Enabling a Collaborative Marine Wildlife Stranding Network, Ocean Watch - Goa, One Year Report (June 2017 - June 2018)

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01 Background

Goa is situated on the southwest coast of India and has a coastline of approximately 105 km along the Arabian Sea, featuring beautiful bays, beaches, coral reefs and a diversity of riverine systems. Its coastal waters are home to the Indian Ocean Humpback Dolphin (*Sousa plumbea*) (Jefferson & Sutaria, 2004), the Indo-pacific Finless Porpoise (*Neophocaena phocaenoides*) (Jefferson & Sutaria, 2004), the Olive Ridley Turtle (*Lepidochelys olivacea*) (WWF-India, 2013), along with some reports of the Green turtle (*Chelonia mydas*) (Giri & Chaturvedi, 2003) and the Hawksbill turtle (*Eretmochelys imbricata*) - all of which are on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species. All these species are also given the highest level of legal protection under Schedule-I of the Wildlife Protection Act (1972) of the Government of India. In addition to these species, the coast has also witnessed occasional stranding incidents of whales such as the Dwarf Sperm Whale (*Kogia sima*) and other dolphin species such as the Striped dolphin (*Stenella coeruleoalba*). Yet, there is little awareness about the presence of these endangered species along the coastal waters of Goa.

The tourism industry and consequent development along the coastal belt of Goa is rapidly expanding. Boat traffic, through tourist trips and water sports, is on the rise to accommodate an ever-increasing influx of tourists into the State. 2017 saw over 7.5 million tourists visiting Goa, as compared to just over 4 million tourists in 2014 (Department of Tourism - Govt of Goa, 2018). This growing number of tourists and the consequent growth in the marine tourism industry including the presence of high speed boats used for water sports has been shown to have a negative impact on the state's marine biodiversity (Sanjeev et al., 2016). The state's fragile marine ecosystems are likely further stressed by the state's challenges in regulating mechanized fisheries which has resulted in an increasing number of fishing boats and trawlers as well as the consequent increase in drifting nets. Other likely stressors for the marine environment include marine debris and the presence of naval and Coast Guard ships. However, further studies are required to establish the extent and impact of such activities on the marine ecosystem.

Globally, stranding of marine species such as turtles and cetaceans (i.e whales, dolphins and porpoises) is a common phenomenon. Countries such as the USA have sophisticated stranding response networks to manage and to collect data from such stranding incidents across their coastlines. Examples of such networks include the National Marine Fisheries Service Marine Mammal Health & Stranding Response Programme and the US Fish and Wildlife Service. In other countries as well, there are numerous stranding networks (visit http://www.marinemammalcenter.org/science/crc-marine-stranding-network/ for information on marine stranding networks across the world). By comparison the number of functional stranding networks along the Indian coastline are very few.

Stranding incidents of marine species along the Indian coast are not a recent phenomenon. Such incidents have been documented since early 1800 and do not seem to have been a regular occurrence (Kumaran, 2002). However, with increasing social awareness and interest in marine science, there has been an increase in reporting of such incidents in the media. Given the challenges in establishing and running networks that report and respond to stranding incidents, there has been a lack of systematic data collection and therefore no clear reasoning for the perceived increase in their frequency, as can be seen from summary reports of stranding incidents along the Indian coastline. Kumaran (2002) compiled the available reports on the stranding of Indian marine mammals, from over 180 published papers and reports between the years 1800 to 2000 and reported 1452 records all along India's vast coastline including its two island groups. This publication helped in understanding the diversity of marine mammals along India's coast (amongst the richest in the Indian Ocean) and indicated that most of the stranding pertains to occasional and/or accidental entanglements in fishing gear, especially gillnets. Since then, there have been numerous efforts along India's coastline to systematically document stranding incidents and to build capacity of people who are often associated with stranding, to improve responses to these incidents. Local stranding networks have been set up in different places and are known from the coastal states of Tamil Nadu, Karnataka, Goa, Maharashtra, Gujarat and the Islands of Andaman and Nicobar. However, it is important to note that many of these networks are

severely limited in their geographic scope and often limited to very specific beach stretches. The Central Marine Fisheries Research Institute maintains a record of stranding incidents that have been reported in the media i.e anecdotal and secondary information. Another centralized database for India is the Marine Mammal Conservation Network of India. on stranding incidents and sightings. The majority of these networks have seen erratic reporting due to the absence of a structured network of first-responders who continuously monitor the coastline. Goa also has witnessed erratic and sparse reporting of marine species stranding in the Marine Mammal Conservation Network of India's database with only 14 reports scattered over a period of 82 years (1935 – 2017).

The lack of capacity, training and awareness in dealing with stranding in Goa and in other states was highlighted in 2016, when a Dwarf Sperm Whale (*Kogia sima*) washed up alive on a beach in South Goa (Times of India, 2016[1]). In the absence of an established and trained stranding response and monitoring network in the state, responders found it difficult to provide timely and appropriate assistance to the stranded Dwarf Sperm Whale. Additionally, coordination and management of tourist safety and crowd control proved to be difficult without a structured system in place, which impeded the on-ground response in this incident.

