Oil spill response in low level planning and preparedness areas: a case study

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Nightingale Islands is a small (3.2 km^2) uninhabited island which is part of the Tristan da Cunha (TdC) group in the South Atlantic. Tristan da Cunha is part of the British overseas territory of Saint Helena, Ascension and Tristan da Cunha. It is formed of four main islands, Tristan da Cunha, Inaccessible, Gough and Nightingale. Adjacent to Nightingale Island are two small islets, Middle Island and Stoltenhoff Island. Tristan da Cunha Island is approximately 18nm North of Nightingale and has a settlement, Edinburgh of the Seven Seas, of 262 inhabitants. Inaccessible Island is approximately 10 nautical miles to the North West of Nightingale and is part of a UNESCO World Heritage site. Gough is located 206 nautical miles in the South-Southeast of Nightingale Island.

Nightingale is seabird sanctuary hosting many endemic and endangered species in large numbers (more than 2 million birds) and it is rodent-free. Nightingale is, in particular, home of a significant proportion (13-18%) of the world breeding population of Northern Rockhopper penguin. The other colonies are located on other islands of the Tristan da Cunha group (on Gough in particular with 30 to 43% of the world breeding population) and on Amsterdam and Saint Paul Islands in the South Indian Ocean. Overall, 68 to 77% of the estimated breeding population is found on islands of the Tristan da Cunha group.

INCIDENT

On Wednesday 16th March 2011, bulk carrier MS OLIVA (GT 40,170) laden with a cargo of 65,000 tons of soya beans on transit from Brazil to Singapore grounded early in the morning on Nightingale Island. At the time of the incident, the vessel was also carrying 1,420 tonnes of HFO380 and 74 tonnes of Marine Diesel Oil onboard. A salvage operation was rapidly organised by the owner of MS OLIVA, and Salvage Tug SMIT AMANDLA departed Cape Town in South Africa on 17th March. Given the issue with seabirds, bird rehabilitation equipment for 500 birds was also loaded on the salvage tug and a specialist joined the salvage team. The situation regarding oiled wildlife was initially monitored by nine islanders on Nightingale. The initial report was that 20,000 to 30,000 penguins had been oiled.

On Friday 18th March, MS OLIVA split in two in rough seas spilling significant quantities of oil; the forward section became buoyant and initially floated eastwards along the northern shore of Nightingale before drifting back westwards to eventually settle on the south western shore of the island. The aft section, which includes the engine room and accommodation block, remains close to the grounding site. After a few days, both sections became almost completely submerged.

Comprehensive reports on the movement and extent of the oil spill at sea were obviously difficult to obtain due to the lack of aerial surveillance and sporadic sightings by ship-based personnel. Plotting of the movement of the oil according to the winds prevailing in the area showed that a large part of the oil that did not strand on Nightingale drifted in an eastwards direction away from the islands. However, following changes in wind direction, oil was reported to have stranded on the shorelines of Nightingale, Middle, Inaccessible and Tristan da Cunha islands.

RESPONSE

The UK National Contingency Plan stipulates that UK based agencies, the Maritime Coast Guard (MCA) and Foreign and Commonwealth Office (FCO) would offer remote advisory assistance to the overseas territories but no actual response measures.

ITOPF arrived in Cape Town on 18th March and started mounting a response plan with the local P&I Correspondent. From discussions with the island administrator and looking at the first pictures of oiling from site, a preliminary shoreline response plan was put together.

In view of the situation, plans were made to pursue the bird rehabilitation operation as well as to initiate a shoreline clean-up operation. In this respect, the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) and the French clean-up contractor Le Floch Dépollution were approached and eventually contracted. SMIT (Cape Town) provided a logistics base and response equipment and equipment for the bird rehabilitation and clean-up operations was gathered from South Africa and further specialised equipment was also air shipped from the Le Floch Dépollution facilities.

Vessels

The main challenge in this operation was to charter appropriate vessels to bring the mobilised equipment and staff to the remote islands where the incident occurs. In this respect, the UK FCO approached the South African government early on to explore the possibility of one of their Environment Protection and Fishery patrol vessel to be made available to be chartered by the owner of MS OLIVA. Unfortunately, these diplomatic efforts did not succeed. In the meantime, efforts were made to locate other vessels throughout southern Africa that could potentially be chartered to assist with the response logistics and eventually the offshore SVITZER tug MV SINGAPORE (LOA: 75m) on its way from Nambia to South Africa was located and chartered.

In order to give priority to the bird rehabilitation equipment, MV SINGAPORE was loaded with the SANCCOB equipment and 5 SANCCOB staff joined the crew and ITOPF. The equipment consisted of veterinary products, frozen fish (food), construction material, fences, tanks, heaters, washing equipment, scaled to set up a facility to rehabilitate 10,000 birds. MV SINGAPORE left Cape Town on 29th March and reached Nightingale and Tristan da Cunha on 4th April.

When MV SINGAPORE was loaded with equipment before leaving Cape Town, a Russian Polar Research and Supply vessel, MV IVAN PAPANIN (14,184 GT; LOA: 166m) returning from a support mission in Antarctica was also deemed appropriate to assist in the MS OLIVA response and eventually chartered to follow MV SINGAPORE and carry the rest of the equipment to Tristan da Cunha. The size of IVAN PAPANIN and the presence of a helipad and hanger onboard allowed the chartering of a helicopter to assist with the overall response and safety. After loading of the shoreline clean-up equipment, IVAN PAPANIN left Cape Town on 7th April and reached Tristan da Cunha on 12th April.

