ANALYSIS OF THE CAUSE OF CETACEAN "SHORT – FINNED PILOT WHALES (GLOBICEPHALA MACRORHYNCHUS)" STRANDINGS ON PROBOLINGGO COAST, EAST JAVA PROVINCE, INDONESIA

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ABSTRACT

Indonesian waters is one of the habitat and simultaneously a migration path so many different species of mammals of Cetacean (whales and dolphins) and Sirenia. Whales and dolphins are a group of aquatic animals that are often washed up on the shores of Indonesia. Strandings of marine mammals requires fast action and precise handling, particularly those that are still alive so it can be saved, as a safeguard and preservation. The researchers do not have a definitive reason why stranded marine mammals, but there are many theories and analytical approach through the predictions are used to determine the cause. The social life of animals, bad weather, extreme ocean waves and animals follow prey to the beach are some of the most likely causes. Some of the other causes that have been identified is a disease, a parasitic infection, the growth of harmful algae, injuries from boat collisions or entangled, trauma, hunger and military exercises using special sonar. The current of the tides are strong and vary from day to day, causing indeterminate conditions for navigation are predicted as one of the causes. Decreased oxygen levels and water salinity are thought to be among the causes that led dozens of short-finned pilot whales to wash up on a beach in Randupitu village, Gending district,

Probolinggo regency, East Java. Data from the Meteorology, Climatology and Geophysics Agency (BMKG) Juanda, Surabaya, reveals that it was likely that strong currents in the northern Java Sea had carried the pilot whales ashore. According to the data, strong winds of more than 28 knots caused high seas with 2 to 3.5 meter waves. The high waves also caused oxygen level decreases deep below the surface and lowered water salinity, which was accompanied with a sea level rise. The BMKG added that these three elements had led deep water fish to migrate to the surface, leading many of them to become stuck in shallow waters.

Keywords: Pilot whales, analysis, cause, stranding

INTRODUCTION

Indonesian waters is one of the habitat and simultaneously a migration path so many different species of mammals as the Cetacean (whales and dolphins) and Sirenia. Whales and dolphins are a group of aquatic animals that are often washed up on the shores of Indonesia. Indonesian waters have a diversity of marine mammals are remarkable, more than 30 species recorded to date. More than a third species of whales and dolphins are known in the world can be found in the waters of Indonesia, including some rare and endangered species such as the blue whale (*Balaenoptera musculus*). Dugong (Dugong dugon) is one of the groups other marine mammals that sirenians can also be found in shallow grassy sea in Indonesia. Their habitat is the major rivers, mangroves, beaches and the open sea environment. In Indonesia, diverse habitats are often located close to each other.

Frequent strandings of whales and dolphins in Indonesia is an alarming phenomenon. We still do not know exactly the status of populations of species of whales and dolphins in Indonesia. Incident stranded or strandings of marine mammals, dead or alive requires action fast and precise handling that can be a major contribution for the safety of marine mammals that stranded them in addition it also maintaining the safety and health of the surrounding communities stranded and we also want to show the world that Indonesia play an active role in the conservation of marine mammals are protected. The speed and accuracy of handling will provide greater opportunities for stranded marine mammals to be able to return to live in the wild.

In general, the incidence of stranded is not a natural thing for whales and dolphins, in the sense that these animals are naturally beached themselves. The researchers do not have a definitive reason why stranded marine mammals, but there are many theories and analytical approach through the predictions are used to determine the cause. The social life of animals, bad weather, extreme ocean waves and animals follow prey to the beach are some of the most likely causes. Some of the other causes that have been identified is a disease, a parasitic infection, the growth of harmful algae, injuries from boat collisions or entangled, trauma, hunger and military exercises using special sonar.

CASE REPORT

Initially, there was information about pass over and over again of marine mammals at strait Pasir Putih from fishermans on 9 June 2016 when representation of Faculty of Veterinary Medicine, Airlangga University and BPSPL (Balai Pengelolaan Sumberdaya Pesisir dan Laut) hold technical guidance of handling and rescue stranded marine mammals at Sido Muncul Hotel, Pasir Putih, Situbondo Regency. At the time it was happening tide and representation of Faculty of Veterinary Medicine, Airlangga University and BPSPL had prediction that there will be stranded mammals in the near future. Then on 15 June 2016, 32 short-finned pilot whales were found stranded as individuals and in scattered groups, spread out over many kilometers of convoluted coastline and mangrove Randupitu beach, Bentar beach, Probolinggo Regency.