Typically, the stranding of a marine species occurs when it is dead (carcass washes up along the beaches and coasts); or when it is alive and is unable to return to its natural habitat due to its condition and/or weakness. There are a number of reasons why marine species strand. In most cases, the cause of stranding is unknown but some of the known and identified causes include: diseases due to parasite infection (Stroud & Roffe, 1979) (Gulland FMD et al., 1997) (Kreuder et al., 2003), harmful algal blooms (Truchon et al., 2013) (Gulland, 2000), injuries due to ship strikes or human interaction (Bogomolni et al., 2010), fishing net entanglements (NOAA, 2014) (Alava et al, 2005), pollution exposure, and malnutrition. Some stranding incidents may be

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[1] https://timesofindia.indiatimes.com/city/goa/Whale-stranded-at-Palolem-dies/articleshow/51756474.cms (accessed September 30th, 2018)

related to unusual weather or oceanographic events (Greig et al., 2005). As large marine mammals and sea turtles are important indicator species of our ocean health it has been argued that documenting stranding incidents and learnings from each case significantly contributes to our understanding of the species, provides support in raising public education and awareness and most importantly, gives us a good understanding of the health of our oceans.

A glimpse of the capacity building workshops held in June 2017 that led to the establishment of the Marine Wildlife Stranding Network – Ocean Watch, Goa: Drishti lifeguards practicing live cetacean stranding protocols.

In response to emerging needs and to better inform conservation strategies for marine species in Goa; Terra Conscious in collaboration with IUCN India (under their Mangroves for the Future regional initiative), Drishti Marine and Goa Forest Department initiated a set of capacity building workshops for lifeguards and forest guards in June 2017. These workshops provided training on globally accepted marine stranding response protocols (**for details refer to Annexe 1**). This led to the establishment of a Marine Wildlife Stranding Network, Ocean Watch - Goa, a

pioneering public-private collaborative, structured network which provides comprehensive and continuous monitoring of the coast of Goa.

The network is structured as follows:

First Line Responders – Field Reporting Network

Drishti Marine is a private company that has been awarded the contract by the Department of Tourism, Government of Goa, to deploy and manage approximately 600 lifeguards who are distributed across 44 beach stretches along North and South Goa. Their primary responsibility is towards ensuring the safety and lives of tourists. Drishti Marine has also been awarded the contract for providing beach cleaning services in addition to life-saving across all the 44 beach stretches (lifeguard towers are present on 35 beaches). At each of these beaches, approximately 10-23 lifeguards are deployed during the day time (i.e from 07:30 hrs to 20:00 hrs) in rotating shifts. Drishti Marine also employs beach safety patrol staff who patrol the same beaches at night (i.e from 18:30 hrs to 07:30 hrs).

Drishti lifeguards and forest guards responding to the stranding of a turtle carcass at Anjuna beach in February 2018: Lifeguards loading the turtle carcass onto a Goa Forest Department vehicle.

Thus, due to the nature of lifeguarding protocols, and the spatial and temporal coverage along all of Goa's coastline, Drishti Marine is the ideal stakeholder to provide first line responders for marine wildlife stranding.

Designated Authority to Manage Stranding Incidents

As per the Wildlife Protection Act, 1972, the State Forest Department is the designated respondent for all Schedule-I species. Their mandated role includes responding to a report of a stranded Schedule-I species, assessing the situation on ground, bringing in the required expertise (such as veterinarians from the Animal Husbandry department) and ultimately, making the final decision about how the stranded animal is to be handled. Furthermore, since the Forest Department is the custodian of all wildlife in the State, it is also in their mandate to provide rescue services and bring together multiple stakeholders to develop conservation strategies for key species. In this network, Range Forest Officers and Forest Guards from the Animal Rescue Squad are in-charge of providing on ground response, whereas Deputy Conservators of Forest for each division provide the management decisions in dealing with stranding incidents.

Stranding Network Coordinators

IUCN India and Terra Conscious perform the role of coordinators for the network. IUCN provides technical expertise, and Terra Conscious due to its established stakeholder network in the state, provides the on ground coordination needed for each stranding incident. They also work collaboratively to maintain a database of the reported stranding incidents and facilitate the continuous capacity building of the network.

Since the inception of the programme in June 2017, the network has provided efficient and continuous reports and response to stranding incidents occurring along the coast. The trained responders were found to be following stranding protocols, resulting in a compiled database of 115 stranding incidents reported from Goa's 105 km coastline.

The network also proved to be beneficial in other ways:

1) The stranding reports have led to the creation of a database that documents the occurrence of marine species along Goa's coastline.

2) The stranding database provides valuable biological information about the species and their health.

3) The formation of this network has also increased public awareness about marine species and stranding incidents in Goa. In the long term, such awareness can reduce the chances of negative human interactions with the species.

Drishti lifeguards, Forest Department officials and Terra Conscious team responding to the stranding of a turtle carcass at Anjuna beach: A truly collaborative effort.

