PETROBRAS WILDLIFE REHABILITATION RESPONSE AT GUANABARA BAY OIL SPILL

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ABSTRACT: *Due to an oil spill at Guanabara Bay, Rio de Janeiro, on January 18th, 2000, a large effort was made by PETROBRAS and the Museu Oceanográfico of Rio Grande (Oceanographic Museum / Centre for Rehabilitation of Marine Animals) to rescue and rehabilitate affected wildlife. With the technical support of the staff of the Oceanographic Museum two field bases were established and totally equipped for standard rehabilitation procedures. Around 200 people, including experts, volunteers, environmental agencies personnel, NGOs members and PETROBRAS employees, were involved with the rescue teams and first aid. International protocols were adapted with creativity to the situation to treat birds, most of them cormorants. 55% of the birds treated were released back in the wild by the Brazilian environmental authorities. Cetaceans were also monitored around the bay and 3 weeks after the spill, there were no signs that they have been affected. 75 dolphins that generally use the bay were often seen swimming in the area soon after the spill. Some lessons to PETROBRAS and Brazilian organizations are being discussed in this paper.*

Introduction

The rehabilitation of marine animals in Rio Grande started in 1974 by initiative of the Oceanographic Museum of Rio Grande - MOFURG. In 1997, Centro de Recuperação de Animais Marinhos – CRAM ("Center for the Recovery of Marine Animals") was built with the support of private companies, the Environmental Ministry and the International Bank of Development to attend sick, injured and oiled wildlife at MOFURG, in Southern Brazil.

In January 18th 2000, a ruptured oil duct dumped 1.3 million liters of bunker fuel into Guanabara Bay, in Rio de Janeiro, Brazil. CRAM's staff was called to the scene three days after the spill had happened, and it took thirty hours to set up a first aid station to start attending the animals in Magé District.

Birds, dolphins, fish and crustaceans were affected by the oil spill and monitored throughout the event. This paper is referred to the actions taken on the rehabilitation of the birds and the dolphin population monitored after the spill.

Materials and methods

Logistics. All the infrastructure and logistical support was coordinated and sponsored by Petrobras. The operation involved around 200 people including volunteers, several NGOs staff, specialists from research institutions, technical staff from governmental environment departments and Petrobras employees. All actions were supervised by the Brazilian environmental authorities.

The technical coordination of the rescue effort, treatment, rehabilitation and release operations of the animals was done by CRAM from MOFURG. The rescue and rehabilitation protocol followed international procedures that had to be creatively adapted for the case. Two field stations were prepared to receive the animals: one at Limão Beach (Figure 1) for first aids; and, a second station at Guaratiba Reserve - Instituto Estadual de Florestas (IEF) (Figure 2) for long term rehabilitation, aiming the release of the animals back in to the wild. The long term care center facilities were totally equipped with cages, pools, oxygen chambers, microscopes and laboratories. In both facilities, permanent veterinary care, medical supplies, nutritional support, tents, cages, water and electricity were provided to care for the birds. Food, individual protection gear and an ambulance were available for staff and volunteers.

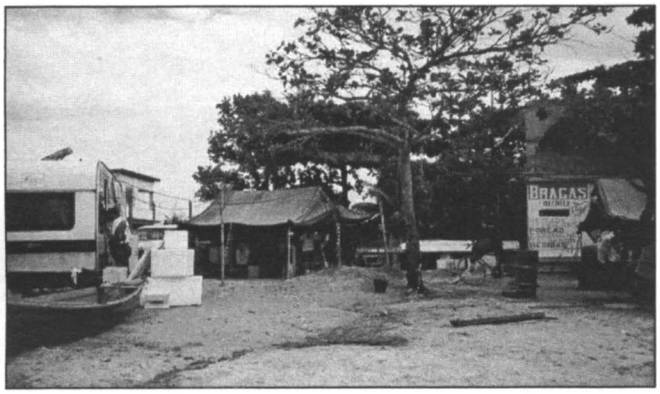

Figure 1. Field station at Limão Beach for first aid.

