



## Harpooning and entanglement of wild dolphins in the Pacific coast of Guatemala

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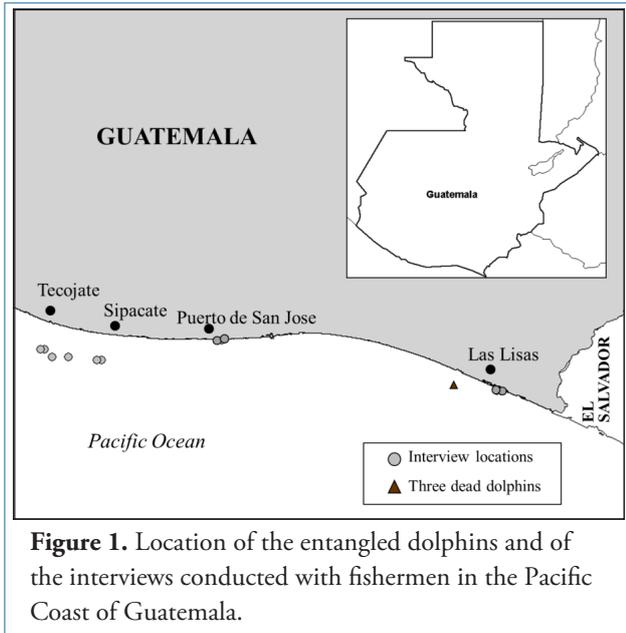
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Due to their close proximity to humans, coastal cetaceans are particularly vulnerable to mortality from incidental killing in fishing gear and directed hunts (Reeves *et al.*, 2003). This note documents two situations affecting populations of small cetaceans in Guatemala: incidental entanglement in fishing nets and intentional harpooning. Hunting and intentional capture of marine mammals is illegal in Guatemala (Ley de Pesca y Acuicultura, Decreto 80-2002), and the fine for breaking the law is US\$1,000 to US\$10,000. Interviews were conducted with 10 local fishermen along 117km of the Pacific coastline (Figure 1). I first interviewed four fishermen who had previously worked with me and recruited two of them to help me interview six other fishermen. The interviews included general questions about the men's fishing practices (*i.e.* target fish species, amount of fish presently caught compared to other years, quality of the fishing compared to other years), as well as specific questions about hunting and incidental entanglement of dolphins (*i.e.* Have you harpooned dolphins or have you heard of anyone who has? Have dolphins ever been caught in your net? How many?).

Fishermen were very cooperative when responding about their fishing practices, but were more cautious in regards to hunting and incidental entanglement. Those who already knew me were keener on providing detail about harpooning than were the other interviewees. The responses of six fishermen suggest that harpooning is used in certain towns, particularly when fishermen do not have enough bait to catch sharks and/or when sharks do not seem to be attracted by non-dolphin bait. Shark fishing, the dominant type in some coastal towns of Guatemala (Jolón-Morales *et al.*, 2005), is largely done using a 'cimbra' (*i.e.* a pelagic longline with a

variable number of hooks that can be up to 10-15km long), which can use a combination of different baits. According to the interviewed fishermen, when using exclusively dolphin meat bait, a cimbra might imply the killing of as many as three non-calf dolphins. Harpoons used to kill dolphins are long metal bars approximately 2m long (Figure 2) with a detachable sharpened head. In 2005, 353 fishermen were registered to have at least one cimbra along approximately 255km of coastline, and it was estimated that approximately 468,735 pounds of shark were caught annually (Jolón-Morales *et al.*, 2005). Reportedly, at least two dolphin species are targeted: the 'while belly dolphin' (name provided by the fishermen, possibly referring to *Stenella longirostris* or *S. coeruleoalba*) and the bottlenose dolphin *Tursiops truncatus* (Culik, 2004).

Six fishermen responded that they have either witnessed or heard of dolphin incidental entanglements. On 14 March 2009, three dead dolphins were found entangled in a 'ghost' fishing net (gill net) approximately 200m long and a 3.5in square mesh. According to the fisherman who helped me examine the carcasses, that type of net is used illegally to capture swordfish (*Istiophorus platyterus*) in offshore waters. However, in this case it was found at about 6.5km from the coast (Figure 1), where it probably arrived driven by the sea currents. Two of the dolphins, a male and a female, were in an advanced stage of decomposition and were tentatively identified as *Tursiops truncatus*. Based on their size (250-270cm), they were probably adults. The third dolphin was a fresh carcass that probably became entangled on the day of discovery. A necropsy revealed that this was a juvenile female *T. truncatus* 204cm long in apparent good health, based on



blubber thickness, presence of food in the stomach, and appearance of internal organs. Juvenile status was based on length (Perrin and Reilly, 1984; N. Barros, pers. comm.). A few days after the incident, another fisherman reported having seen at least 10 more dead dolphins in another location, not entangled and approximately 18.5km from shore. Reportedly, the carcasses were found in an advanced stage of decomposition making impossible the identification of the species involved.