The method of reporting that was followed by the network for these stranding incidents and the data thus generated is presented in subsequent sections.
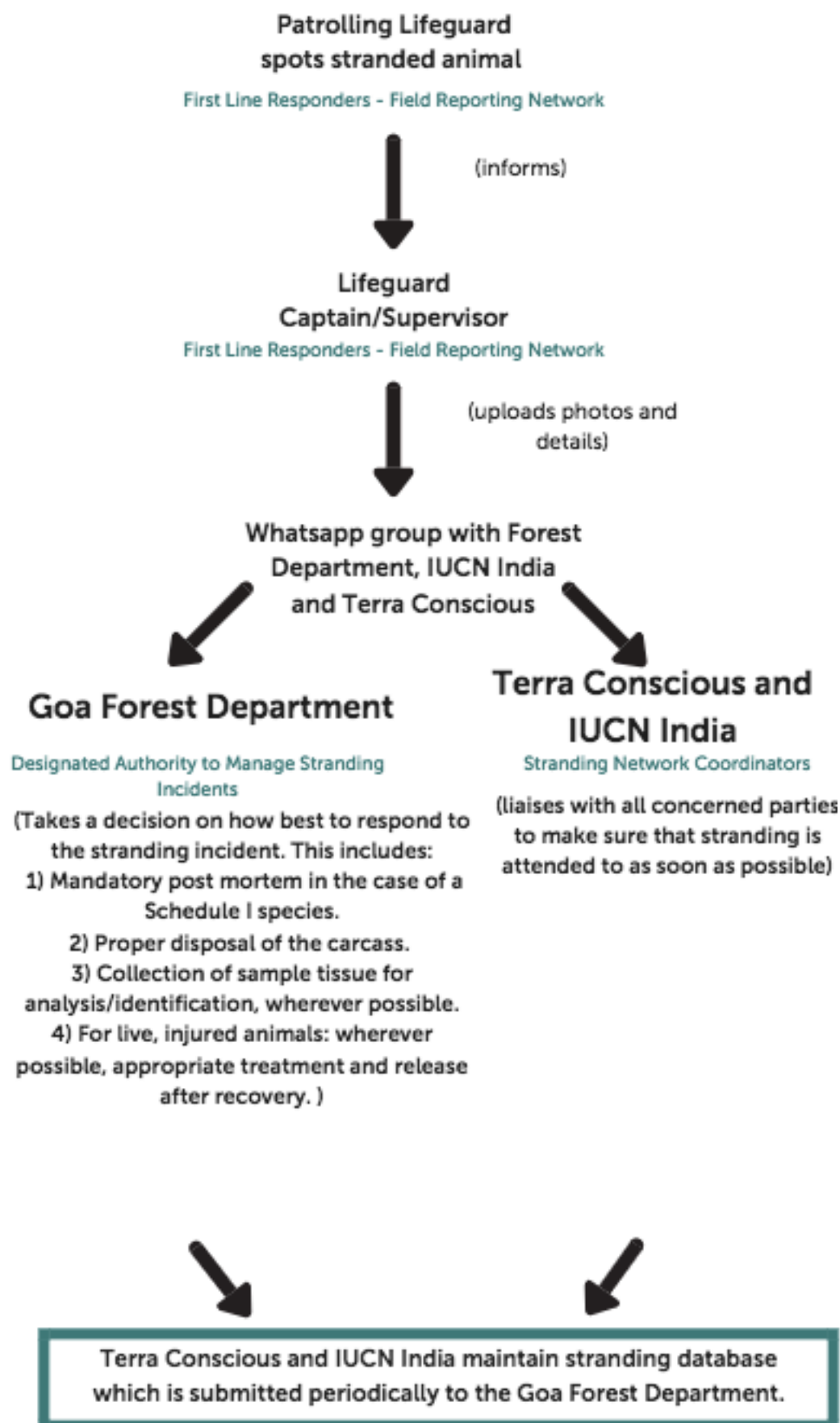
Methodology: Response to Stranding Incidents

The Marine Wildlife Stranding Network, Ocean Watch - Goa is a voluntary network comprising of individuals, experts, trained lifeguards and staff of the Goa Forest Department. This network is coordinated by Terra Conscious (a local conservation social enterprise) & IUCN India and each stranding incident is handled on a case-by-case basis. As mentioned earlier, the response to each case depends on three levels of responders i.e the first response network of trained lifeguards, the second response network of trained forest officials and the third being the coordinating agencies (Terra Conscious & IUCN India) that manage the network.

It is the role of the first response network of lifeguards to report any stranding incidents that they encounter whilst patrolling the coast. These incidents are reported to the second response network and the network co-ordinators.

As mentioned earlier, the State Forest Department is the designated authority to manage stranding incidents. It is thus within the Forest Department's mandate to take the final decision on how each stranded animal or carcass is to be handled. In the case of carcasses of Schedule-I species, the Goa Forest Department ensures that a mandatory post-mortem is conducted with the help of a veterinarian from the area/ from the Animal Husbandry department. The Forest Department also ensures disposal of each carcass after the required tissue samples are collected for analysis or identification. In the case of live, injured animals, the required treatment is provided wherever possible and the animal is released after recovery. The Forest Department maintains a database of all injured turtles that are brought in for treatment and released after recovery.

