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Rescue and Release of Two Estuarine Dolphins (*Sotalia fluviatilis*; Gervais, 1853) Found Confined in a Natural Pool of the Cachoeira River, Ilhéus, Southern Bahia, Brazil

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Abstract

The estuarine dolphin, *Sotalia fluviatilis*, is one of the least known delphinids distributed on the Brazilian coast, and it is considered to be "insufficiently known" by the World Conservation Union (IUCN, 2000) and the Action Plan for Aquatic Mammals of Brazil (IBAMA, 2001). On 1 March 2003, two estuarine dolphins were found confined in a natural pool of the Cachoeira River, Ilhéus, southern Bahia, Brazil. They remained trapped in the pool for nine days, so a rescue was launched on 10 March 2003 to return them to deep water in the Pontal Bay, Ilhéus. Their capture was performed with a 0.9-mm nylon net, which was 120 m in length, 6 m in depth, and 80 mm in stretched mesh, through an encirclement technique. As soon as the dolphins were removed from the net, a physical assessment was performed. Both individuals were subadult males, with good body conditions, and normal cardiac and respiratory rates. During the handling process, the animals were treated preventively with 4 mg of Dexamethasone by intramuscular injection. The dolphins were released successfully next to Pontal Bay and were monitored for one hour. They found food resources soon after release, and a restranding did not occur. Although there is no evidence that they ultimately survived, since the possibility of death at sea without carcass recovery cannot be ruled out, their chances of survival increased, at least in the short term.

Key Words: estuarine dolphin, *Sotalia fluviatilis*, rescue, release, Dexamethasone, Bahia, Brazil

Introduction

The nature of live strandings and the best way to assist stranded cetaceans remains unclear and probably varies by species, location, and the event. A widely recognized problem with stranded animals is stress, which can arise for a variety of reasons and can result in shock followed by death (St. Aubin & Dierauf, 2001). A general rule of thumb is that the degree to which an animal is compromised increases with the amount of handling and the length of time that the animal is handled (Norman et al., 2004). The potentially lethal, somatic, and psychosomatic traumas induced by the handling process might be reduced through quick response and proper care, making rescue and rapid release actions an important method of assistance (Wiley et al., 2001).

In terms of assistance for live stranded cetaceans in the coast of Bahia, northeastern Brazil, such efforts are a recent endeavor. Rescues have already been done with Risso's dolphin (*Grampus griseus*; Cuvier, 1812) (Maia-Nogueira, 2000), the dwarf sperm whale (*Kogia simus*; Owen, 1866) (Maia-Nogueira et al., 2001), and rough-toothed dolphin (*Steno bredanensis*; Lesson, 1828) (Bastos et al., 2003), but no published data were found on the Tucuxi (*Sotalia fluviatilis*; Gervais, 1853).

The species *S. fluviatilis* has riverine, estuarine, and coastal marine distributions, ranging from Honduras (15º 58' N) (Edwards & Schnell, 2001) to Santa Catarina State, Brazil (27º 35' S) (Simões-Lopes, 1988). This dolphin has been listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Schouten, 1992, Appendix I) as *Sotalia* spp., and considered to be "insufficiently known" by the World Conservation Union (IUCN, 2000) and the Action Plan for Aquatic Mammals of Brazil (IBAMA, 2001).

This paper describes the rescue and release of two *S. fluviatilis* found confined in a natural pool of the Cachoeira River, Ilhéus, southern Bahia, Brazil.

Materials and Methods

On 1 March 2003, two estuarine dolphins, *Sotalia fluviatilis*, were found confined in a natural pool of the Cachoeira River (14º 47' S, 039º 06' W), Ilhéus,

