Manatee mortality facts

Florida manatee mortality fast facts
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The following are commonly asked questions about manatee mortality. The answers are provided to gain insight into what we know and do not know about manatee mortality.

Q. Do most manatees die from collisions with boats?
A. No. About 25 percent of the yearly mortality of manatees results from collisions with watercraft. There are eight categories of mortality of which three categories (watercraft, flood gates/canal locks, and other human related) result from human activity. Within these three categories, watercraft-related manatee deaths constitute approximately 80 percent of the mortality.

Q. Can you tell what kind of boats are hitting manatees?
A. In most cases, no. Unless the boater or a witness reports the incident, we do not have a means of determining much about the boat. Rarely, manatees are struck and killed by ships. When this happens the results are clear. Because of the large size of the ship propeller, manatees are cut into two or three pieces. If they are crushed by a large vessel, the damage is extensive usually resulting in fracture and/or dislocation of nearly all of the ribs.

Q. What kills more manatees, propeller cuts or death by impact?
A. Death by impact kills slightly more than 50 percent of manatees killed by collisions with watercraft. Over the last ten years there has been an increase in the number of deaths caused by impact compared to propellers.

Q. Can you tell how fast the boat was traveling or its direction when it struck the manatee?
A. First, it is important to understand that unless we have a witness to provide us with critical information (less than 20 cases over the last 20 years), all that is available are the propeller cuts or scars on the animal. Over half of the watercraft-related deaths result from impact where no propeller cuts are scars are seen. Direction can be deduced to be one of two directions along the linear path of the series of propeller cuts. Speed cannot be determined because we do not know how many blades are on-the propeller involved in the collision or the engine RPMs. Without knowing the number of blades, we do not know how many cuts in the series equal a single revolution of the blade.

Q. Can you tell whether the boat was involved in commercial or recreational activity at the time of the accident?
A. In rare instances, as when a carcass has very large propeller cuts and was recovered in a port, we feel confident that a large commercial vessel was involved. Likewise, if a carcass is recovered from a shallow water area where only small boats usually involved in recreational activity can operate, then it is reasonable to assume recreation was the primary activity, but at best this information is vague. One problem is that smaller boats used for recreation are generally not excluded from operation in ports. Propeller cuts or scars on a carcass do not indicate the

function of the boat involved. Unfortunately, boaters rarely report striking a manatee and so for the vast majority of watercraft-related deaths where the propeller strike killed the animal, we have minimal information. For those animals killed by impact, we have even less. We can determine that the boat was large or small but specifically how large is not possible. Further, the potential is the same for powered boats of nearly all sizes to strike and injure or kill manatees regardless of whether the boats are involved in commercial or recreational activity.

Q. Is there a correlation between the number of registered boats in Florida and the increase in watercraft-related manatee mortality over the last twenty years?
A.There is a positive numerical correlation between annual boat registration and watercraft-related manatee mortality. The majority of boats registered in Florida are classified recreational by their owners at registration. However, as with any statistical correlation, its validity must be determined in relation to reality. Boat registration does not equal boat operation. Of all the registered recreational boats in Florida, we do not know how often the boats are used throughout the year. We suspect that the majority are used only occasionally (less than a dozen times a year). In addition, regional location of watercraft-related mortality is influenced both by the location of concentrations of manatees and concentration of boats as well as other factors.

Q. If water-control structure gates and canal lock gates move so slowly, how do manatees become trapped in them?
A. First, manatees appear to be attracted to these structures by sound. Manatees move through these structures all the time, and they queue up at the gate when they hear it begin to operate. When an animal is attempting to pass through a flood control structure, it can become pinned either by the gate or by the pressure of water rushing through the small opening. To our knowledge, no one has ever witnessed an animal negotiating a structure, becoming pinned, and being crushed or drowned.

Q. What about pollution? Isn't that what's really killing manatees?
A. Since the beginning of the manatee mortality program, there has never been a documented die-off of animals as a result of a chemical spill. There was a die-off of 41 manatees in the spring of 1982 that was attributed to exposure to a biotoxin. The toxin was the natural product of marine micro-organisms (red tide) and was not man-made. Over the last 20 years studies have been conducted which measured the concentrations of heavy metals, pesticides, and herbicides in dead manatees. Copper was the only metal with a substantial tissue concentration. This lead to the more strict controls of copper herbicides for aquatic weed management. Although DDT, 000, and dieldrin were found in manatee tissues, they were not found in dangerous concentrations. All other organic compounds were not found in concentrations greater than minimal detectable limits of the analysis.

