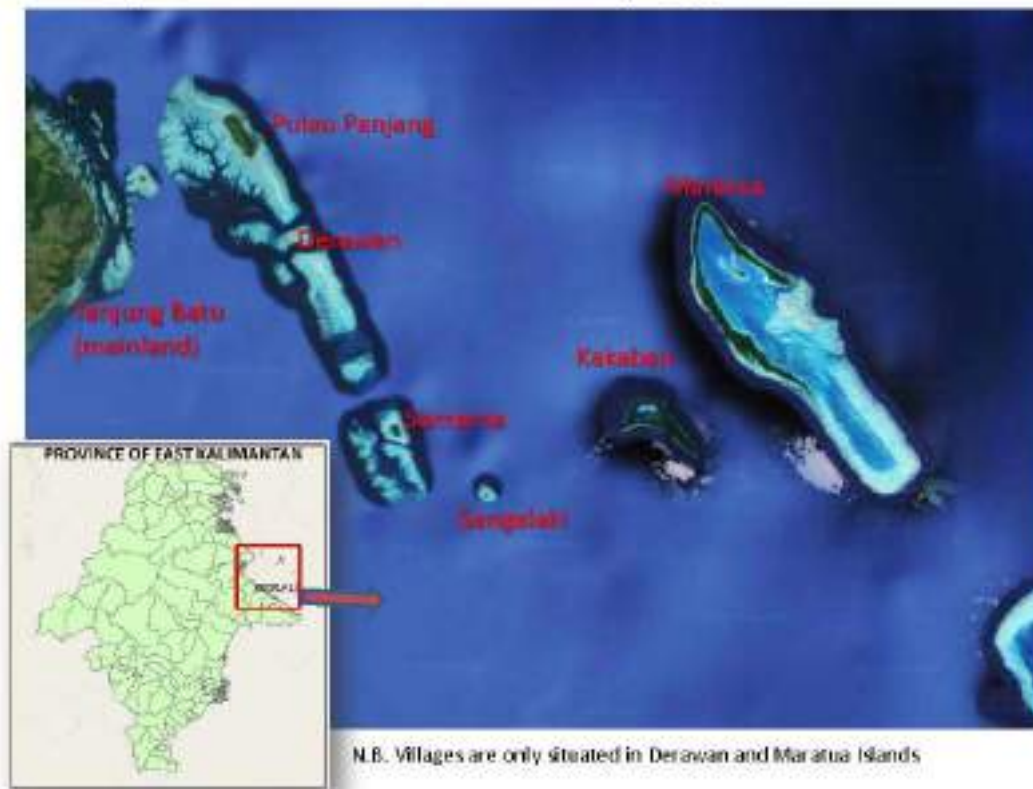
Based on the overall analysis of these surveys the Berau MPA appeared to possess the highest species diversity and cetacean abundance compared to equally large-sized areas in East Kalimantan. The area encompasses a diversity of habitat (delta, reef, shelf and slope waters) and marine life and supposedly provides a migratory passage for larger whales between the Pacific and Indian Ocean. Fifteen different cetacean species were encountered here before as well as dugongs. Preliminary threats identified involve illegal fishing practices, such as blasting, trawling, overfishing, by-catch and directed, illegal captures of dolphins for the international market and as shark bait, of which many activities are conducted by people from outside the area, which stresses the need for an intensified patrolling. Although Berau has a declared MPA and patrols nearshore have increased somewhat, the outer islands such as Maratua are less frequently patrolled and more susceptible to illegal fishing activities. Dugongs and turtles have traditionally been hunted by local residents using parts of bones and shell for several handicrafts, urging the need for increased awareness as well as improper waste disposal.

The project aimed to protect a high diversity of cetaceans, dugongs and other large marine vertebrates in the Marine Protected Area of Berau for which currently no specific protection zones and management is in place. Survey research results will indicate important and sensitive dolphin habitat that will be recommended for increased patrol and management measures. A better protection was also aimed by raising local awareness, establishment of an environmental education post, distributing posters on cetaceans and how to handle in strandings, training in sustainable handicrafts, conducting surveys to detect seasonal species occurrence, core habitat and engaging cooperating local fishermen in cetacean monitoring. These fishermen were trained in species identification and GPS marking and may facilitate dolphin-friendly tourist trips.

Methods & results

The activities mentioned above were conducted during four visits to the northern islands group within the Derawan Archipelago (Figure 1) between 24 June-8 July 2013 (period 1); 29 September- 10 October 2013 (period 2); 12-21 June 2014 (period 3); 10-20 October 2014 (period 4).

