

# Stranding of Whales: its causes and measures to protect stranded animals

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## Introduction

Cetaceans are aquatic mammals constituting the infraorder Cetacea. There are around 89 living species, which are divided into two parvorders. The first is the Odontoceti, the toothed whales, which consist of around 70 species, including the dolphin (which includes killer whales), porpoise, beluga whale, narwhale, sperm whale, and beaked whale. The second is the Mysticeti, the baleen whales, which have a filter-feeder system, and consist of 15 species divided into 3 families, and include the right whale, bowhead whale, rorqual, pygmy right whale, and gray whale. Marine mammals – such as whales, dolphins, porpoises and sea cows have long been considered to be some of the most spectacular and majestic mega fauna on earth. But due to the direct and indirect impacts of human activities on the majestic beauty and inspiring species of marine mammal, they have been listed as threatened or endangered in the last several years.

Strandings are a natural phenomenon when whales get “stranded” or stuck on a beach. Most stranded cetaceans are already dead or very ill; however some cetaceans are alive and seemingly healthy. Cetacean stranding, commonly known as beaching, is a phenomenon in which whales and dolphins strand themselves on land, usually on a beach. Beached whales often die due to dehydration, collapsing under their own weight, or drowning when high tide covers the blowhole (Blood, 2012). Of 78 species of cetacea, only 10 species regularly mass strand and another 10 species occasionally strand. Interestingly enough, most mass strandings occur in toothed whales species (such as sperm whales, beluga whales and pygmy sperm whales). National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Services (NMFS, 1992) defines a stranded animal as any dead marine mammal on shore, any live dolphin or whale cast ashore or unable to return to its natural habitat, or any live seal that cannot leave shore due to injury or poor health.

## Stranding of whales in India and abroad

Stranding incidents of marine species along the Indian coast are not a recent phenomenon. However, with increasing social awareness and interest in marine science, there has been an increase in reporting such incidents.

New Zealand has one of the highest stranding rates in the world. On an average, about 300 dolphins and whales strand each year. Most stranding is of individual animals, but mass strandings are common and can involve hundreds of animals at a time.

Strandings of whale and dolphin are also found along the coastline of Cape Cod, Indonesia, Ireland and Scotland.

## Types of strandings

### Single Strandings

Single strandings occur when one cetacean strands on a beach. This can include a living or dead baleen or toothed whale species and includes either a single individual or a mother and her calf. Since a calf is still dependent on his or her mom, stranding with mom is considered a single event. Single live strandings are often the result of illness or injury. This means that the cetacean died of natural causes and then tides and winds washed them ashore, which almost inevitably end in death in the absence of human intervention. Sometimes the cetacean is alive when it strands but usually it dies soon afterward.

### Mass Strandings

Mass or multiple strandings are rare. Mass strandings primarily occur when 2 or more (not including a mom and calf) whales or dolphins strand together. These are typically social groups of toothed whales (dolphins, pilot whales, sperm whales, etc.) who are usually alive when the stranding occurs. Occasionally the animals can be saved by refloating the entire group and releasing them all together. Cetaceans in a mass stranding that are released one by one tend to re-strand themselves – possibly because of the attachment that they feel towards the rest of their groups.

## Highlight Points

- Whales are living creatures of the open ocean belonging to cetaceans group.
- Cetacean stranding is a phenomenon in which whales and dolphins strand themselves on land, usually on a beach.
- Baleen whales are commonly stranded along the Indian coast in different coastal regions.
- Strandings are complex events and may be due to extreme tidal fluxes, extreme weather condition, solar storms, human activities, illness or injury or pollution (toxic effects of oil spills).

Date	Location	Species	Notes	Reference
27th Nov 1960	Gulf of Mannar, Tamil Nadu	Blue whale ( <i>Balaenoptera musculus</i> )	20.8 feet long	Marichamy et al., 1984
30th April 1979	Gulf of Mannar, Tamil Nadu	Male Sperm Whale ( <i>Physeter macrocephalus</i> )	26.5 feet long; no visible injury on the body of the whale; Blood was oozing out through the mouth, eyes and genital opening.	James and Soundararajan, 1979
25th Nov 1994	Gulf of Mannar, Tamil Nadu	Blue whale ( <i>Balaenoptera musculus</i> )	43.6 feet long; having 80 thorax grooves.	Lipton et al., 1995
21st Dec 2001	Guijebettu beach, Udupi, Karnataka	Blue whale ( <i>Balaenoptera musculus</i> )	40.3 feet long	Anoop et al., 2004
13th April 2004	Padubidri, Udupi, Karnataka	Baleen whale	32.1 feet long; vertebrae and baleen plates were found exposed	Anoop et al., 2004
11th Aug 2004	Kota beach, Udupi, Karnataka	Baleen whale	35.1 feet long	Anoop et al., 2004
17th Sep 2009	Devbagh beach, Karwar, Karnataka	Female Sperm Whale ( <i>Physeter macrocephalus</i> )	32.91 feet long; it is VU mammal (IUCN 2008)	Naik et al., 2010
15th Feb 2013	Keni beach, Ankola, Karnataka	Cuvier's Beaked Whale ( <i>Ziphius cavirostris</i> )	16 feet long	Naik et al., 2015
23rd July 2015	Ullal beach, Mangalore, Karnataka	Baleen whale	39 feet long; decomposed condition	CMFRI, 2015
30th July 2015	Thannerbhavi beach, Mangalore, Karnataka	Baleen whale	44.2 feet long; decomposed condition	CMFRI, 2015
6th Aug 2015	Malpe beach, Udupi, Karnataka	Baleen whale	49 feet long; decomposed condition	CMFRI, 2015
27th July 2016	Hollangadde, Kumta, Karnataka	Baleen whale	46 feet long; decayed condition	Vaidya, 2017
20th July 2016	Ramangindi, Dhareshwar, Kumta, Karnataka	Bryde's whale ( <i>Balaenoptera edeni</i> )	44 feet long; decomposed condition	Vaidya, 2017
13th Aug 2016	Pavinkurva-taribagilu Honnavar, Karnataka	Blue whale ( <i>Balaenoptera</i> sp.)	40 feet long; decayed condition	Vaidya, 2017
27th Aug 2016	Agatti Island, Lakshadweep.	Dwarf Sperm Whale ( <i>Kogia sima</i> )	6.2 feet long; decayed condition	Aneesh et al., 2019

