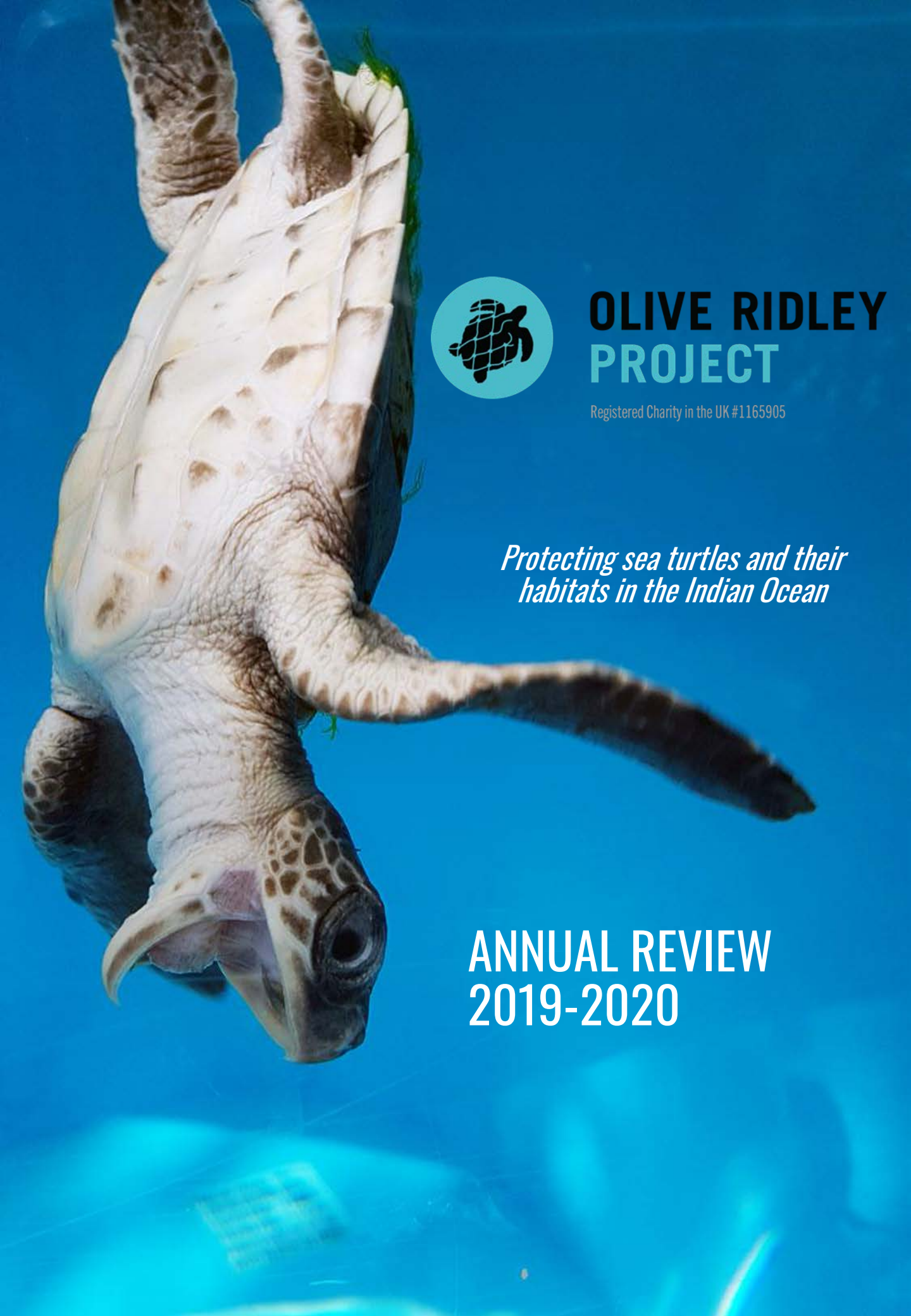

OLIVE RIDLEY PROJECT

Registered Charity in the UK #1165905

Protecting sea turtles and their habitats in the Indian Ocean

ANNUAL REVIEW 2019-2020

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ABOUT THE OLIVE RIDLEY PROJECT

The Olive Ridley Project (ORP) is a UK registered charity established in 2013. Our vision is to protect sea turtles and their habitats in the Indian Ocean.

The ORP operates in several regions of the Indian Ocean including the Maldives, Kenya, Oman and Pakistan. We focus on research, rehabilitation, education and outreach to achieve our vision. We operate a Marine Turtle Rescue Centre and a Sea Turtle Rehabilitation Centre in the Maldives.