Figure 1. Northern islands of Derawan Archipelago, Berau District



- **Period 1, Methods:**

- During period 1, initial contacts (**socialization**) were made with the four local villages on Maratua Island, one village on Derawan Island as well as the mainland harbor village, Tanjung Batu to ask for permission from the village heads and schools. Permission was also requested as well as from the district government (Fisheries, Education and Tourism departments) to conduct all our activities.
- **Interviews** were conducted with 20 respondents (total 80 respondents) in each of the four villages in Maratua and posters about marine mammal distributed in all villages.
- The first of **four cetacean surveys** were conducted between 29 June and 5 July 2013. Survey area encompassed the northern islands group within the MPA because a higher diversity of cetacean species was detected here because of the slope waters (>200m) compared the southern islands within the MPA, which represent shelf areas. It is planned to survey this part of the MPA in 2015-2016. The methods and full detailed results of the 2013-2014 surveys will be described in a separate technical report. In this report we will only provide a summary of the survey results. The aims of the surveys are to detect seasonal cetacean relative abundance, threats, diversity and distribution

patterns that will form the basis for recommendations to local park management authorities for increased attention/ patrols as well as for the fishermen to find reliable dolphin or whale spots to bring tourists.



Eighty interviews were held using a questionnaire about the distribution and conservation of marine mammals and larger marine vertebrates in all four villages on Maratua island.



The most impressive non-formal interview was held with Pak Dervin from Payung-payung village on Maratua Island, who told us how he and his brother in law got rescued by a group of dolphins in 1998 after his boat capsized in a storm. We got permission to tell the story to children at schools during the school campaign. His story inspired many people and put a local ban on shark fishing using dolphin bait in Maratua and Derawan island.



Socialization was done prior to the execution of all project activities including heads of villages and schools and district government.

- **Period 1, Results:**

- The result of the socialization was that all our planned activities were well received by all relevant authorities and villagers themselves.
- The results of the interview surveys indicated that the majority of fishermen are small-scale fishermen and conduct for between 95%-100% per village fishing by angling using . Only 5% in some villages fish with nylon gillnets. No dolphins has ever been caught by any of the respondents. Communities' target fishes include: grouper, tuna, snapper, trevally, octopus, reef fish. Dolphins are encountered throughout the year near Maratua and Kakaban Island, whereas whales are usally seen during calm sea days during the northern wind season or months 2-6. Most whales observed are mostly large 70-90% of respondents in each village compared to medium sized whales. Orcas are occurring quite regularly in the area in small group sizes up to 6-7 individuals and several anecdotal interactions exist. The most unique authentic story was told by Mr Dervin, a senior villager who was saved by a group of dolphins after his ship capsized during a storm. Because of this story since 1998 no more dolphins are being hunted by the population of Maratua and Derawan, which used to be done for shark bait. The islanders identified two species of turtles, i.e. green and hawksbill turtle and also indicated turtle nesting sites in Sangalaki as well as in the southern islands of Belambangan, Bilang-bilangan, Mataha, whereas turtle migration takes place al year-round. Turtle mating also take place at least between May and October. Turtles feed on the west side of Maratua Island in front of the village of Payung-payung. All villagers were already aware that cetaceans, turtles and dugongs are protected. All respondents answered that dugongs' populations had decreased because of the boat traffic on feeding areas and the fact they are being hunted.
- All detailed survey results will be presented in a separate report. During this first, seven-days-survey 22 sightings including mixed species sightings were made of five different species: spotted-, spinner-, dwarf spinner-, Indo-Pacific bottlenose- and common bottlenose dolphins. Most abundant species during this period were spinner dolphins (pictures below).



- **Period 2, Methods:**

- During period 2, a **conservation awareness campaign** was conducted with schoolchildren of 5 elementary-, 2 junior- and 2 senior high-schools in Maratua and Derawan islands and the mainland port village of Tanjung Batu. Each campaign on each school lasted for 2,5 hours and included presentations on marine mammals and vertebrates, interactive discussions and games as well as drawing or essay competition.
- The second cetacean survey was also undertaken between 3-9 okt 2013.



Period 2, Results:

- The awareness campaigns were followed enthusiastically. Already some direct success was obtained in raised awareness among youth from Derawan Island that used to capture clown fish from the reef and sell it in small plastic bags along the street or put it in a bowl at home. During the campaign the children promised not to capture the fish anymore and until now no clown fish has been put on for sale anymore in Derawan Island.
- During the second cetacean survey lasting 7 days at least 26 sightings including mixed species sighting were made of 6 species. Five species were the same as in the first survey, whereas an additional species observed were false killer whales.



