RECORDS OF COLISIONS BETWEEN LARGE VESSELS AND SOUTHERN RIGHT WHALES (*Eubalaena australis*) IN URUGUAYAN WATERS, 2003-2007

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ABSTRACT

Between 2003 and 2007, seven Southern right whales (*Eubalaena australis*) were recorded with large wounds due to collisions with large vessels along the shallow coastal waters of Uruguay. These cuts were located in the supra-occipital, cranial, caudal and dorsal zones of the whales' body. Most records were post mortem, and the observed moderate decomposition revealed a recent death and a high probability of occurrence in Uruguayan jurisdictional waters. According to their dimensions, the wounds corresponded to propellers cut of large vessels. The dates of the records were found to be consistent with the seasonal presence of *E. australis* in shallow waters (June – November), when the species mates and breeds. Besides other preventive recommendations, it is proposed to consider the period August - October as a "High Risk Time for Collision" in Uruguayan waters.

Key words: Atlantic ocean, Cetacea, Conservation, Uruguay, Ship strikes, Stranding.

INTRODUCTION

The collisions between whales and ships have been reported since long time ago. However, the increased maritime traffic, size and speed of boats is a matter of increasing concern (Laist *et al*., 2001; Dolman *et al*., 2006). Although any type of ship can collide with a whale, large vessels (80 m or more) are causing more severe damage and even death (Laist *et al*., 2001; Jensen & Silver, 2004).

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Ship-strikes usually occur near coastal areas, where the greater concentration of cetaceans (breeding or feeding areas) and vessel traffic tend to overlap (Laist *et al*., 2001). Therefore, due to their coastal habits, species such as right whale (*Eubalaena australis* and *E. glacialis*), humpback whale (*Megaptera novaeangliae*), fin whale (*Balaenoptera physalus*), dwarf minke whale (*B. acutorostrata*), blue whale (*B. musculus*) and sperm whale (*Physeter macrocephalus*) are vulnerable (Laist *et al*., 2001; Jensen & Silver, 2004; Van Waerebeek *et al*., 2007).

However, right whales may be more vulnerable to ship strikes than other species because of their behavior. They spend much time on surface for resting, mating and breeding, and this may mean that during such activities these whales are less attentive to surrounding activity and noise, or they are so habituated to them that do not detect the approach of the vessels (Laist *et al*., 2001; Van Waerebeek *et al*., 2007). Therefore, this species has been reported as the most severely affected (56 cases of collision) in the Southern Hemisphere (Van Waerebeek *et al*., 2007). In the case of the northern right whale (*E. glacialis*), ship strikes also have a great impact which affects the recovery of the species (Kraus, 1990; National Marine Fisheries Service, 1991). As an example, between 1990 and 2006, 22 such whales (44%) were killed by collisions (Marine Mammal Commission, 2007).

In the coastal marine area of Uruguay, the Southern right whale (*E. australis*) is one of the most common cetacean species during winter and spring (June to November). Unfortunately, despite legal regulations there are documented cases in the country revealing collisions between whales and large vessels. The collection of such cases is presented in this paper.

METHODOLOGY

For the purpose of this review, a collision is defined as a strong impact with any part of a boat (commonly the bow or the propellers) and a live whale, causing physical trauma or even death of the animal (Van Waerebeek *et al*., 2007).

We undertook a compilation of information about cases that demonstrated collision between large vessels and right whales (*E. australis*) in Uruguayan waters, and performed their respective description.

The information sources used were: the authors' own records, the national stranding network database (Dirección Nacional de Recursos Acuáticos, DINARA), the Museo Nacional de Historia Natural, the Museo del Mar de Punta del Este and the Centro Interpretativo Marino Costero collections. Information was Only considered when supported by graphic record and/or specimen collection.

RESULTS

For the period 2003-2007, seven cases of collisions between whales and vessels were documented.

Case 1:
On October 16, 2003 a male specimen of *E. australis* (TL: 9.50 m) beached dead in José Ignacio, Department of Maldonado (34º 49' 30'' S; 54º 37' 00'' W). The carcass exhibited deep incisions in the rostrum and a complete section of the left jaw (Fig. 1). Small samples and photographs were taken and deposited as PFM 045 in the DINARA.

Figure 1 *E. australis* of José Ignacio, Department of Maldonado. Lateral aspect of the right side of the head.

Case 2:

Simultaneously with the previous case, another dead male of *E. australis* (TL: 11.00 m) was recorded in Las Garzas Beach, Department of Rocha (34º 36' 05'' S; 54º 26' 04'' W). The skull of this animal presented a deep straight saw-like cut that almost divided the skull in two halves. This specimen is exhibited in the Museo del Mar de Punta del Este as MMPE 053.

Case 3:

On July 13, 2005, a dead specimen of *E. australis* (TL: ca.11 m) was recorded in Chihuahua Beach, Department of Maldonado (34º 52' 30'' S; 55º 06' 00'' W). The carcass was lacking the caudal fluke and peduncle, which was sectioned by a sharp blade. The frayed rostrum and the postmortem loss of the epidermis gave to the specimen the appearance of a giant squid. Small samples and photographs were taken and deposited as PFM 060 in the DINARA.