Terra Conscious and IUCN India, in their role as co-ordinators of the network, provide support, encouragement and advice to both the first and second responders' networks to ensure appropriate response for each stranding incident. Terra Conscious and IUCN India also maintain a stranding database that is submitted periodically to the Goa Forest Department.

The sequence of events constituting the response to each stranding incident over the past year has been illustrated in **Figure 1**:

Patrolling Lifeguard spots stranded animal
First Line Responders - Field Reporting Network

↓ (informs)

Lifeguard Captain/Supervisor
First Line Responders - Field Reporting Network

↓ (uploads photos and details)

Whatsapp group with Forest Department, IUCN India and Terra Conscious

Goa Forest Department
Designated Authority to Manage Stranding Incidents
(Takes a decision on how best to respond to the stranding incident. This includes:
1) Mandatory post mortem in the case of a Schedule I species.
2) Proper disposal of the carcass.
3) Collection of sample tissue for analysis/identification, wherever possible.
4) For live, injured animals: wherever possible, appropriate treatment and release after recovery.)

Terra Conscious and IUCN India
Stranding Network Coordinators
(liaises with all concerned parties to make sure that stranding is attended to as soon as possible)

Terra Conscious and IUCN India maintain stranding database which is submitted periodically to the Goa Forest Department.

03 Summary of Data from Stranding Incidents –
June 28, 2017 to June 29, 2018

This network focused on monitoring reports of stranded cetaceans and sea turtles. A total of 115 stranding incidents were reported over a year long period (June 2017 – June 2018) of which 94 were carcass stranding incidents and 21 were live stranding incidents – **Table 1**.

Table-1: Summary of all reported stranding incidents between June 28, 2017 – June 29, 2018.

Type of stranding	Total numbers
Carcass stranding	94
Live stranding	21
TOTAL STRANDING INCIDENTS	**115**

Among cetaceans, a total of 37 incidents were reported and these accounted for approximately 32% of all reported stranding incidents. No live stranding incidents of cetaceans were reported during this period – all reported cetaceans were carcasses. The Indian Ocean Humpback Dolphin was the most common of these, accounting for 64.8% of all Cetaceans recorded followed by the Indo-pacific Finless Porpoise – accounting for 24.3% of all Cetaceans. – **Table 2**.

Table-2: Species break-up of cetacean stranding incidents reported between June 28, 2017 – June 29, 2018.

| Species	Total numbers
Indian Ocean Humpback Dolphin	24
Indo-pacific Finless Porpoise	9
Unidentified Baleen Whale	2
Unidentified Cetacean	2
TOTAL CETACEAN STRANDING INCIDENTS	**37**

Sea turtles were recorded throughout the year and made up over 67% (78 incidents) of all reported stranding incidents **(Table – 3).** Of these, 21 were live stranding incidents and 57 were carcass strandings. Among live stranding incidents a significant majority – 80% (n=17) was reported from the coast of South Goa with only 4 live turtles reported from the coast of North Goa. All known sea turtles from Goa were recorded and the Olive Ridley turtle was the most commonly reported and accounted for 47 (27 carcasses and 20 alive) incidents out of the sea turtle stranding incidents – **Table 3**.

Table-3: Species break-up of sea turtle stranding incidents reported between 28 June 2017 to June 29, 2018

Species	Total numbers
LIVE STRANDING INCIDENTS	
Olive Ridley Turtle	20
Green Sea Turtle	1
CARCASS STRANDING INCIDENTS	
Olive Ridley turtle	27
Green Sea turtle	10
Hawksbill turtle	2
Unidentified Sea Turtle	18
TOTAL SEA TURTLE STRANDING INCIDENTS (LIVE & CARCASS)	**78**

In total, positive species identification could not be made for only 4 incidents of cetacean strandings and for 18 incidents of sea turtle strandings. This was because a majority of these unknowns (77%), were code 4 or 5 carcass (advance stages of decomposition or skeletal remains). This makes positive species identification difficult based on visual examinations alone.