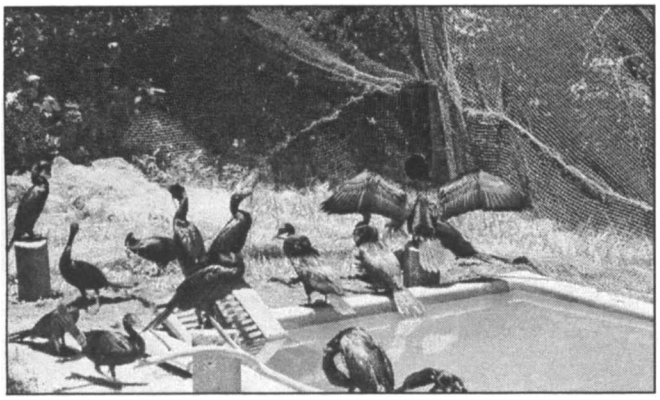

Figure 2. Field station at Guaratiba Reserve - Instituto Estadual de Florestas (IEF) for long term rehabilitation.

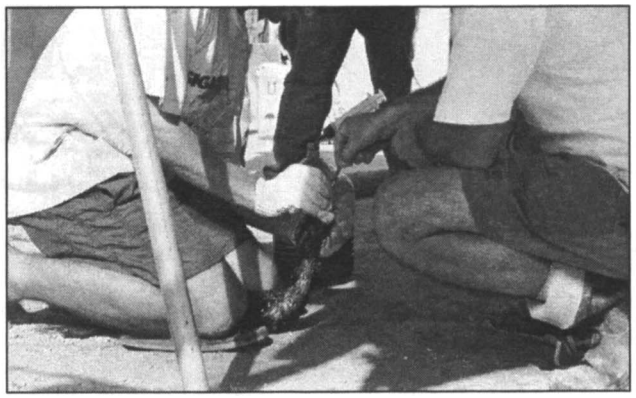

Figure 3. Medical treatment.

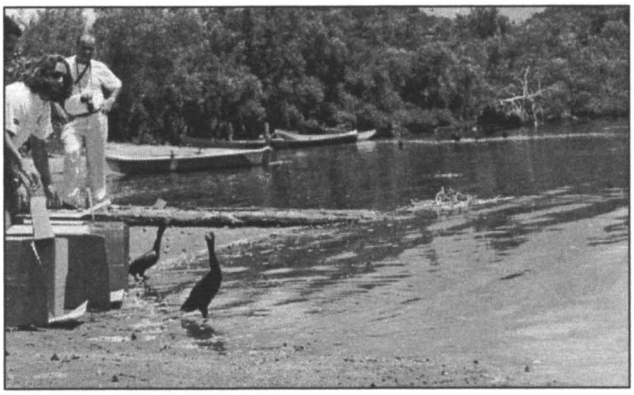

Figure 4. Release.

Field monitoring and animal rescue were coordinated by the Environmental Department of Magé District and the local NGO Harpia. Several fishing boats were equipped with first aid kits and individual protection gear.

Rescue, treatment and release. Fishermen hired by Petrobras were instructed to capture the oiled birds on the field. Oiled or intoxicated birds were recovered for 29 days after the spill. The birds were taken to the first aid station at Limão Beach (Figure 1) and attended by a rescue team responsible for the rehabilitation of the oiled fauna, these procedures were extensively described by RUOPPOLO *et al.*, 2000. Medical support included oral and subcutaneous hydration, antitoxic and antibiotic medication where indicated, warming, cleaning after stabilization, nutritional support and isolation (Figure 3). General procedures and drug dosages were used according to MILLER & WELTE (1999); POKRAS (1996); ROSSKOPF & WOERPEL (1996); RUPLEY (1999) and TSENG (1993). After three to five days the birds were transferred to the long term care facility at Guaratiba Reserve in temperature controlled vans for reducing thermal stress. In Guaratiba, they were individually identified, given de-worming drugs, housed properly, separated by species, individuals isolated and treated when necessary. The animals were monitored for 24 hours, received live and dead fish with vitamins two to three times daily.

Release took place between ten and twenty days after capture. After the evaluation of vital functions and blood parameters of each bird, following specific criteria to survival such as feathers and body condition, feeding, diving, and absence of injuries or any apparent infectious disease, the birds were banded by the Brazilian environment and wildlife authority (IBAMA/ CEMAVE), and released in to mangrove areas inside the Guaratiba Reserve and the Environmental Protected Area of Guapimirim (Figure 4).

Necropsies of the dead animals were performed by Pesagro-Rio, a state Laboratory of Animal Biology.

Concerning the resident cetaceans, their behavior was monitored by Projeto Maqua from Universidade do Estado do Rio de Janeiro (UERJ). This research group has been studying these dolphins for several years. Four land marks along the bay and two ships were used to survey the area and conduct photo-identification studies simultaneously.

