

ARTICLES



DISASTER MANAGEMENT DURING A MASS STRANDING OF LOGGERHEAD POST-HATCHLINGS ALONG THE SOUTHERN COAST OF SOUTH AFRICA

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South Africa is home to two species of nesting sea turtles, the leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*) turtle. Nesting occurs along the northeastern coastline during early summer (October to December). After hatching, neonates are carried southward by the warm Agulhas Current. As this warm current slows and retroflects at the southern tip of Africa, it pushes eddies of warm water into the Atlantic Ocean and becomes more influenced by coastal winds. Young turtles at the mercy of the current are easily displaced by such winds, undergoing cold shock from the stark change in temperature (from 25°C to 12°C). With this cold shock, the onshore winds, and often injury, post-hatchling loggerhead turtles are routinely stranded along the southern coast of South Africa between March and June.

The Two Oceans Aquarium Foundation (TOAF), through its Turtle Conservation Centre (TCC), has been actively rehabilitating stranded sea turtles for the last 15 years. Situated at the southern tip of Africa, the TCC is strategically located to receive post-hatchling loggerhead turtles needing care. Over 1,300 sea turtles have been successfully rehabilitated and released through this programme.

In April 2024, unseasonably severe swell and onshore winds around the southern coast of South Africa resulted in the mass stranding of loggerhead post-hatchlings. Over just four days, more than 240 post-hatchlings were received at the TCC (Figure 1), making up a third of over 600 loggerhead post-hatchlings received during the 2024 stranding season (April to May). The unprecedented influx of turtles far exceeded the usual capacity of our rehabilitation facility, and therefore, crisis management was required. This article describes the actions taken in this crisis situation.



Figure 1. A group of post-hatchling loggerhead turtles rescued off the beach and transported in cardboard box with towel. (Photo credit: Two Oceans Aquarium Foundation)

AN ACTIVE TURTLE RESCUE NETWORK

The Turtle Rescue Network, from Lamberts Bay to Gqeberha, was managed telephonically via WhatsApp by one contact person. They would alert the entire community to stranding hotspots and weather predictions and advise action in real-time stranding situations. Coastal community members were actively searching for stranded turtles, and through the Turtle Rescue Network, these turtles were transported to the TCC. This network grew from 800 to 2000 individuals

over the season.

PHYSICAL CAPACITY

The TCC's existing capacity for 120 post-hatchlings required serious supplementation. With the assistance and support of the Two Oceans Aquarium workshop team, we were able to transform two operational areas of the Aquarium (the boat store and the roof of the *I&J Ocean Exhibit*) into housing for an additional 168 turtles (Figure 2). Ice-cream containers (20cm x 15cm and 8cm deep) in shared tanks were used to house weak individuals (Figure 3), increasing our capacity to almost 400 turtles.

Our national sea turtle rehabilitation partners, the South African Association of Marine Biological Research (SAAMBR) and BayWorld Oceanarium, supported the TCC by accepting turtles from our facility for continued rehabilitation and eventual release. Between April and



Figure 2. The boat house converted into a temporary turtle rehabilitation space, increasing capacity by 124 individuals. (Photo credit: Two Oceans Aquarium Foundation)



Figure 3. Post-hatchling loggerhead turtles being held at shallow water levels in ice-cream containers. (Photo credit: Two Oceans Aquarium Foundation)

October, SAAMBR accepted seven shipments from us, comprising 161 turtles for continued rehabilitation and 173 for release in total. BayWorld Oceanarium received one shipment of 40 turtles for continued rehabilitation. The pre-existing national communication structure for turtles was an incredible support and crucial to our ability to respond to this crisis.

HEALTH PARAMETERS

The initial arrivals of 2024 hatchlings were in good body condition and stronger than expected. As the stranding season progressed, the clinic started receiving weaker individuals who exhibited more typical stranding admission findings, such as predation wounds, emaciation, and signs of systemic disease.

Upon examination of physical and blood parameters, some interesting differences were found between the individuals of the 2024 stranding season and previous seasons. As part of our admission protocol, blood was collected for haematocrit and blood glucose readings from the subcarapacial sinus (0.05mL blood with a 0.3mL insulin syringe).