A spatial representation of turtle and cetacean stranding incidents reported by the network is provided in **Figure 2** below.
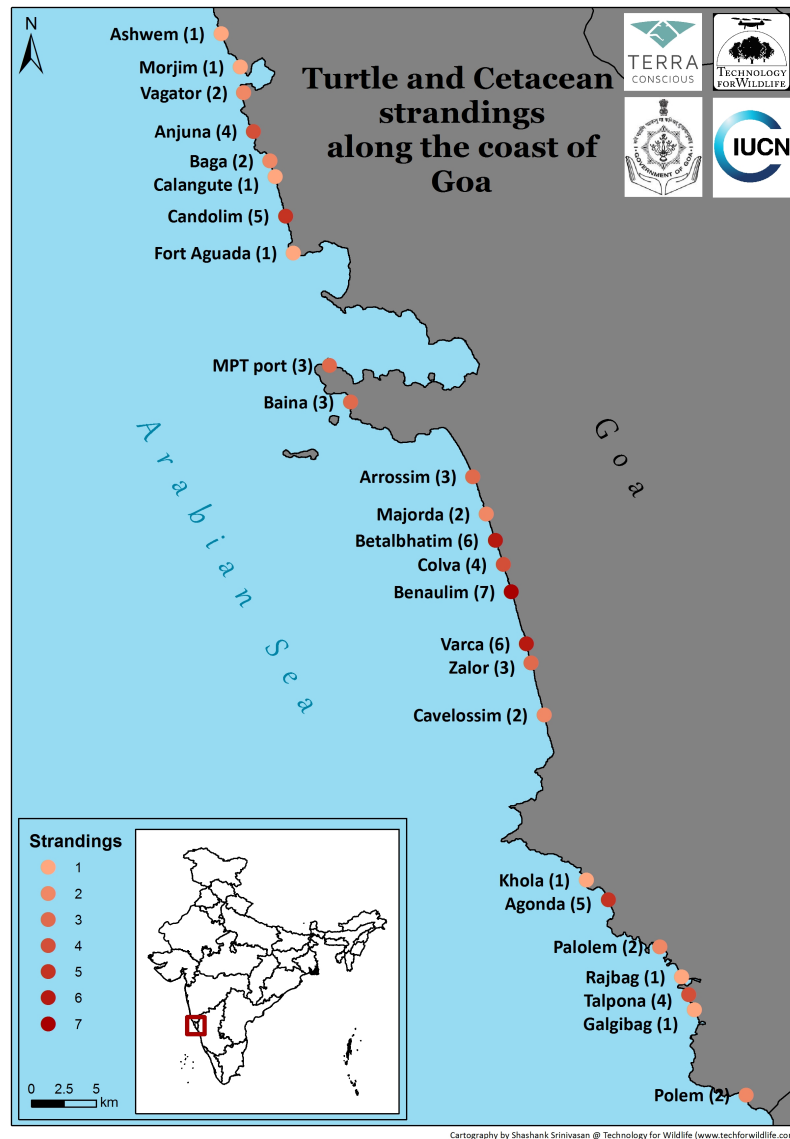
Figure 2: Spatial representation of reported marine stranding incidents (turtles and cetaceans) across Goa's coastline.

As depicted in **Figure 2**, stranding incidents were reported across both the North Goa and South Goa coast. The coast of South Goa had greater incidents of total strandings (both cetaceans and sea turtles) when compared to the coast of North Goa **(Figure 3 & 4).**

The location-wise break up of cetacean and sea turtle stranding incidents is depicted using bar-graphs **(Figure 3 & 4)** below. In the graphs, beaches with '(T)' after their names are those where a lifeguard tower is present, those with '(2T)' have two lifeguard towers and those with '(NT)' have no tower, but still have lifeguard presence.
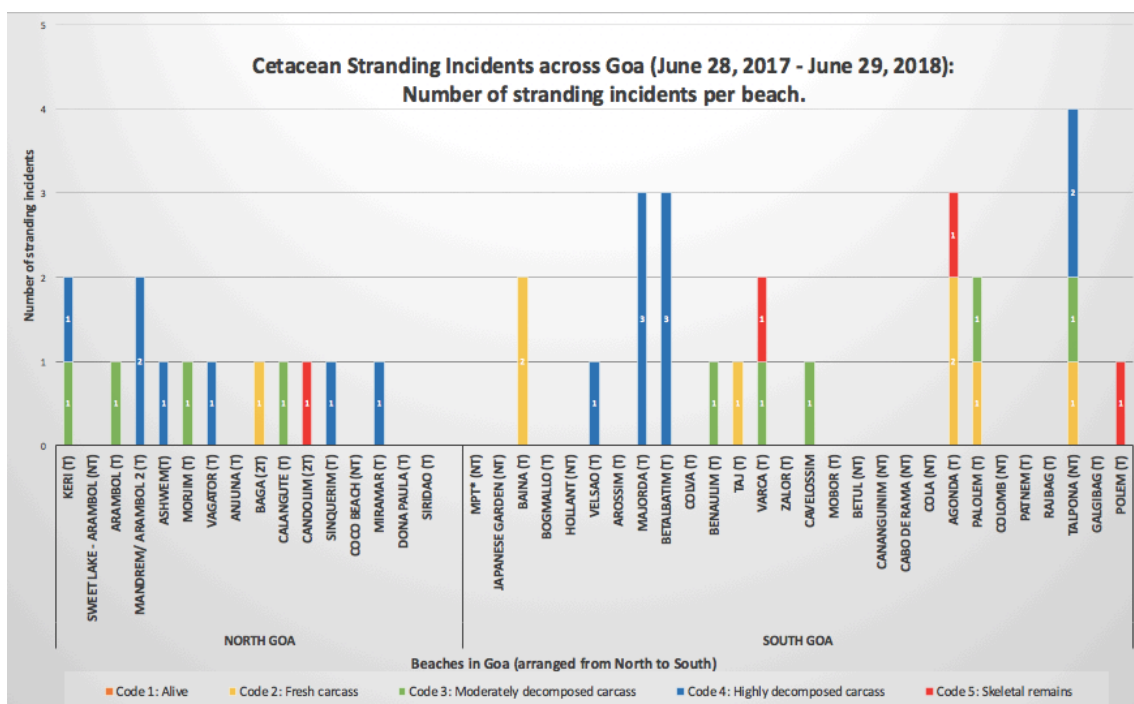
Figure 3: Bar graph depicting cetacean stranding incidents (June 28, 2017 – June 29, 2018).