We are a team of turtle biologists, veterinarians and conservationists that use our knowledge to safeguard sea turtles and their habitats.

OUR RESEARCH

We have one of the largest sea turtle-ID and ghost net databases in the Indian Ocean.

Our research areas are:

- Photo-identification (population research).
- Genetics / isotopes
- Ocean modelling
- Ghost gear modelling.
- Parasitology
- Turtle behaviour
- Satellite tagging
- Sea turtle veterinarian science

OUR PARTNERS

We have partnered with resorts, organisations and local NGOs around the Indian Ocean to host our rescue and rehabilitation centres, research teams, and to maximise the effectiveness of our reach in local communities. We would like to extend our gratitude for their backing, help, and support.

COCO COLLECTION

KureduResort MALDIVES

SIX SENSES ZIGHY BAY

SIX SENSES LAAMU

One&Only REETHI RAH Maldives

prodivers maldives

MUI MALDIVES UNDERWATER INITIATIVE

THE Sands AT NOMAD

marine EDUCATION CENTRE

Conservation Education Society

IDEAS Development & Environmental Awareness

indus SCUBA Education | Exploration | Conservation

UNIVERSITY OF DERBY

OLIVE RIDLEY PROJECT

Registered Charity in the UK #1165905

GR462, Holiday, Lhaviyani Atoll

EXECUTIVE SUMMARY

The fiscal period April 2019 - March 2020 was a very successful year for the Olive Ridley Project (ORP) in all aspects - until the COVID-19 outbreak in March 2020. It was our best ever year financially; our internship and volunteer programmes ran at full capacity; our research projects made huge advances and several important research papers were published; our turtle rehabilitation facilities expanded; and our circular economy pilot project in Abdul Rehman Goth in Karachi, Pakistan, progressed in new ways. We also expanded our research team with a turtle monitoring assistant in Kenya and a sea turtle biologist in Baa Atoll, Maldives.

We recorded a total of 644 new individuals in the Maldives (176 green turtles, 468 hawksbill turtles), 257 new individuals in Kenya (229 green, 28 hawksbill), and 24 in Oman. (19 green, 5 hawksbill) New sightings increased by 23% in the Maldives compared to last year and this is due, in part, to our successful research expeditions to Haa Alif Atoll in the north of Maldives. We also continue to record turtle nesting in the Maldives. During the year we monitored a total of 94 nests: 1 olive ridley, 2 hawksbill and 91 green turtle.

This year we reported 142 stranded sea turtles in the Maldives, of which 90% were olive ridleys. The major reasons for stranding were either entanglement in ghost nets or cement bags, or turtles were found floating on the surface with buoyancy syndrome. We transported 63% of the stranded turtles to rescue centres for treatment. With the opening of our second Sea Turtle Rehabilitation Centre at One & Only Reethi Rah in North Malé Atoll we provided care and treatment for 45 turtles and, to date, successfully released 20 of these turtles back into the wild.

We continue to work with the fishing community of Abdul Rehman Goth. Our aim is to continue our circular economy project using ghost gear as a raw material. We hope to expand this model to other regions of Pakistan and, possibly, beyond. Income from ghost net products made by the fishing community helps generate an alternative income whilst removing this form of pollution from the local environment. In parallel, we have firmly cemented the threat of ghost gear within the community and some fishers are now giving end-of-life fishing gear to ORP for recycling.

This year, ORP reached out to a number of new local partners in an effort to expand our impact to protect sea turtles and their habitats in the Indian Ocean. We have many new research collaborations in the pipeline as well as turtle rehabilitation facilities. We also formed several new commercial partnerships in an effort to diversify our fundraising income.

Unfortunately, the COVID-19 Pandemic has resulted in travel restrictions and temporary suspension on research and educational outreach in the areas we work. We are hopeful that we will be able to recover from these temporary closures and restrictions and expand our research, education, and outreach further in 2021.