southern Bahia, Brazil (Figure 1). The pool was 7 m in depth and 50 m in diameter, and surrounded by rocks that were 50 cm below the water surface during high tide. The water was muddy, and the salinity was 6 ppm. The dolphins remained trapped in the pool for nine days, apparently unable to negotiate their way back to sea. During this period, their behavior was calm, consisting of random slow movements and occasional high bursts of speed, with an average respiratory rate of 0.6 respirations/min (rpm) (Table 1). While trapped, they faced the potential threats of starvation, entanglement in fishing nets, collision with small boats, stranding, and exposure to low salinity and high acidity. In light of these threats, and because of the length time they had been there, on 10 March 2003, a rescue was launched to return them to deep water near the Pontal Bay (14º 47' S, 039º 03' W), Ilhéus. The capture was performed with a 0.9-mm nylon net, which was 120 m in length, 6 m in depth, and 80 mm in stretched mesh. Using two canoes, the net was hung inside the edge of the natural pool, surrounding the entire pool. The ends of the net were dragged to the opposite sides until the diameter was small enough to entangle the dolphins. This encirclement technique was used to capture an adult rough-toothed dolphin, *Steno bredanensis*, in the Todos os Santos Bay, Bahia, Brazil (Bastos et al., 2003). The dolphins were transported by an 3-m boat with 40 hp engine. Their stress response was monitored by behavioural assessments. In addition, to minimize capture-related stress, handling was kept to a minimum, and the animals were given 4 mg of Dexamethasone (glucocorticoid) by intramuscular injection as an anti-shock therapy. During the handling process, their natural marks were photographed for recognition in case of restranding after release.

Results

The capture activities started at 1000 h, and the first *S. fluviatilis* (CRMA #008), a subadult male, 120 cm in length, 60 kg in weight, and of good body condition, was captured at 1110 h. As soon as it had entangled, the animal was quickly supported and removed from the net, and the physical assessment was performed. Although the dolphin was excited and struggling, it had a normal respiratory rate of 2 to 3 rpm and an average heart rate of 82 beats/min after inspiration (Table 1).

At 1130 h, while the dolphin was being transported to deep water, it showed some agitated behaviour. Although the respiratory and heart rates continued in the normal ranges (Table 1), the animal appeared to be very excited, presenting burst movements and arching its body, signaling the beginning of an acute stress response. The dolphin had to be released earlier than anticipated in the river (14º 47' S, 039º 05' W) (Figure 1) at 1145 h.

At the time the first dolphin was captured, the second one started continuous whistles. The released animal, in response to the whistles, rapidly returned to the original capture location.

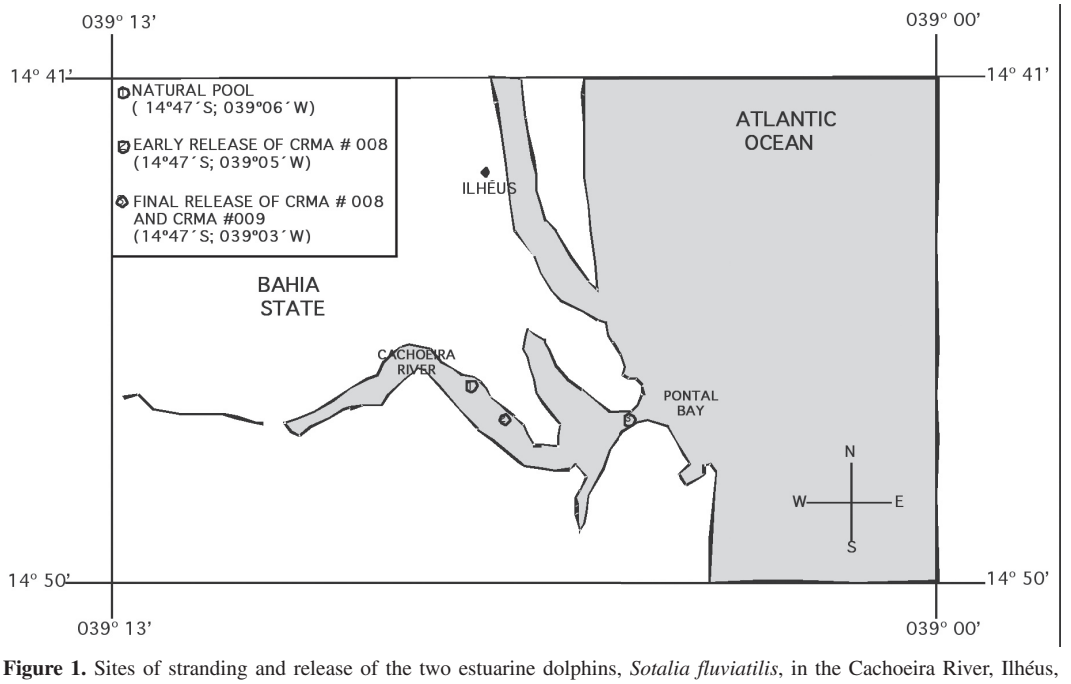

Figure 1. Sites of stranding and release of the two estuarine dolphins, *Sotalia fluviatilis*, in the Cachoeira River, Ilhéus, southern Bahia, Brazil, 2003