Among cetaceans, for South Goa, Talpona beach reported the highest number of incidents of stranding (4 for the year), followed by Betalbatim, Majorda and Agonda (3 each). In North Goa, Keri and Mandrem beaches recorded 2 strandings each while the rest had only single stranding incidents **(Fig 3).**

Among sea turtles, the stranding patterns were quite different when compared to cetaceans, with Betalbatim and Benaulim beaches reporting 7 stranding incidents each and no reports from Talpona, while Anjuna beach in North Goa reported the highest number (5) of sea turtle stranding. **(Fig 4).**
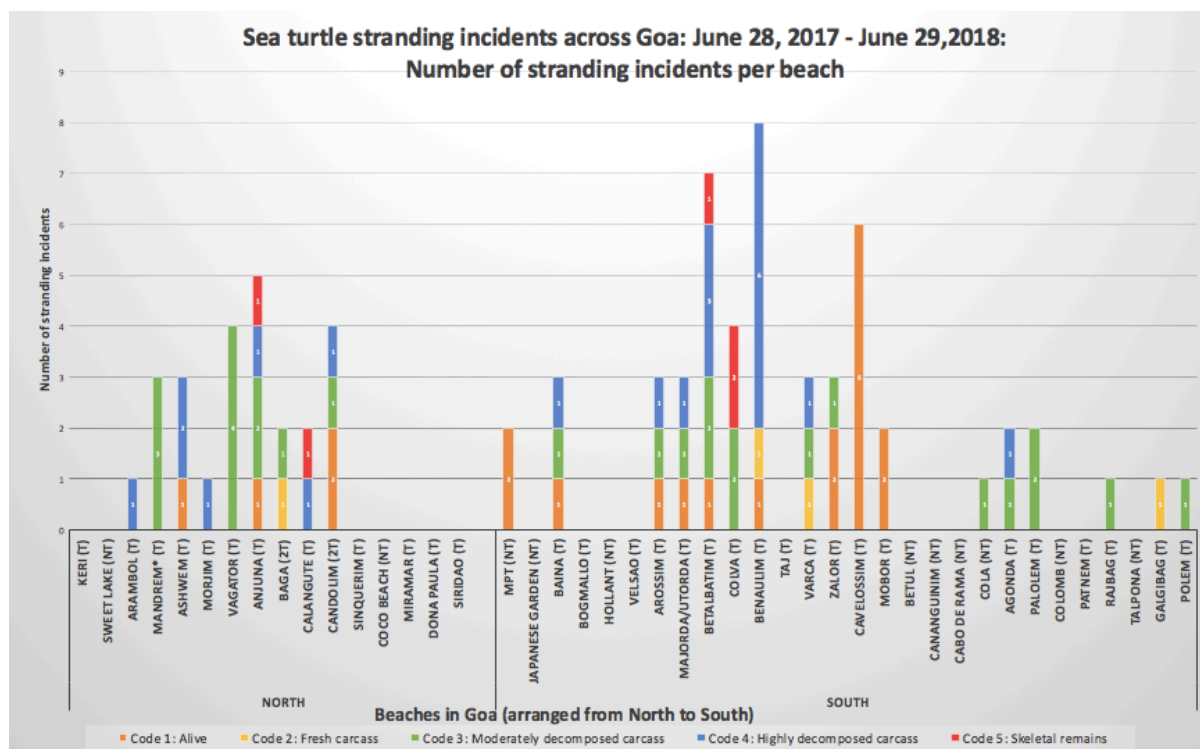
Figure 4: Bar graph depicting sea turtle stranding incidents (June 28, 2017 – June 29, 2018).
* There is no lifeguard presence at MPT (Mormugao Port) since there is no beach here, however a stranding incident was reported to the network from here by a citizen.

Plate 1 and 2 (attached as annexes) provide a photographic record of these stranding incidents. It is important to note that the patterns inferred above are only from a single year of data collection from the network. This initiative will continue in Goa to monitor, analyze data, provide capacity building, support better diagnostics provided by veterinarians and with this create a critical ongoing dataset needed to guide and advise management strategies to address marine species strandings.

Aside from stranding reports of cetaceans and turtles, the network has also led to the reporting of one stranding incident of a terrestrial species i.e the flapshell turtle (*Lissemys punctata*).