Spinner dolphins



Melonheaded whales

Common bottlenose dolphin

- ***Period 3, Methods:***

- During period 3, - a small **environmental education and research post** in the island of Maratua was established. In the post environmental educational billboards, posters, popular and scientific library books on marine life biota and sustainable resource use were made available to open public from young to old age. A special billboard was also erected to explain about RASI, this project and about Dr Peter van Bree. Van Bree's name is also honoured in the entrance sign board to the information center. A small cetacean guidebook with marine vertebrate species of East Kalimantan known to occur sofar will be produced (not yet) and sold to tourists (income used for new guidebooks) and be provided for free to collaborating fishermen.

- **Training** was provided by an invited trainer from Jakarta who was specialized in making **sustainable handicrafts** to interested local youth, men and women to produce handicrafts from plastic waste materials and coconut shells. The handicrafts produced can be put on sale by each and everyone in the information center.
- A **long-term marine mammal monitoring and conservation network** was established in the following ways:
 - 1) by involving four **fishermen** from Maratua Island with medium sized boats, who were interested to conduct dolphin tourist trips and help to monitor and report illegal fishing activities. They were trained both theoretically and in practice on one specially designed boat-day while joining several other survey days. The training involved identifying dolphin and whale species, observing dolphin watching guidelines using a simple GPS unit and data logbook to mark cetaceans and dugongs but also whale sharks and manta rays. Each fishermen was provided with a logbook, english conversation pocket book, laminated cetacean photo-identification sheets, stranding manual and a GPS unit. Monitoring of marine vertebrates will be done opportunistically each time when these fishermen go out fishing. Data can be downloaded at a laptop that was provided to the coordinator of the fishermen, Mr Yani. Every 3 months data from gps will be downloaded and the corresponding logbook data photocopied.
 - 2) obtaining overseas paying **volunteers** for cost sharing of the survey boat to be able to conducting the **cetacean surveys** at least twice yearly from now onwards. These overseas volunteers all have a marine mammal background and are capable of observing with binoculars and are under supervision of senior observers from RASI. During period 3 already three volunteers were included to see if this is a sustainable and effective way of doing surveys in the area.



Aiming to increase the sense of belonging by local residents of Maratua and government of Berau District, the education center was named: The Maratua Marine Fauna Information Center- Pusat Informasi Hewan Laut Maratua. Donated by VTS van Bree Award and carrying the VTS logo.



One of the information boards has a special text box in recognition of Dr Peter van Bree and the VTS Van Bree Award as well the welcoming entrance signboard.



Handycraft training workshop



GPS- and cetacean-identification training with four fishermen

Period 3, Results:

- The education post is a useful place for local people that want to learn more about sustainable handycraft production, and the tools to make these are available here. Already several products made from plastic waste and coconut shells have been put on sale as observed during the visit in period 4. Also, according to the caretaker of the center, children often read the books in the small library and already around thirty tourist came to see and wrote positive comments inside the book. The tourism department of Berau district also expressed its appreciation and thanks for opening the center to promote and educate about the local fauna.
- During the handycraft training at least 20 people received training during one week. Several equipment was donated including driller, sawboard, grinder, small tools (pincers, cutters etc). During the next visit several handycrafts were made and put up for sale. The village also received orders for making lamps from coconut.
- The locally established marine mammal monitoring network, after it received traing in period 3 both theoretical and practical training onboard, was up and running when we visited the island during period 4. All fishermen filled sightings of cetaceans in their logbook and were able to correspond these sightings with codes saved in their GPS. These data will be part of long-term data collection. Also, the use of experienced overseas volunteers is a useful initiative that allows for long-term monitoring. The volunteers in period 3 and 4 were all very enthusiastic and some are willing to come again next year. For 2015 it is now planned to survey the southern islands of the marine protected area and already more volunteers through the marine mammal mailing list have applied than we are able to receive. Cost sharing with the overseas volunteers allowed us to bring local students without additional costs during period 3 and 4 that use the data for their graduate thesis.
- During the cetaceans survey in period 3, 17 sightings were made of seven species in total. The same five species were encountered as observed during surveys 1 and 2 and additionally two new species were detected, i.e. Fraser's dolphins and melon-headed whales (third row pictures below), which represent the first sighting of this latter species for East Kalimantan. Both species were mixed in one sighting. Sightings were also made of mating turtles and giant manta rays.