Results

The number of birds collected and the general results are presented in Tables 1 and 2.

Necropsy results. Animals that died in both facilities were sent for necropsy at PESAGRO-RIO Laboratory of Animal Biology. The results indicated some of the known toxic effects of oil cited by TSENG (1999), which included alterations in the respiratory tract (edemas, congestion and hemorrhages). The gastrointestinal tract has showed gastritis and enteritis, sometimes hemorrhage, absence of stomach contents and the presence of oil; hepatic and renal problems (alterations in the volume, coloration and consistency of the organs); dehydration (urate deposits, ressecated organs); congestion of the central nervous system.

Fourteen birds were examined histologically (12 cormorants, 1 heron and 1 egret). It was evidenced hyperemia in the pulmonary, hepatic, renal and encephalic parenchymas. In the lungs, at the

Table 1. Number and species of birds collected.

Cormorants (*Phalacrocorax brasilianus*)	341 (88,1%)
Herons (*Nycticorax nycticorax; Ardea cocoi*)	14 (3,61%)
Egrets (*Casmerodius albus; Egretta thula*)	11 (2,84%)
Coots (Family Ralidae)	4 (1,03%)
Ducklings	3 (0,77%)
Sandpipers (Family Scolopacidae)	3 (0,77%)
Ringed king fishers (*Ceryle torquata*)	3 (0,77%)
Vultures (*Coragyps atratus*)	2 (0,51%)
Tern (*Sterna eurygnatha*)	1 (0,25%)
Frigate bird (*Fregata magnificens*)	1 (0,25%)
Sea gull (*Larus dominicanus*)	1 (0,25%)
Grebe (*Podiceps major*)	1 (0,25%)
Jacana (*Jacana jacana*)	1 (0,25%)
Dove (Family Columbidae)	1 (0,25%)
TOTAL	**387**

Obs.: Birds were classified according to SICK (1997) and SOUZA (1998).

Table 2. General results.

Birds collected alive	323 (83,5%)
Birds collected dead	64 (16,5%)
Survived though first aids	236 (73%)
Number of animals released	142 (44%)

wall and parabronchial atrium level was observed the presence of a black grumous pigment, suggestive of petroleum aspirate. Signs of muciparous hyperactivity of the ventriculum and pro-ventriculum mucosas, with the mentioned black pigment free in segments of the intestines of three animals examined. Vacuolar degeneration of the tubular epithelium of the renal papilla in one of the examined birds. The set of histopathological alterations is compatible with intoxication by aspiration and ingestion of an irritating substance.

The presence of parasites in a great number of necropsied birds is a common finding in wild animals. The parasites were classified as *Tetrameres* sp., *Cheilospirura hamulosa* and *Amidostomum anseris*. Two animals presented aspergillosis. A bacteria of the genus *Salmonella* was isolated from one individual.

Cetacean response. About 75 dolphins of the species *Sotalia fluviatilis* are regularly found in the bay. They swim, feed, rest and take care of their young. They have been studied by Projeto MAQUA/UERJ since 1992. In the most critical moments of the spill, the dolphins left the areas where they were commonly seen, but have returned after January 25th. Projeto MAQUA/UERJ carried out an intensive monitoring effort in early February from 4 different land marks (Forte Santa Cruz at the entrance of the bay, Forte Gragoata at the straightest part of the bay, Ponta Cruz at Paqueta Island). The supply boat Astro-Garoupa anchored on the north of Paqueta Island and 2 smalls boats were also used for the surveys. Several photographs were taken in order to photo-identify the individuals and to characterize their movements and habits. A specific contingency plan was developed by Mr. Michael K. J. Short for action during similar situations.

Discussion & conclusions

In this spill the most affected species was the cormorant (*Phalacrocorax brasilianus*) because of it's diving behaviour. It was not possible to determine the degree of impact on the local population because of lack of previous studies on the abundance and distribution of birds in the Guanabara Bay. Long term monitoring of the birds' populations were encouraged.

The time between the oil spill and the beginning of the rescue operations was too long which along with the weather instability certainly influenced the final results.

The inexistence of an emergency plan in this accident made it difficult to set up the facilities to care for the animals. Additionally, the lack of trained rescuers at the site, created the need to train teams of volunteers during the operation.

The information collected by the group responsible for the cetacean monitoring indicated that the dolphins' population of Guanabara Bay was normally using the region after two weeks. As the effects of the spill on cetaceans cannot be noticed immediately, a long and medium term monitoring effort is necessary for adequate evaluation.

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