

A15/ER/ALL/12

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Rinaldi and Rinaldi



INTERNATIONAL
WHALING COMMISSION

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Caroline Rinaldi and Renato Rinaldi

Association Evasion tropicale, Musée *Balen Ka Souflé*
Rue des Palétuviers
97125 Bouillante, Guadeloupe, France

ABSTRACT: Entanglements are a cause for growing concern for many cetacean populations worldwide. The present note reports on a sperm whale calf entangled by its tail fluke peduncle in a mass of ropes, nets and plastic cans, that a mature female had taken by the opposite end with her lower jaw. The calf was dead and the female was able to perform foraging dive cycle with other members of the social group with the calf carcass attached to her jaw. The rescue team was able to disintegrate the calf body to reduce drag effect on the female. Since then, the female has regularly been observed, her body condition and activities being apparently normal. However it is unknown if she was able to free herself from the ropes and nets attached to her jaw. It is hypothesized that the primary cause of the entanglement was by playing with local artisanal Fish Aggregating Devices (FAD) as occasionally observed in the area.

Key words: sperm whale – entanglement – Caribbean – Fish Aggregating Device

INTRODUCTION

Entanglement is a growing cause of concern for cetaceans worldwide. Various bodies and organizations, including IWC, encourage (1) the reporting of every case of cetacean entanglement in order to better understand the extent of the problem, its ways of actions and effects on populations; and (2) the development of mitigation actions such as preventing rope and net discard at sea, developing entanglement-proof devices and developing safe methodologies for disentangling large animals. The present paper reports on a case of sperm whale *Physeter macrocephalus* entanglement and the subsequent disentangling attempts in Guadeloupe, French West Indies. The event described here occurred immediately after the large whale disentangling training workshop that was conducted by David Mattila and Doug Sandilands at St Martin, 11-14th of November 2013.

DISCOVERY AND ASSESSMENT OF THE SITUATION

Maternal groups of sperm whales are known off the Caribbean side of several islands of the West Indies. In Guadeloupe, these groups are subject to continuous monitoring and photo-identification by *Association Evasion Tropicale* (AET) since 1998.

On November 15th, 2013, 7 whales were observed in 2 clusters (n=3, n=4) including females, juveniles and calves, blowing and apparently socializing at the surface. A few of them dived for foraging and others stayed at the surface or shallow dived. When three individuals surfaced, it appeared that one of them was trailing a dead calf. This animal was a mature female photoidentified since 2005 in a well-known local group reported from the area since 2000. We have no independent evidence however whether she was the mother of the dead calf. The whale fluked up atypically when deep diving and pulled the calf with her (Figures 1 to 3).

The calf was entangled by its tail fluke peduncle in a mass of ropes, nets and plastic cans, that the female had taken by the opposite end with her lower jaw. While the entanglement of the calf was likely incidental, it is unclear if the female also got incidentally entangled as a result of her interactions with the calf or if she voluntarily grasped the ropes and nets in a similar behaviour as often reported when female odontocetes carry their dead calf for some times after its death.



Figure 1: surface view of the group of three sperm whales; the inflated calf is visible behind the female. An immature is closed to them.



Figure 2: underwater footage showing how the female sperm whale pulled the dead calf attached to elements of ropes, nets and plastic cans.



Figure 3: despite the likely massive drag effect due to the calf carcass, the female sperm whale continued her cycle of deep dives for foraging

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DISENTANGLING ATTEMPTS

The rescue team had just attended a training session for this kind of emergency situation the days before the event (joint IWC-CAR SPAW workshop, Saint Martin, 11-14 November 2013), but the dedicated tools were not immediately available on site.

1. **Rescue day 1, trying to catch the lines** - As the cluster surfaced, the rescue team tried twice to catch the ropes between the female sperm whale and the calf with a grapple (dinghy anchor available on board) attached to fender buoys, without success (Figure 4).



Figure 4: attempt to catch the ropes by using a grapple in order to cut the ropes.

2. **Rescue day 1, gaffing the dead calf** - As the female and calf and two other individuals surfaced after a shorter time underwater (30 minutes), it was decided to hang buoys available on board (fender buoys, safety jackets, cans) on the calf with two gaffs in order to slow down the whale close to the surface and facilitate calf carcass disintegration during deep dive and consequently set the female free of the calf body (Figure 5).
3. **Rescue day 1, taking advises** - Back to land at night, the rescue team exchanged by e.mail with David Mattila for best practices regarding the event.
4. **Rescue day 2, monitoring** - Early in the morning the female sperm whale and the dead calf were found. The calf body was partly disintegrated with only a large piece of blubber still attached to and pulled by the female sperm whale. When diving, the female was able to better close the jaw than the day before, probably as a result of decreased drag effect from the calf remains. An immature whale permanently hanged around the female. Dives and sequences at the surface were regular, but the female remained very stressed. The rescue team decided to stop monitoring.
5. **Rescue day 4, monitoring** – On Monday 18th, the group was not encountered on site. Back to port early in the day, the team prepared tools to try to cut the ropes and nets, with advises from David Mattila and the IWC experts group.
6. **Rescue day 5, monitoring** - On Tuesday 19th, the entangled whale was always encountered at some distance from the vessel and the female was very stressed and actively tail slapping when approached. The rescue team kept at some distance and no new attempt to get closer to the group of whales and cut the rope was made. Activities of the female and the other members of the group were monitored all day long.



Figure 5: Attaching floats to the calf body in order to trigger its disintegration during dive, hence freeing the female..

POST DISENTANGLEMENT MONITORING

The female sperm whale was observed the following days with a line of oil in her wake and with parts of the calf in advanced decomposition. She remained heavily stressed, possibly as a result of the entanglement event, the disentangling attempts and the presence of predators attracted by the calf body. Since then, the female has regularly been observed with her group, foraging, socializing, or associated to a mature male. Her dive fluking up remained somewhat atypical, likely because of the rope and net parts still attached to her jaw. No additional footage could be made, but her body condition looked normal.

DISCUSSION AND CONCLUSION

From 1998-2009, only one case of entanglement (pan-tropical spotted dolphin, *Stenella attenuata*) was reported by the Guadeloupe Stranding Network. Since 2010, six entanglement cases were reported, including 3 humpback whales *Megaptera novaeangliae*, 2 sperm whale (n=2) and 1 Cuvier's beaked whale *Ziphius cavirostris*. Most of them were recorded during AET's monitoring field work, with approximately the same amount of time spent in effort each year suggesting that entanglements would become more frequent in this area.

The origin of the mass of ropes and nets that was the primary cause of the entanglement could not be determined with any level of confidence. However, its composition is suggestive of material commonly used in the manufacture of artisanal fish aggregative devices (FAD) in Guadeloupe and the West Indies. The traditional type of FAD is made of discarded ropes and pieces of nets, coconut palms, canvas covers, and a variety of second hand floats including plastic cans and pieces of wood. This has to be linked to previous observations and video footages (AET, unpublished material) showing that resting sperm whales spend time interacting with these objects, biting the floats, pulling the ropes and net pieces, rolling against the devices etc... More recent types of FAD are specifically manufactured and seem to be less attractive to sperm whales.

If this explanatory hypothesis for a possible cause of entanglement was true, it would be the first case of large whale entanglement in this category of fishing gear.

ACKNOWLEDGMENTS

We would like to warmly thank David Mattila, the IWC experts group, the French Stranding Network Observatoire *PELAGIS* and the members of the rescue team their advises and help in this difficult situation.