- Dr. Martin Stelfox, ORP CEO and Founder

© Leanna Crowley

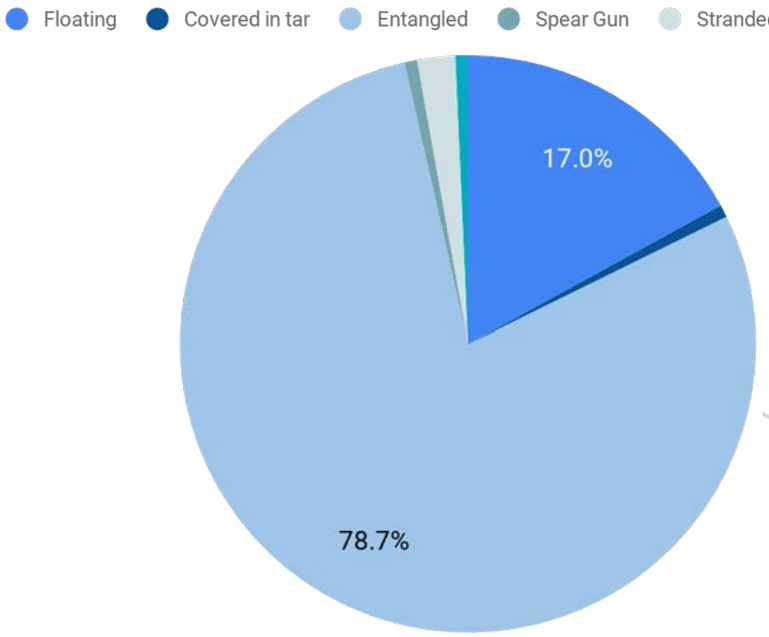
OLIVE RIDLEY PROJECT

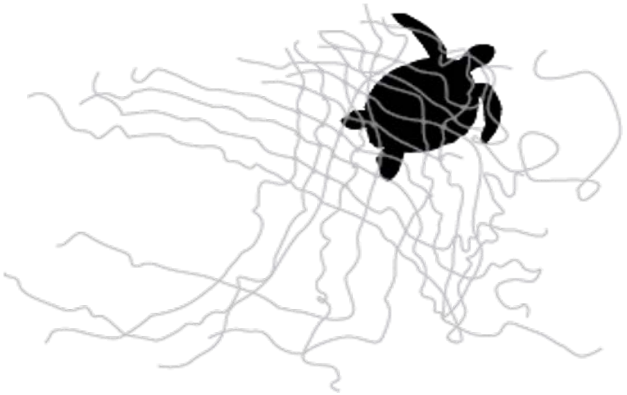
Registered Charity in the UK #1165905

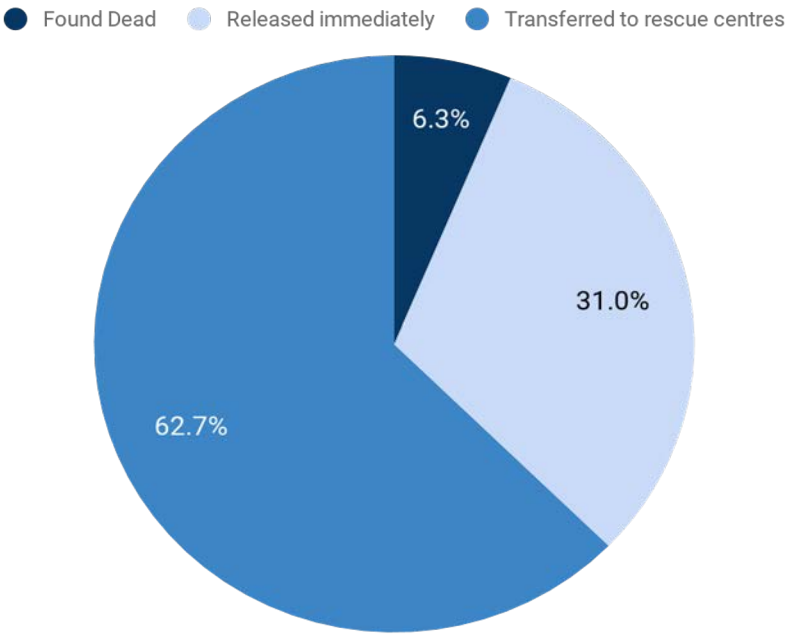
MALDIVES

One olive ridley and one hawksbill entangled in a ghost net in North Malé Atoll

TOTAL NUMBER OF STRANDED TURTLES REPORTED: 142







Olive Ridley: 128
Green : 2
Hawksbill: 12

Azura, olive ridley ghost net amputee

TURTLE RESCUE & REHABILITATION

The Marine Turtle Rescue Centre at Coco Palm Dhuni Kolhu has progressed significantly in it's three years plus of operation. The centre has a fully equipped veterinary clinic with X-ray, ultrasound and surgical facilities. We have also developed a laboratory in order to culture bacteria and perform antibiotic sensitivity testing as well as cytology of samples to be able to administer better targeted treatments for our patients. An ophthalmoscope, x-ray plates and instruments were donated to us this year by a group of guests. We continually improve our facilities through fundraising for new equipment in order to meet our aim of gold standard veterinary care of sea turtles.