Of these, 15 pilot whales were discovered dead over a period of 1 to 2 days. Seventeen spreaded at several beaches were success released to high seas. Of 15 pilot deads, the group included 7 females, 2 males, and six of unknown sex. Case mass strandings short fin pilot whale (Short-finned pilot whales) on the coast Randupitu, Gending, Probolinggo is a testament and reaffirmation of how the waters of Indonesia with a large area is a habitat and at the same migration path of various species of marine mammals. Based on data and mapping, habitat and migration paths of short fin pilot whales is in the waters warmer or tropical waters in some tropical regions in different parts of the world in general, as the waters of Indonesia. While habitat and a migration path long fin pilot whale (Long-finned whale pilot) is in the cooler waters in the temperate, subtropical waters[1 - 3].

The current of the tides are strong and vary from day to day, causing indeterminate conditions for navigation are predicted as one of the causes. Decreased oxygen levels and water salinity are thought to be among the causes that led dozens of short-finned pilot whales to wash up on a beach in Randupitu village, Gending district, Probolinggo regency, East Java. Data from the Meteorology, Climatology and Geophysics Agency (BMKG) Juanda, Surabaya, reveals that it was likely that strong currents in the northern Java Sea had carried the pilot whales ashore. According to the data, strong winds of more than 28 knots caused high seas with 2 to 3.5 meter waves. The high waves also caused oxygen level decreases deep below the surface and lowered water salinity, which was accompanied with a sea level rise. The BMKG added that these three elements had led deep water fish to migrate to the surface, leading many of them to become stuck in shallow waters.

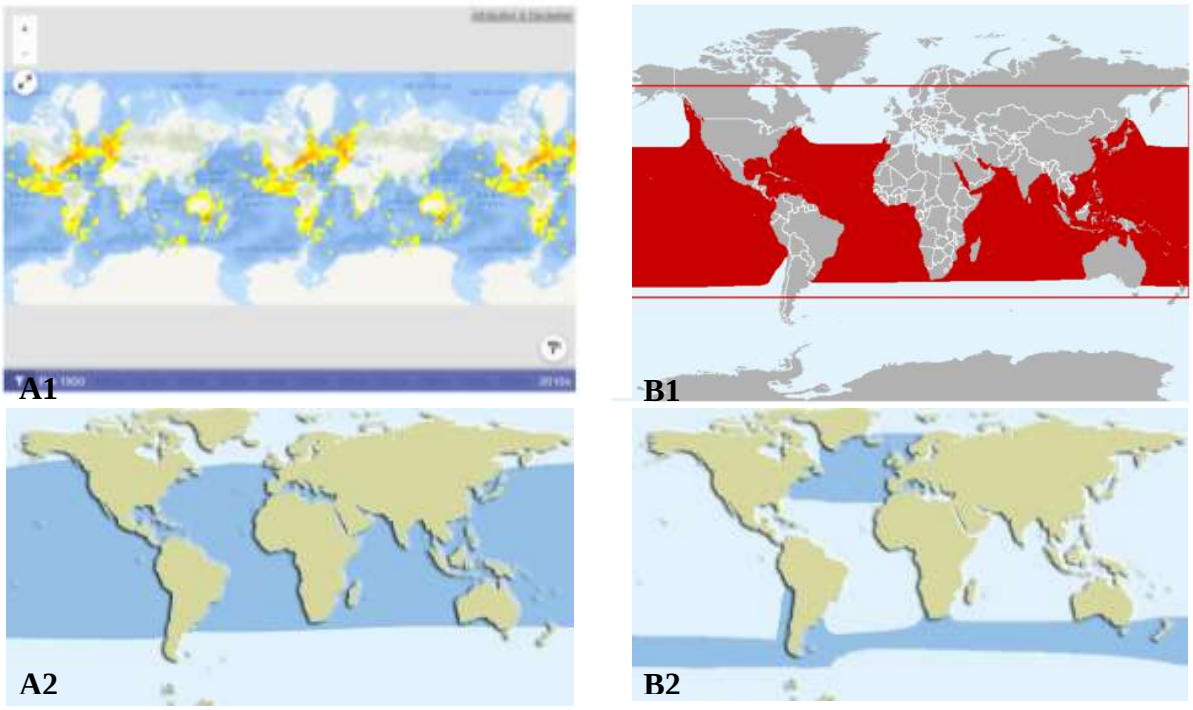

Figure 1. Habitat and migration paths of short fin pilot whales is in the waters warmer or tropical waters in some tropical regions in different parts of the world in general, as the waters of Indonesia (A1 and A2), while long fin pilot whale (Long-finned whale pilot) is in the cooler waters in the temperate, subtropical waters (B1 and B2) (http://www.whale-world.com/pilot-whale/)