The information provided above, despite being mostly based on data collected opportunistically, provides evidence and raises the alarm on the occurrence of a potentially important threat for small cetaceans in Guatemalan waters. There are no estimates of total mortality, so the effects of entanglement or harpooning on local cetacean populations are unknown. Abundances of the most common dolphin species in the Pacific Guatemalan Economic Exclusive Zone (*T. truncatus*, *S. attenuata*, *S. longirostris*, and *Delphinus delphis*) range from about 30,000 to 14,000 animals (Quintana-Rizzo and Gerrodette, 2009). It is unknown if these populations are decreasing or increasing locally, but they are classified as 'least concern' or 'data deficient' according to the 2008 IUCN Red List of Threatened Species. At a global level, *T. truncatus* is affected by incidental take throughout its range and by the directed fishery for food in Japan and other countries (Culik, 2004). In the eastern tropical Pacific Ocean, the stocks of *S. attenuata* and *S. longirostris* have been reduced due to the dolphin bycatch in the purse-seine fishery for yellow fin tuna and neither stock shows signs of recovery (Gerrodette and Forcada, 2005).

In Latin America, incidental mortality of cetaceans in artisanal fisheries seems to be widespread as they have been reported not only in Guatemala (this note) but in several other countries including Argentina (Reeves *et al.*, 2003), Brazil (Loch *et al.*, 2009), Chile (Perrin, 1985; Goodall *et al.*,

1988), Colombia (Ávila *et al.*, 2008), Costa Rica (Palacios and Gerrodette, 1996), Dominican Republic (Vidal *et al.*, 1994), Ecuador (Palacios and Gerrodette, 1996), Honduras (Vidal *et al.*, 1994), Mexico (Vidal *et al.*, 1994; Palacios and Gerrodette, 1996), Panama (Vidal *et al.*, 1994; Palacios and Gerrodette, 1996), Peru (Read *et al.*, 1988; Félix and Samaniego, 1994; Mangel *et al.*, 2009), Uruguay (Franco-Trecu *et al.*, 2009) and Venezuela (Trujillo *et al.*, 2010). The use of dolphin meat as bait seems to be less common as the reports come from fewer countries. However, direct killing has been identified as a serious threat for some dolphin populations (Trujillo *et al.*, 2010). Similarly to Guatemala, dolphin meat is used as shark bait in some countries but it is also used as bait for either Mota fish (*Calophrysus macropterus*), crabs, or scavenger catfishes in others: Brazil (shark bait, Canella and Ximenez, 1990; Mota fish bait, Loch *et al.*, 2009), Chile (crab bait, Goodall *et al.*, 1988; Perrin, 1985), Colombia (shark bait, Avila *et al.*, 2008), Panama (shark bait,



**Figure 2.** Top: Metal harpoon use to kill dolphins for shark bait along the Pacific Coast of Guatemala. The person standing in the photograph is 162cm tall. Bottom: The head of the harpoon is approximately 18cm long. Photographs by Ester Quintana-Rizzo.

Vidal *et al.*, 1994), Peru (shark bait, Alfaro Shigueto, 2008) and Venezuela (scavenger catfish bait, Trujillo *et al.*, 2010). Additionally, dolphin carcasses are used opportunistically as bait or even for consumption (Culik, 2004; Avila *et al.*, 2008). The cetacean species affected by direct kills or incidental catches seem to vary from country to country and a total of at least fourteen species seem to be affected in Latin America: bottlenose dolphins, common dolphins, spotted dolphins, spinner dolphins, tucuxis, vaquitas, botos, Clymene dolphins, Risso's dolphins, orcas, pygmy sperm whales and gray whales (Vidal *et al.*, 1994).

The documentation provided here on the existence of entanglement and harpooning in Guatemala should lead to further studies to assess their impact on local dolphin populations. The 2002-2010 Conservation Action Plan for the World's Cetaceans (Reeves *et al.*, 2003) recommends the investigation of the threats and the evaluation of the extent to which cetaceans died as a result of fisheries interactions. In this regard, the plan encourages managers and decision-makers to incorporate marine mammal bycatch monitoring and reduction into their fishery management. Fisheries catches and by-catches are not currently monitored in Guatemala and many species seem to be affected by overexploitation (Jolón-Morales *et al.*, 2005). Additionally, existing laws need to be reinforced and environmental education programs should be developed and directed at towns where hunting occurs. Some fishermen hunt dolphins for bait because they are unaware that it is illegal - no one has ever been fined for intentionally killing any marine mammal, even endangered species such as manatees, in the country. Thus, a single strategy cannot solve complex problems and managers and decision-makers need to use a multifaceted, adaptable approach that is tailored to the specific conditions of the country.

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