-Dr. Jackie Reed, ORP Veterinary Surgeon

The Sea Turtle Rehabilitation Centre at One & Only Reethi Rah in North Malé Atoll opened in October 2019. This facility has one large tank and can accommodate up to two patients, depending on size, and provides non-medical long-term rehabilitation without veterinary care, freeing up tank space for critically injured turtle patients at the Marine Turtle Rescue Centre.

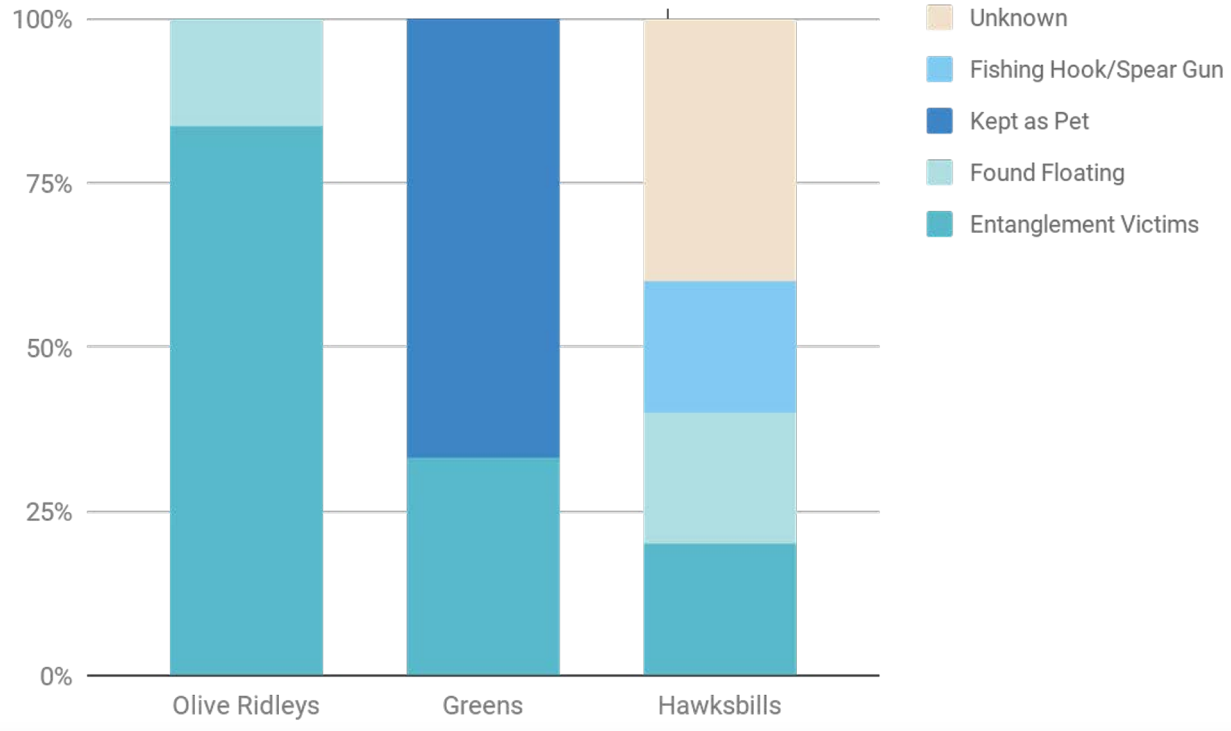
We treat injured sea turtles rescued from across the Maldives. Most of our turtle patients have been found entangled in ghost gear or other marine debris. We also have patients who have been found floating, sick, injured from boat strikes or fishing hooks, and some that we suspect have been kept as pets.

TURTLE PATIENTS

	This Year	Since Opening
New Patients Admitted	39	125
Patients Treated	45	125
Turtles Released	20	70
Turtles Deceased	10	41
Patients Still in Care (ORP/Others)	10	

Elba, olive ridley ghost net entanglement victim

TURTLE PATIENT REASON FOR ADMITTANCE



Reason for admittance by species

Olive ridley turtles make up 78% of patients

Patients requiring flipper amputation: 15

Average length of stay: 76 Days

VISITING VETERINARIANS

The ORP Visiting Veterinarian Program, launched in 2019, provides a unique opportunity for qualified veterinarians specialising in exotic medicine from around the world to obtain hands on experience working with wild sea turtles. We had 6 specialist vets visit the Rescue Centre with the idea that they can teach and exchange knowledge with the resident vet. For example, we had an ultrasonographer who was able to detect follicles in the female sea turtles, and a specialist at radiographs who was able to show our vet how best to take x-rays of our turtle patients. We were also able to determine that our turtle patient Heidi, who we had classed as female, is actually a male!