Figure 2. Case mass strandings short finned pilot whale on the coast Randupitu, Gending, Probolinggo Regency. A-B, mass pilot whale seen on the ground after low tide; C, pilot whale convoluted mangrove; D, pilot infiltrate mangrove.

Figure 3. Measurements of body parts short finned pilot whale mass stranding was to find a picture of each individual morphometry. A, collected dead pilot whale; B, measurement activities

Table 1. Morphometry of body parts short finned pilot whale mass stranding for each individually.

Body part morphometry (cm)	Number of pilot whale								
	1	2	3	4	5	6	7	8	9
Sex	♀	♀	♂	♂	♀	♀	♀	♀	♀
Blow hole - caudal peduncle	264	360	471	335	303	239	135	308	333
Blow hole – muzzle	59	66	74	66	69	56	55	68	-
Dorsal fin	33	81	103	68	64	48	-	70	38
Pectoral fin	51	70	95	66	63	53	46	51	53
Caudal fin	79.5	52	68	44	54	34.5	67	102	-
Outer circumference	154	116	145	110	101	126	90	-	111
Head circumference	140	146	136	140	84	62	148	-	102
Behind the pectoral fin circumference	156	106	152	95	81	79	-	-	76
Body circumference	100	142	114	69	67	56	82	150	67

Data collected at 16 June 2016

DISCUSSION

Mass strandings are defined as two or more cetaceans that are found ashore alive or dead and which are spatially and temporally correlated [4]. Species that mass strand are typically more social and pelagic animals which are often less accustomed to shallow or in-shore habitats [5]. Some geographic areas have a higher incidence of mass strandings, whereas other mass strandings may occur following specific weather or oceanographic events. Causes of mass strandings are varied. Often many animals in a particular mass stranding event appear physically normal, and frequently no cause of the stranding or mortality is evident upon gross examination. More often than not, response to mass strandings overwhelm the stranding network even in areas which have standardized protocols and considerable resources and experience. The sheer volume of work or the decomposition of the carcasses may preclude in-depth studies of the stranded animals, but every effort is made to examine animals as thoroughly as possible to allow more complete investigations of causes of mass strandings. From that incident of short finned pilot whale mass stranding, we concluded increased interest and coverage of cetacean stranding events in Indonesia resulted in the recording of the stranded short finned pilot whale in Probolinggo. It is important to strengthen the country's stranding network by conducting meetings that include training on the proper methods of handling stranded cetaceans and procedures to collect data during the rescue. Stranding events also provide excellent opportunities to further study on short finned pilot whale in Indonesia. Interviews with local inhabitants of coast of Probolinggo and the surrounding should also be conducted to retrieve more information on cetacean sightings in the Archipelago.

COMPETING INTERESTS

Authors do not declare any possible conflicts of interest.

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REFERENCES

1. Jefferson TA, Webber MA, Pitman RL. Marine mammals of the world. Amsterdam: Elsevier, 2008.
2. Rice, D.W. Marine Mammals of the World. Systematics and Distribution. Anacortes: Society for Marine Mammalogy Special Publication, Serial 4, 1998; 1–231.
3. Taylor, BL, Baird R, Barlow J, Dawson SM, Ford J, Mead JG, Notarbartolo di Sciara G, Wade P, Pitman RL. *Globicephala macrorhynchus*. IUCN Red List of Threatened Species. Version 2010.4. Available online at www.iucnredlist.org. (accessed 12 May 2011).
4. Wilkinson, D.M. 1991. Program Review of the Marine Mammal Stranding Networks. Report to the Assistant Administrator for Fisheries, NOAA, National Marine Fisheries Service, Silver Spring, MD. (available from NMFS Office of Protected Resources, Silver Spring, Md).
5. Geraci, JR, Lounsbury VJ. Marine Mammals Ashore. Galveston: Texas A & M Sea Grant Publication, 1993; 133 - 143.