04 Key Learnings & Recommendations

4.1 Key Learnings

During the first year of operating this network, several key learnings were identified as discussed below:

- The need for scientifically appropriate training of the first information network and designated authorities on stranding protocols is critical and determines the efficiency of the response. While launching the network in 2017, the project trained 142 Drishti personnel i.e only 25% of their staff and 43 forest guards. The network gained experience and response efficiency within a few months and it was heartening to see the under equipped lifeguards and forest staff following protocols while handling carcasses. During the next year of the stranding network, efforts were taken to train all available Drishti staff (i.e approximately 550 personnel) and 43 forest guards. Efforts were also undertaken to provide basic equipment to aid in the response protocol, ensure safety of first responders and also lead to more scientific data collection from stranding incidents.

- There is a lack of basic equipment required to adequately respond to stranding incidents. Currently, face masks and stretchers (for carrying turtles and dolphins) have not been provided at all lifeguard towers. Further, the Forest Department needs improved infrastructure for appropriate treatment and recovery of live, injured animals in accordance with globally established basic guidelines (Bluvias & Eckert, 2010). This includes temporary facilities that have adequate holding tanks (including treatment and convalescence tanks), filtration systems, access to running sea water as well as access to appropriate medical equipment and a surgical room for treatment. In the absence of these facilities, the network has had to adapt to the available resources such as the use of towels in the place of stretchers for live stranded animals and a small recovery tank for turtles lined with a plastic sheet. While these adaptations suit short term needs, it is vital that they are addressed to ensure better stranding response in the long-term.

- The need for an overall coordinating agency is vital to ensure continuous and systematic reporting and response. Having such an agency in other stranding networks that are being planned would ensure that all stakeholders are supported and this in turn, will boost their morale to respond to and report stranding incidents in the future. The coordination agencies, as neutral bodies, are also important in supporting communications between the different players in the network and ensuring that any challenges/conflicts that may emerge in daily operations are addressed to continue meeting the objectives of the network.

4.2 Key Recommendations

With the establishment of this network, a beginning has been made to bring about systematic reporting and response to cases of marine wildlife stranding. However, based on the learnings highlighted above, it is clear that the network needs to be further strengthened in order to improve the efficiency of reporting and to provide better response to each stranding incident. Data collected from stranding incidents must be maintained on an on-going basis, towards building a robust database of stranding incidents that can inform research conducted by experts to identify drivers of stranding. This will further strengthen collaborative marine conservation strategies and action on the ground. Of equal importance is the need for greater capacity in conducting necropsies to determine the cause of death and collect samples (where appropriate) that can help further our knowledge of these marine species, their health issues and in turn help to gain insight into the overall health of our coastal waters.

Based on the learnings highlighted above, our interactions with a range of stakeholders as well as learnings from other globally operational stranding networks, the following are recommended to further strengthen the network in the future:

Capacity building

- Periodic refresher training workshops need to be conducted on stranding protocols for all lifeguards and Forest Department personnel. These workshops must be conducted at least on an annual basis to provide responders with updated skills and response protocols.

- Training sessions need to be conducted for veterinarians, to continue to build their skills in conducting necropsies and in the treatment of sea turtles and cetaceans. This is because veterinarians in Goa currently lack the technical expertise required to address cetacean and turtle stranding incidents.

- A practical necropsy training session must be conducted with the use of a real carcass, to enable veterinarians to conduct necropsy procedures independently, and ensure that they are able to collect and analyse samples with approvals from Goa FD. In July of 2018, a training programme which covered techniques for necropsy was indeed facilitated by Terra Conscious and IUCN India for 12 veterinarians but this did not include practical demonstrations. While all veterinarians appreciated the training and the knowledge gained, they also requested future sessions that would cover the aforementioned aspects. Such training and capacity building will help to establish the cause of death, provide other important species level information and help to better understand the reasons for stranding incidents.

- An organised network of local veterinarians who are trained in conducting treatment and necropsies needs to be created and roster arrangements need to be made for the coastal stretches across the State. Such arrangements would ensure that there is always a veterinarian available on-call to attend to a stranding incident.

Equipment and Facilities

- Basic rescue kits must be distributed at all lifeguard towers. The rescue kits should include protective/reusable gloves, face masks, measuring tapes, animal stretchers and a field manual with stranding protocols for reference. The rescue field manuals must be compiled, outlining a user-friendly, step-by-step stranding rescue procedure.

- Due to the high frequency of live turtle stranding incidents being reported in Goa, a dedicated turtle treatment and transit centre at the Forest Department is required, equipped with specialised tanks, filtration units and a surgical room. The facility must be adapted to the local conditions.

Awareness building

- An awareness building campaign must be carried out in the State to sensitize the general public on marine stranding incidents. This must include sensitization of shack owners in the form of workshops and sensitization of tourists in the form of information boards placed strategically along the coast, detailing the steps to take in case a stranded animal is sighted.

Policy recommendations

- There is a need for a national level framework to assess the risks, benefits, costs, and probabilities that branch out from various choices to euthanize, rehabilitate, and release stranded animals.