Case 4:

On August 23, 2006, a carcass of *E. australis* (TL: 12.40 m) in advanced state of decay was recorded in Laguna de Rocha, Department of Rocha (34º 40' 87'' S; 54º 16' 62'' W). A major incision at the caudal peduncle was observed. Small samples and photographs were deposited in the Centro Interpretativo Marino Costero.

Case 5:

On October 18, 2006, a live female *E. australis* with a calf were observed in La Paloma, Department of Rocha (34º 42' 00''S; 54º 09' 00''W). The female exhibited five slashes (250 - 300 cm) parallel to each other on the back and other cuts on the left side of the caudal peduncle. This whale has not been sighted again (Fig. 2). The complete graphic record was deposited in the office of OCC.

Figure 2 *E. australis*. Female with 5 cuts parallel to each other and perpendicular to major axis caused by propellers (at the left of picture is the whale head).

Case 6:

On July 25, 2007, a stranding of a dead young *E. australis* (TL: 5.70 m) was registered in Palmares de la Coronilla, Department of Rocha (33º 54' 30'' S; 53º 30' 10'' W). The carcass presented the fluke partially sectioned (Fig. 3). Small samples and photographs were taken and deposited as PFM 128 in the DINARA and as MNHN 6108 in the Museo Nacional de Historia Natural.

Figure 3 *E. australis,* young whale with sectioned fluke.

Case 7:

In the winter of 2007, a live specimen was sighted and photographed in La Paloma, Department of Rocha (34º 42' 00''S; 54º 09' 00''W) with a cut in the caudal zone. It also showed other deformations or injuries (Fig. 4). The complete graphic record was deposited in the Centro Interpretativo Marino Costero.

Figure 4 *E. australis* sighted in La Paloma, Department of Rocha. It is shown a deep incision in the caudal zone.

DISCUSSION

The actual frequency of collisions between boats and whales in Uruguay is surely higher than that observed. If we take into account the carcasses lost at sea, the nonlethal collisions and the frequent inability to perform complete necropsies, the number of cases presented here must be considered as a minimum. For these reasons, the impact that the collisions are producing on the population of right whales in Uruguayan waters cannot be comprehensively assessed.

The wounds resulting from a collision between vessels and cetaceans can be of two types, namely blunt trauma and lacerations from propellers (Laist *et al*., 2001). The blunt trauma is usually not easily visible, because it causes internal damage such as fractured bones of the skull, jaws or vertebrae, as evidenced in case 2.

Conversely, wounds caused by propellers result in deep parallel cuts which may penetrate the blubber layer on the dorsal surface of the animal or sever tail stocks (Laist *et al*., 2001), as evidenced by cases 1, 3, 5, and 6. This confirms that the cases presented in this article resulted from collisions with vessels.

In most cases it is evident that the collision occurred when the animal was still alive. For example, the propeller marks and bruises were observed in dorsal regions (cases 3 and 5) and head (cases 1 and 2). When the animal is dead at the time of the collision, the injuries are usually observed on the opposite side, because they tend to float with the ventral side up (Laist *et al*., 2001). In the cases 4 and 6, which present injury in the caudal region, we cannot be assured that the animal was alive at the time of the collision.

Both cases 5 and 6 show that the preference of mothers with calves to inhabit shallow waters during the breeding season (Félix & Haase, 2005) makes them even more vulnerable to collisions. They also spend time on the surface due to the need of the calf to breathe frequently in the first weeks of life, or by increased playing activities in the coming weeks (Thomas & Taber, 1984).

Because of the moderate state of decomposition in most carcasses, we can assume that the majority of collisions occurred in Uruguayan waters.

The stranding and sighting dates presented here are consistent with the highest concentrations of whales reported for Uruguayan coastal areas (August – October). Besides abundance, the type of behavior displayed (mating, breeding and playing activities) impairs the whales' alertness to the environment (Laist *et al*., 2001).

It is not possible to provide details of any kind with regard to the craft responsible for reported collisions. Due to the large variety of vessels transiting Uruguayan waters and the reluctance of captains to report this kind of accidents, the affected whales remain the only source of information. However, by the length and depth of cuts observed in several specimens, it is clear that they were caused by large vessels.

CONCLUSIONS

Seven records of collisions between large vessels and Southern right whales are reported for Uruguayan waters in the period 2003 – 2007.

The type of wounds and the dates of the records are consistent with collisions of large vessels with living whales during the mating and breeding season of the species.

The moderate decay in beached specimens indicates that the collisions occurred in Uruguayan waters.

August to October should be considered as "High Risk Time for Collision" for whales, due to the high concentration of these animals in Uruguayan coastal areas.

RECOMMENDATIONS

- Maintain the continuity of systematic recording of sighted and stranded cetaceans to gather accurate information about the animals affected by collisions.
- Integrate and analyze information about Southern right whale populations at high risk of collision with vessels in a regional context.
- Undertake educative campaigns aimed at sailors, fishermen and inhabitants of coastal communities about the potential danger of collisions, both for whales and for themselves.
- Promote regulations to reduce the speed of craft in coastal areas or in areas and seasons of known risk.
- Establish warning procedures or surveillance networks to warn vessels by radio when there are groups of whales near the coast.
- Promote interdisciplinary work to determine the acoustic characteristics of our waters in relation to maritime traffic.
- Monitor compliance towards approach procedures (distances and speeds) in whale watching activities.
- Request reports to the vessels about the occurence of collisions with whales, when they reach port.

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