We had to temporarily suspend the Visiting Veterinarian Program in April 2020 due to the COVID-19 outbreak.

-Dr. Claire Petros, ORP Lead Veterinarian

Visiting Vet Dr. Maria Livesey

"Working with the Olive Ridley Project is an experience I will never forget. I was impeccably cared for and left with a sense of great accomplishment having worked closely with many of the fantastic animals and their very dedicated veterinary team. I had the opportunity to put my clinical skills as an exotic veterinary surgeon into practice in a species that I would otherwise never get to see, let alone work closely with."

Sonya Miles, BVSc CertAVP (ZM) MRCVS,
RCVS Recognised Advanced Practitioner in Zoological Medicine

RESCUE CENTRE VOLUNTEERS

The Rescue Centre also welcomes non-veterinarian volunteers - anyone who is interested in sea turtle conservation and husbandry. The volunteers help us care for the turtle patients and run the Rescue Centre. We launched The Rescue Centre Volunteer Program in 2017 and it is very successful, running at near 100% capacity.

We welcomed 36 volunteers from 12 countries in the last year, including the winner of Coco Palm Dhuni Kolhu's "InTurtleship" competition, Jessica Monteiro, and the 2019 Rolex Scholar of Our World-Underwater Society, Kim Hildebrand. Many of our volunteers have gone on to support us with fundraisers, donations, and increasing awareness about ORP on their social media platforms.

We had to temporarily suspend the Volunteer Program in April 2020 due to the COVID-19 outbreak.


©Alex Mustard

SEA TURTLE POPULATION RESEARCH

Photographic identification (Photo ID) is a non-invasive technique used to identify individual animals in a population and track them over time from natural marks on the body. For sea turtles, it relies on capturing photographs of the unique patterns of scales on the animal's face.

Photo ID can be used as a non-invasive alternative to tagging and data may be analysed through Capture-Mark-Recapture (CMR) methods. This technique allows researchers to conduct longitudinal studies of individuals, yielding information about home range, survival rate, migration patterns, and life cycle. It also provides the opportunity to gather information on populations that are less studied, such as juveniles and males.

ORP began collecting new and historical photographs of foraging and nesting turtles from the Maldives in 2014. This project aims to help fill the gaps in scientific knowledge by providing detailed information on the abundance, distribution, population growth rate, apparent survival, and nesting frequency of hawksbill and green sea turtles.

We collect sightings data for both nesting and foraging green (*Chelonia mydas*) and hawksbill (*Eretmochelys imbricata*) sea turtles in Kenya, Maldives, and Oman. Olive ridley (*Lepidochelys olivacea*), loggerhead (*Caretta caretta*), and leatherback (*Dermochelys coriacea*) sea turtles are present in these countries; however, greens and hawksbills are the most abundant in the regions where our teams operate.

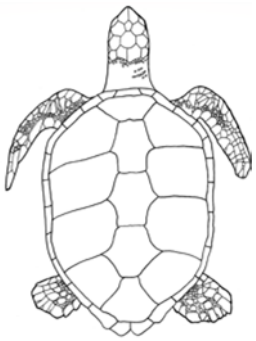
Our flagship study is our Maldives project, where we have a 6-year data set for some atolls. We started collecting photo-ID data from Kenya in 2018 and Oman in 2019, and, though it is too soon to analyse these data using CMR, we hope to replicate our Maldivian population studies in these countries as well.

All of our sightings from Maldives, Kenya, and Oman have now been moved over to the Internet of Turtles (IoT) platform. This new conservation tool has the potential to greatly improve and facilitate data collection for sea turtles by using photo identification data. The IoT platform combines data analytics with individual animal tracking. IoT uses computer vision to compare new IDs to the existing database and Wildbook to store metadata.

Unfortunately, the COVID-19 pandemic has resulted in travel restrictions and temporary suspension of research and educational outreach in the areas we work. We hope to be back in the water photographing turtles very soon!