- There is a need to develop a set of adaptive guidelines/frameworks that can be incorporated into a standard operating procedures (SOPs) that can be used to guide the creation of similar marine stranding networks in other coastal states in India that are suited to the local realities of each state.

05 Way forward

Terra Conscious, IUCN-India and the Goa Forest Department are committed to ensuring that the Marine Wildlife Stranding Network, Ocean Watch – Goa continues monitoring the coast of Goa and provides efficient, timely and scientifically appropriate response to stranding incidents in the future. In order for this to happen, efforts will be undertaken in the future to conduct refresher training sessions for first responders, continued capacity building for veterinarians, provision of required equipment to assist in first response and creation of better facilities for turtle treatment and recovery. The development of sustainable economic models could also be explored to keep the network running in the long term. Additionally, since stranding incidents are indicative of larger marine conservation challenges, further studies could also be conducted to enable evidence-based systematic interventions to reduce the causes of stranding in Goa.

Alongside this, Terra Conscious and IUCN India are also invested in ensuring that the learnings from this network are used to develop adaptive frameworks/guidelines that can be incorporated into an SOP for establishing and running such networks in other coastal states in India. This can be coupled with enabling policy change that mandates the setting up of such networks in all coastal states across India with the help of the aforementioned guidelines.

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Annexe – 1: Marine Stranding Protocols & Carcass Codes

(Adapted from Global Marine Animal Stranding Training Toolkit[2])

A1.1 Live Animal Stranding Protocol

* Contact the local Forest Department immediately and request for official presence at the sight and for a veterinarian to be sent out.

* Cordon off the area and ensure that onlookers remain at a distance of at least 25m away from the animal. Minimize all human contact with the animal.

* Rescue team must wear protective gear, such as gloves and a facemask to prevent risk of disease or infection.

* Construct a temporary shield over the animal to cover it from the sun and heat – large beach umbrellas could be used for this purpose.

* Cover the body of the animal with a cloth or towel and pour water over the material to keep it wet at all times. Cover the eyes and head with a smaller wet cloth to limit stress. Make sure that the animal is in a comfortable position, and is not upside down or resting on a flipper. If the animal is on sand, dig some space around the flippers to prevent injury, should the animal struggle or try to move.

* If the animal is not fit to be released immediately, the Forest Department must transport it to a treatment/recovery facility for necessary treatment and care.

<u>For dolphins or other cetaceans:</u>

* Ensure that the blowhole is not covered by water, sand, or any other obstructions.

* Avoid getting close to the tail fluke or the snout area to avoid injury.

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[2] gmast.org (accessed September 30th, 2018)

* Create a sling out of any suitable non-abrasive material. To get the sling in place, one helper should gently roll the body to one side while a second helper gradually slides the sling underneath, one small section at a time.

* Once the sling is in place, move the cetacean towards the water, hoisting it up gently by the sling. It must be held by helpers on both sides to ensure maximum support.

* Once in the water, release the sling only when the cetacean can keep itself upright and can swim. This must be done under the supervision of an authorised veterinarian as well as in the presence of Forest Department personnel.

For turtles:

* Avoid getting close to the beak and mouth area, to avoid injury.

* To place the turtle on the sling, lift it gently by its carapace, one hand towards the front and one towards the back. Lift the turtle as little as possible away from the ground, keeping its body level and parallel to the ground.

* Once the turtle is positioned on the sling, ensure that all flippers are kept in a natural position, slightly tucked in and enclosed in the sling before hoisting it up.

*Under the supervision of an authorised veterinarian, move the turtle towards the water using the method detailed above.

A1.2 Carcass stranding protocol

* Cordon off the area and maintain a distance of at least 25m between crowds and the carcass. Keep scavengers away from the carcass and wear gloves and a mask at all times, to prevent infection. Thoroughly wash and disinfect hands and any other exposed body parts after handling is over.

* Contact the local Forest Department immediately and request for official presence at the sight and for a veterinarian to be sent out.

* Assess the condition of the carcass and identify the carcass code using the identification codes 1 to 5 (see below).

* Take pictures from the correct angles, clearly showing any injuries or lesions.

* If possible, measure the total length and breadth of the carcass.

Carcass Identification Codes

*Code 1: Alive – even if the animal dies within a few hours of stranding it must still be identified as code 1.

*Code 2: Fresh carcass – no odour, no discolouration, skin mostly intact, and eyes appear clear and fresh.

*Code 3: Moderate decomposition – slight odour, some discolouration, eyes start protruding, carcass starts bloating. Scavenger damage may be visible.

*Code 4: Advanced decomposition – strong and foul odour, advanced discolouration, skin peeling off, eyes protruding or missing, extensive bloating or rupturing of carcass, internal organs exposed and liquefying, scavenger damage.

*Code 5: Skeletal or mummified remains, only bones and some tissue remaining. Therefore, it may be hard to identify the animal or species.

PLATE 1: Photographic Records of Cetacean Stranding Incidents

PLATE 2: Photographic Records of Turtle Stranding Incidents