The necropsy program continues to collect manatee tissues for analysis. Analyses conducted over the last few years revealed a decrease in the concentration of copper but little change otherwise. It appears that, so far, manatees are not affected by chemical pollution.

Q. What about perinatal or new-born manatee mortality?
A. First, two definitions. As far as the mortality records are concerned, perinatal manatees are those animals that are less than 150 cm (60 inches) in total length that did not die from human

related causes. The term perinatal refers to the day before and following birth. The average length of a new calf is 125 cm (50 inches) but we have removed some calves from their mothers at necropsy that were 152 cm (65 inches). Preliminary findings of a study examining the teeth of perinatal animals recovered over the last two years suggest that there has not been any post-natal tooth development. This means that the carcasses we recover and classify as perinatal based upon their body lengths are truly new-born animals.

Unfortunately approximately 60 percent of the perinatal carcasses collected each year are too badly decomposed to make an accurate determination of death (aside from obvious trauma). Forty percent of the recovered calves died from diseases or still birth (which is often caused by infectious agents). Disease causing bacteria are often found in these animals. There is presently no means of isolating viruses from manatees yet, but it is an avenue of research we are pursuing.

Wild marine mammals are most vulnerable to death as new-borns. There is substantial evidence of this in populations of whales and dolphins as well as seals and sea lions. Perinatal manatee mortality is a complex subject. The following are several sources of perinatal mortality:

A- Pregnant females seek quiet water secluded from the activity of other manatees in order to have their calves. A new-born animal is disoriented to the point that it cannot distinguish the bottom from the water surface. It can only swim with its flippers and the mother must push the new-born to the surface so it can take its first breath. In this condition, the calf could be easy prey for large predators such as alligators, snapping turtles, and sharks.

B- There is evidence that inexperienced (first time pregnant) mothers may abandon their calves. This situation is not unique to manatees, but is well known in many mammal species.

C- Post-partum females quickly cycle back to reproductive activity. Manatee breeding is a tumultuous affair with the pursuit of the female by several males and multiple breeding. A cow-calf pair could become easily separated by bulls pursuing the female. Because the pursuit could last several days, the opportunity for the cow to lose her calf is great.

D- Female manatees have one teat located at the base of each flipper. Manatees encounter rope, monofilament fishing line, and crab pot float lines, etc., that wrap around their flippers and constrict them. The constriction causes a swelling of the flippers to enormous proportions preventing the calf access to the teats for nursing.

E- The normal mammary glands of lactating (milk producing) females are small. In addition, the reservoir of milk available to the calf at any time is small (large coffee mug full) and for this reason calves nurse frequently. We have observed apparently healthy mothers that had only one functioning mammary gland. This condition reduces the mother's ability to support her calf by half.

F- Cold winters are difficult for manatees, especially pregnant females. If the winter is unusually cold or cold for a long time, the mother may survive but not have the energy store to support the calf.

G- We have recovered carcasses of adult females that had recently calved and were lactating at death. Tragically, in nearly every case, we did not find the calf, alive or dead. It is one of the most frustrating situations we encounter in the rescue and recovery program. Although numbers of deaths of perinatal manatees and manatees killed by watercraft have been similar in recent years, there is not enough information to conclude that calves found alive or dead resulted from the deaths of their mothers by boats. Boating activity may contribute to harassment and death of baby manatees but there is no means of measuring this effect. Modern propeller-driven boats can operate in shallower water at higher speeds. The recent rapid increase of high-speed jet boats that operate in very shallow water may pose threats that did not exist five years ago.

Q. What about pollution and the increase in perinatal manatee mortality?
A. As with adult manatees, we have not found chemicals at toxic levels in perinatal manatees. We have tested all the fresh perinatal carcasses over the last two years and will test more over the next three years. In addition, we have not discovered major deformities or tumors in calves. We continue to collect tissue samples for analysis.

It is important to stress that a calf is most vulnerable to toxic effects during early development. Most toxins have their greatest effect at that time. As a result, the embryo can be reabsorbed and is never born. Further, exposure of the mother to toxins that affect reproduction most often results in her failure to conceive. Other toxins may affect the male's ability to produce sperm or deform the sperm, resulting in ineffective breeding. All of these affects result in fewer calves born, not in an increase in perinatal mortality.

We can examine the condition of sperm from fresh carcasses but we have to be careful how we interpret the results as anoxia and early decomposition can alter sperm, falsely suggesting deformity. We are not aware of attempts to collect sperm from living captive males. Ovary condition in the female can only be determined via laparotomy which is a risky surgical procedure. The information gained from the procedure does not warrant the risk and would require a federal permit.