Unfortunately, most whales are already dead or do die when stranded. However some stranded cetacea are saved by tides (they just swim away) and some others are saved by human efforts. The carcasses of deceased cetaceans are likely to float to the surface at some point; during this time, currents or winds may carry them to a coastline. Since thousands of cetaceans die every year, many become stranded posthumously. If one gets into trouble, its distress calls may prompt the rest of the pod to follow and beach themselves alongside (Anton, 2003). Most carcasses never reach the coast and are scavenged or decomposed enough to sink to the ocean bottom, where the carcass forms the basis of a unique local ecosystem called whale fall.

#### Reasons for stranding

Strandings are complex events and there are many reasons why dolphins and whales may strand. In most cases the exact cause is unknown but any one of the following factors, or a combination of them, can be the cause.

- 1. Extreme tidal fluxes:** Mass strandings often coincide with full and new moon tidal cycles. The extreme high and low tides during full moons allow animals to swim farther inshore than normal, leaving them high and dry when the tide turns.
- 2. Extreme weather:** High winds and stormy seas can cause a storm surge, allowing animals to go farther inshore than usual, making them more likely to become stuck when the tide recedes. It is also thought that these conditions may increase the likelihood that animals become disoriented in complex coastal areas.
- 3. Complex topography:** Animals come near shore at different times of the year and may become disoriented and trapped by complex inlets and the hook-like shape of areas such as Cape Cod, Massachusetts. Wellfleet Bay is an additional hook of land within Cape Cod Bay, and this added level of topographic complexity is likely the reason that 60% of all mass strandings in this area have taken place in Wellfleet. Researchers have also found similarities in the substrates of areas around the world with a high propensity for mass strandings: these locations tend to have gently sloping sandy or muddy flats that may inhibit the animals' ability to navigate.
- 4. Predators:** Scientists and researchers believe that threats by predators such as sharks and killer whale (orca) may cause marine mammals to swim closer to shore where they are at increased risk of stranding.
- 5.** They might even be influenced by astronomical events. Many cetaceans use the Earth's magnetic field to navigate by detecting differences in the field's strength to find their way. Their internal compasses could be vulnerable to magnetic anomalies, of the kind caused by solar storms which may disturb the whales' ability to navigate, sending them into shallow waters where they get trapped. The large geomagnetic disruptions of the Earth's magnetic field, brought on through solar storms, could be another cause for whale beachings.
- 6.** It's possible that some stranding cetaceans are the victims of natural poisonings. The sei whales are thought to be the victims of toxins released by deadly algae, while similar

harmful algal blooms may also be responsible for the fossil whale graveyard.

- 7. Cetaceans can be disoriented by the underwater din of human activity, from naval sonar to the seismic air guns used in oil and gas exploration.** Several stranding events have been tied to military exercises near the United Kingdom, Denmark, Greece, the Canary Islands, Hawaii, and most famously, the Bahamas in 2000. As documented in *War of the Whales*, that last event led to a string of scientific studies, legal injunctions, court cases, and a formal admission of culpability from the U.S. Navy. Naval sonar is so loud that it can cause internal hemorrhaging. It could also cause gas bubbles to form in cetaceans' bodies, essentially giving them the bends – the same condition that afflicts human divers who surface too quickly. Even low levels of sonar could harm cetaceans by distressing them, forcing them to flee into unfamiliar territory.
- 8. Social structure:** Many cetaceans live in large groups. They play together, travel together, and hunt together. And perhaps, as a result, they die together. If one faltering individual, whether through confusion, sickness, injured or disoriented, the entire group may strand instead of just the one affected dolphin or whale.

#### Disposal

If a whale is beached near an inhabited locality, the rotting carcass can pose a nuisance as well as a health risk. Such very large corpses are difficult to move. The whales are often towed back to sea away from shipping lanes, allowing them to decompose naturally, or they are towed out to sea and blown up with explosives. If the carcass is older, it is buried.

#### Health risks

A beached whale carcass should not be consumed. In 2002, fourteen Alaskans ate whale blubber from a beached whale, resulting in eight of them developing botulism, with two of the affected requiring mechanical ventilation (Middaugh et al., 2003). This is a possibility for any meat taken from an unpreserved carcass.

#### Measures to protect a stranded animal

If the animal is newly stranded it may still be alive but physiological stress will be weakening the animal by the minute. Check to see if the animal is alive by watching for breathing through the blowhole at the top of its head. Whales can hold their breaths for up to 15 minutes so you may not be able to tell however if the animal is breathing immediately. Notify the local authorities so that they can call a stranding network or local veterinarian. While waiting for help to arrive, you can keep the animal's skin moist with water or by draping it with a soaked cloth. Do not splash or cover the blowhole and do make sure that the blowhole is clear of water and sand. When help arrives it is possible that they may or may not be able to save the animal. If there is no help available, allow the animal to die in peace by simply leaving it alone and allowing no other people near it. Under no circumstances should you ever try to put the animal out of its misery. Stranding is a sad but very natural part of life.

**References can be provided on request.**