Indo-Pacific bottlenose dolphins



Fraser's dolphin



Melon-headed whale



Common bottlenose dolphin



Spinner dolphin



Fraser's dolphin



Mating green turtles

- **Period 4, Methods:**

During period 4, besides the **cetacean survey** that was conducted, in following up of the establishment of a long-term marine mammal monitoring and conservation network, collaboration was established with the organization Reefcheck and the Fisheries Faculty of Mulawarman University in UNMUL to train local residents and students in a method to monitor the reefs from their own island named *Reefcheck* (Hodgson *et al.* 2006). Because the preliminary results showed a strong link of cetaceans' abundance (up to 80% of sightings) and other large marine vertebrates within 5km radius off reefs, protection of these reefs are a high priority of cetacean conservation in this area as well. Again, allowing overseas paying volunteers to join the survey allowed for local students to join the survey and make a thesis (forestry student) or provide training in return (reefcheck fisheries student) for the received training in observing marine mammals. The **reefcheck training** was conducted by two professionals and one student and was outreached to 15 people including a local high-school teacher and his two students, four community members, two university students from Samarinda and Yogyakarta, which latter has a long-term program for students field work in Maratua), four overseas volunteers and two staff from RASI. Reef check training theory involved one day and practical training was performed during boat-resting hours during the survey. In total four reefs were monitored in the Islands of Maratua, Sangalaki and Kakaban.

Period 4, Results:

- At least 4 community members have been trained into reefcheck data collection methods. We consider this team to be an important asset for future reefmonitoring, which if they have obtained a certificate level may conduct their own monitoring. The university agreed to contact the team each time when the university will do reefcheck survey in the area to increase their skills so that one day when there is the opportunity to pass their certification exams they are able to obtain the certificate.
- The four reefs surveyed during the current reef checks were overall in healthy condition without any signs of bleaching or disease. The coral coverage density based on Gomez & Yap (1998) varied between low-average (Sangalaki) and average-good (Kakaban, Maratua). The reefs around Kakaban Island indicated that there was overfishing for commercial fish species (five indicator fish species were found but at low abundance) and even invertebrates. Groupers were only found at low body sizes. The reefs at Kakaban island showed signs of damage due to boat anchorage. All corals around Kakaban involved hard corals, which may be due to the larger extent of exposure to waves. Only Sangalaki had both hard and soft corals as well as living algae. Maratua yielded seven indicator species, although at low abundance, whereas at Sangalaki five indicator fish species were found but with highest abundance. Only small-sized giant clams were found at Sangalaki and Maratua, a sign that these are actively being collected. Lobsters were only found at Sangalaki and Maratua Islands.



Bumphead parrot fish are among the indicator species for reefcheck. Their presence in Maratua Island indicates that collection of this species, for which their usually is a high demand within the aquarium trade business, is still not a major issue on this particular reef. On all other reef sites, no bumphead parrot fish were found.

- Regular monitoring is important to see if the present trends and health of the reef system are increasing or decreasing.



The picture aboves are showing a cuttlefish metamorfosis. In the right image, the cuttlefish (in the center) takes the appearance of surrounding reef.



Picture (left), bowriding dolphins are carefully inspected to identify marks that allow for individual identification and check for site fidelity of individual dolphins. Pictures (right), survey team composed of RASI staff, volunteers and students (high school, university). Picture (right, below), two high schools students from Maratua being initiated in reefcheck datasheet for data collection.

- During the seven-days **cetaceans survey** in period 4, 25 sightings were made of eight species in total. The same species were observed as in survey 3 and additionally one new species was detected, i.e. Risso's dolphin, which represent the first sighting of this latter species for Berau district. Just as in survey 3, melonheaded whales and Fraser's dolphin were mixed together in one sighting.



Spotted dolphins



Spinner dolphins



Risso's dolphins



Fraser's dolphins



Melon-headed whales

Discussion

The project has much contributed towards the establishment of self-sustaining long-term conservation of marine mega fauna by the community of Maratua in several ways: The production of sustainable handicrafts instead of handicrafts from turtles and dugongs as is common practice in Derawan and Bali amongst others, involvement of trained fishermen in GPS marking and cetacean identification as well as overseas paying volunteers that allow for long-term monitoring in the northern part of the MPA of Derawan Archipelago. Moreover, the establishment of the information center on marine fauna informs local tourists and community on the protection status and unique life histories of these fauna through the information panels and available literature for both the young and older generation. It also provides ethical guidelines for tourists in terms of dolphin/ whale watching, jelly-fish lake snorkling behavior, souvenirs purchase. At the same time this post sells the eco-friendly souvenirs made by the local community. The fact that local community members and school teachers were trained in performing reefcheck allows them to check the health of the reefs around their own island, which should function as an early warning system if changes occur in substrate, fish or invertebrates composition. A healthy reef will also benefit several species of dolphins in the area that tend to remain in close vicinity of the reef and also often feed directly near and on the reef.

Our future objectives are to continue the monitoring and also extend to the southern part of the MPA (shelf waters), where we would also like to perform awareness campaigns at schools. For the northern part of the MPA (slope waters) with the highest diversity of cetaceans, zonation analysis will be performed in terms of density/ habitat use/ diversity and will be prepared in a separate report to be handed to the local and national government and to the Van Tienhoven Stichting.

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