Bird rehabilitation

Although the initial figures of oiled birds were estimated at 20,000 to 30,000 penguins, the actual number of oiled birds confirmed as oiled and captured for cleaning was 3,718 oiled penguins and

one oiled albatross. Different facilities were set up for this purpose: a stabilisation and feeding area, an intensive care unit for the weakest birds, a washing unit and a waterproofing area. A total of 381 penguins were released, i.e. about 10% of those admitted in rehabilitation, and the albatross. Although multiple factors are involved in the high mortality rate, the fact that the birds were at the end of their three week moulting cycle during which time they had not fed and were therefore already weak when the spill occurred, together with the time necessary to mount such an operation and move the equipment to the remote group of islands are certainly aggravating factors.

Shoreline clean-up

The shoreline response equipment was selected based on the pictures seen at an early stage and discussions with the people already on site. It consisted of material known to be appropriate to deal with the clean-up of rocky shoreline such as flushing equipment, high pressure washing equipment, pumps, small skimmer heads, sorbent material, self standing tanks, waste handling material and personal protective equipment. Appropriate campsite gear and safety equipment were also part of the logistic kit. In terms of staff, a total of 6 bird rehabilitators, 4 spill responders (spill managers, mechanics...) and 6 divers formed the response team together with the ITOPF Technical Adviser deployed. A paramedic and two cooks completed the team.

Upon arrival on site, the clean-up management team undertook an aerial survey to identify priority areas and assess accessibility to the sites. From that initial survey, one of the landing sites of the penguins on Middle Island was considered to be the first priority and a clean-up worksite was set-up.

The clean-up response objective was directed at removing the threat to the wildlife of the island by removing the bulk oil on the surface rocks. Given the natural cleaning potential, the porous nature of the volcanic rock and the environmental sensitivities of the island, aggressive cleaning techniques were discounted and the response objective was not to remove all traces of oil. The initial approach in all areas was to manually scrape and recover the thick bulk oil from on and around the pebbles, boulders and bedrock. This was then followed by a combination of medium pressure flushing and high pressure washing. Sorbent boom, pads and pom-poms were used to recover the released oil and minimize oil entering the tidal pool and open sea. No detergents or degreasers were applied to the shoreline. All oily waste material generated was bagged securely and stored on the island in such a way as to minimize the risk of secondary contamination.

All of the response personnel were housed onboard the MV IVAN PAPANIN. Daily travel to Middle Island was determined by the weather conditions with rigid inflatable boats used during calmer conditions and a Bell 212 helicopter used during rough sea conditions. Medical support to the response on-site was provided by a paramedic and the helicopter remained on stand-by throughout clean-up activities to transport any personnel suffering injury (this was fortunately not required).

Whilst participating in shoreline clean-up, each worker wore a standard set of personal protective equipment (PPE). At the completion of clean-up activities each day, the workers cleaned themselves and disposed of their oily PPE to ensure that there would be no transfer of oil away from the clean-up site. A specific site was designated as a decontamination area in which the ground was protected with a plastic liner and a second layer of geo textile.

All of the oily waste collected, including bulk oil, oiled sorbent materials and oiled PPE, were initially placed into heavy duty plastic bags and sealed with a cable tie. The individual bags were then placed into a $1m^3$ capacity bulk bag. The transfer of the bulk bags from the island to the MV IVAN PAPANIN was carried out with the helicopter. Onboard MV IVAN PAPANIN, a purpose-built bunded area was constructed using layers of cardboard, plastic liner and geo textile. The edges of the bunded area were raised so as to prevent oil from escaping the area. When the bulk bags arrived onboard the vessel, they were double-bagged in plastic, sealed with cable ties and placed within the bunded area. All oily waste was disposed of in Cape Town. The total amount of oily wastes collected from Middle Island was estimated as four tons.

The shoreline clean-up activities on Middle Island began on 13th April and were completed on 22nd April. Once the shoreline clean-up of Middle Island was completed, a site visit with Tristan da Cunha's Administration was made together with an aerial survey of Inaccessible Island. After completion of the clean-up and in order to release the chartered helicopter which had other contracts scheduled, the incident response was demobilised from Tristan da Cunha on 23rd April. With still more than 1,300 penguins remaining in rehabilitation, the bird cleaning and rehabilitation responsibilities were transferred from SANCCOB to the islanders and a Plan of Action to the Tristan Administration was developed for the management of the operation. The last penguins were released by the islanders on 12th June.

MV SINGAPORE left Tristan da Cunha on 14th of April and headed to Brazil to fulfil a commercial job she was contracted for. MV IVAN PAPANIN left on 23rd April and arrived in Cape Town on the morning of 28th April.

Although no specific contingency plan existed on Tristan da Cunha regarding the response to an oil spill of this magnitude, it was possible to mobilise various responders and bird rehabilitators and their equipment and mount a response in a matter of days / weeks. Additionally, a large number of islanders could be quickly trained to carry out bird rehabilitation and shoreline clean-up tasks. However, a number of factors including first and foremost, the extreme remoteness of the spill location added significant difficulties to the operation. The constraints associated with chartering commercial vessels with a scheduled workload added tight timelines to implement the response. Finally, the timing of the spill could not have been worst for the adult penguins as it coincided with the end of their moulting cycle during which they stop feeding. Autopsies done during the rehabilitation operation revealed that the digestive systems of the birds were in a bad condition and that prolonged malnourishment during the three week moult period (pre-spill) and then the rigours of oiling meant that the birds were in very poor condition at the start of the cleaning and rehabilitation process. It was acknowledged by the mobilised veterinarian that a very large proportion of the oiled birds collected were probably non-viable despite surviving for several weeks after the bird response began. It is recognised, however, that the response has allowed the collection of a substantial body of information on Northern Rockhopper penguins that was previously not known.