Table 1. Average respiratory and cardiac rates of two male estuarine dolphins during rescue in the Cachoeira River, Ilhéus, southern Bahia, Brazil, 2003, and normal ranges for *S. fluviatilis* (Edwards & Schnell, 2001) and other small cetaceans during handling process (Norman et al., 2004)

Dolphin	Parameter		Movement at capture		
			Moment prior	Moment after	During handling
CRMA #008	Respiratory rate (respirations/min)	1st capture	0.6	2-3	2-3
		2nd capture	-	2-3	2-3
	Heart rate (beats/min)	1st capture	-	82	82
		2nd capture	-	80	100
CRMA #009	Respiratory rate (respirations/min)		0.6	3-6	3-6
	Heart rate (beats/min)		-	85	95

Reference	Respiratory rate (respirations/min)	Heart rate (beats/min)
Edwards & Schnell, 2001	0.9-5	-
Norman et al., 2004	6-8	70-100

The capture activities restarted at 1210 h, and the dolphin CRMA #008 was recaptured at 1230 h. Just after capture, it still presented a respiratory rate of 2 to 3 rpm and an average heart rate of 80 beats/min after inspiration; however, during the second handling and transport, its heart rate increased to 100 beats/min (Table 1). At 1300 h, this animal was returned successfully to deep water near Pontal Bay (14º 47' S, 039º 03' W) (Figure 1).

The second *S. fluviatilis* (CRMA #009), a subadult male, 150 cm in length, 80 kg in weight, and of good body condition, was captured at 1330 h, quickly supported, and removed from the net so that a physical assessment could be performed. This dolphin appeared to be more nervous than the first animal when handled; however, it had a respiratory rate of 3 to 6 rpm and an average heart rate of 85 beats/min after inspiration (Table 1).

During transport, the dolphin kept the same respiratory rate as before, but its heart rate increased to 95 beats/min after inspiration (Table 1). At 1350 h, this animal was released successfully at the same site as the first dolphin. Some minutes later, both dolphins swam together down river, towards the Pontal Bay (Figure 1). They were monitored for one hour, and during this period, they appeared to be recovering well and found food resources soon after the release.

Discussion

The respiratory rates of both dolphins were affected by the capture process, which was signaled by the large increase from 0.6 to 2 to 3 rpm (CRMA #008) and 3 to 6 rpm (CRMA #009), respectively. Edwards & Schnell (2001) reported the normal patterns of 0.9 to 5 rpm for free-ranging *S. fluviatilis* in Nicaragua; however, Norman et al. (2004) suggested that the normal respiratory range for small cetaceans during handling process is 6 to 8 rpm. The dolphins' rates appeared to be normal for animals under stranding conditions. The heart rates were also normal, according to values for excited small cetaceans reported in Norman et al. (2004) (Table 1).

It was not possible to assess any hematological and bacteriological data on the dolphins at the time of the rescue, and it is unknown if the animals have any preexisting pathology. It was assumed by looking at the condition of the animals that both were healthy at the time of capture, and it is assumed they were stranded in the pool by topographical factors associated with navigational errors. Because of their condition, a rapid release was encouraged. The value of rapid intervention is supported by Wiley et al. (2001), who reported a high rate of survival and low rate of restranding in animals that are released quickly after capture.

Stress is a widely recognized problem for stranded cetaceans and may result in shock and death. Thus, handling and release actions must take this variable into account. Glucocorticoids can play an important role in stress response because of their immunodepressive, anti-inflammatory, and anti-shock effects (St. Aubin & Dierauf, 2001). In this case, the dolphins presented

a good stress response, which may be attributed to the combination of a rapid capture-release action, with the possible effects of the administered Dexamethasone.

Although the estuarine dolphins found food resources after being released, and restranding did not occur, this is not necessarily evidence that they ultimately survived. The possibility of death at sea without carcass recovery cannot be ruled out; however, in any stranding event, rapid intervention to reduce the impact of trauma or exposure is likely to increase the probability of survival of the stranded animal, at least in the short term, assuming that the event's cause did not include any preexisting pathology.

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