On average, this 2024 subset presented with higher haematocrit and blood glucose values than would have been expected based on previous stranding season data. Little published data exist with what is considered a normal haematocrit range in stranded loggerhead post-hatchlings. Most of the stranded individuals are classified as medically compromised, due to the presence of systemic disease or traumatic injuries. As a result, it is expected that admission blood parameters will differ from what is considered a normal range in healthy loggerhead hatchlings. Of the 333 hatchlings sampled (where a full data set was available), the number of turtles who presented with a haematocrit higher than 20.0% (range 5.0%-8.5%) was double that of the preceding years. Turtles with a haematocrit lower than 12.0% were injected with iron dextran (5mg/kg). Red blood cell values were monitored weekly, and iron dextran injections were repeated until they improved to a value higher than 15.0%.

In addition to the difference in haematocrit values, a shift in average admission blood glucose values were also observed. Most of the 2024 hatchlings presented with normo- or hyperglycaemia (range 0.7-12.6mmol/L), while data from previous years had more individuals identified with hypoglycaemia. It appeared as if hatchlings with higher haematocrits were also more likely to present with normo- or hyperglycaemia, although statistical analysis was not performed on the data.

We assume that many of the 2024 hatchlings were in a healthier and less compromised physical state when stranding occurred. We postulate that the unusually rough ocean conditions likely resulted in individuals washing up that would, under normal conditions, have been able to avoid stranding.

MEDICAL APPROACH

Due to the high volume of turtles received, intensive critical care for the weak and sick hatchlings proved challenging. Triage was key to managing all our patients. Turtles were triaged upon admission according to mental alertness, physical strength/weakness, respiratory capabilities, the presence of wounds, blood values (haematocrit and blood glucose), and body condition scores. Turtles were then colour-coded (red, yellow, or blue) and individually marked and housed accordingly. Triage data was also noted on intake data. The turtles would then, through veterinary discretion, be moved between triage levels depending on progress or deterioration.

Red: Critical care

These turtles were housed in the intensive care unit (ICU) or indoor quarantine areas. Upon admission, many of these individuals spent time in our ICU under near-constant watch until deemed stable enough to be placed in our quarantine unit. These patients were weighed daily and received relevant tube-feeding (Hill's a/d with fish oil) or hand-feeding (white mussel) multiple times per day. Based on energy and strength, these patients would receive supervised swims and shallow baths (2cm deep). Severely compromised individuals were housed in a veterinary incubator with heating, moisture, and supplemental oxygen. They also received intravenous or intracoelomic fluids (0.45% NaCl, with/without 2.5% glucose) and other relevant medications (antibiotics, pain relief, vitamin supplementation). Some individuals remained in such an ICU set-up for multiple days. Veterinary examination would occur twice weekly or as needed for weaker individuals in the ICU.

Yellow: Stable, on treatment

These turtles were housed in the indoor boat house,

allowing ease of access for veterinary treatments. Turtles were weighed weekly and had food dropped (gel food or protein) into their tank twice daily. If less than 50% of food was consumed during drop feeds, the turtles would also receive supplementary tube feeds (Hill's a/d with fish oil). Individuals were housed in deeper water (30-40cm) and received weekly veterinary examinations.

Blue: Stable, off treatment

These turtles were housed outdoors. These turtles were weighed weekly and received drop feeds (gel food or protein) twice daily. If less than 50% of food was consumed, they would also receive supplementary tube feed (Hill's a/d with fish oil). Individuals were in deeper water and received weekly veterinary examinations.

LEVERAGING A COMMUNITY

The power of sea turtles to inspire action and connect people was unmistakable during this time. Requests for volunteers and necessary items to house, feed, and treat turtles (ice-cream containers, consumables, equipment) were shared amongst our small existing volunteer group. The news spread quickly, and within days, we had received thousands of containers, months' worth of supplies, and hundreds of offers to volunteer. The Two Oceans Aquarium Foundation started a crowdfunding campaign to account for the many unplanned costs, and within just two months, 33,000 USD was raised.

LEARNINGS

With a changing climate and increased community awareness, the team at the Turtle Conservation Centre expect to see more extreme stranding events like these in the future. This crisis was a catalyst for improved medical triaging and forced us to systemise our rehabilitation processes to a greater extent. We will now be more prepared when similar situations arise in the future.

We are reminded of the power of sea turtles to unite, engage, and galvanise a community, and we are committed to further nurturing our swiftly growing community of turtle rescuers, supporters, and volunteers.