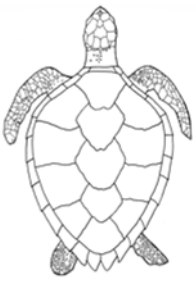
- Dr. Jillian Hudgins, ORP Senior Project Scientist

TURTLE SIGHTINGS & NEW INDIVIDUALS MALDIVES



GREENS

Total Sightings: 7,280
Total Individuals: 828



HAWKSBILLS

Total Sightings: 19,033
Total Individuals: 3,151

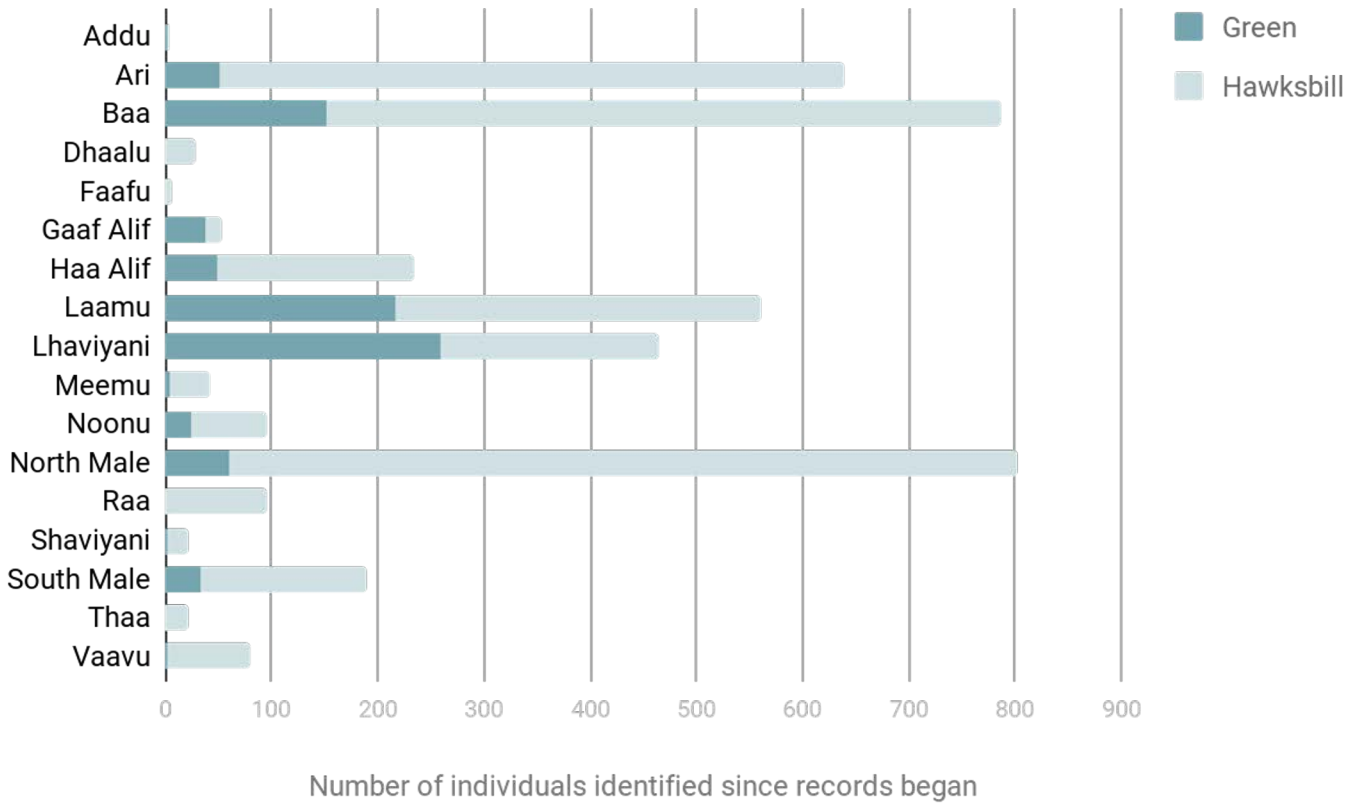
	This Year	Total Since Records Began
Total Number of Turtle Sightings	4,596	26,313
Total Number of New Individuals	644	3,979
Total Overall Growth in Sightings	21%	N/A

HK3289, Brownie, juvenile hawksbill, North Malé

TURTLES IN MALDIVES

North Malé Atoll is by far home to the largest identified turtle population overall as well as the largest population of hawksbills. Lhaviyani Atoll is home to the largest population of green turtles followed closely by Laamu Atoll.

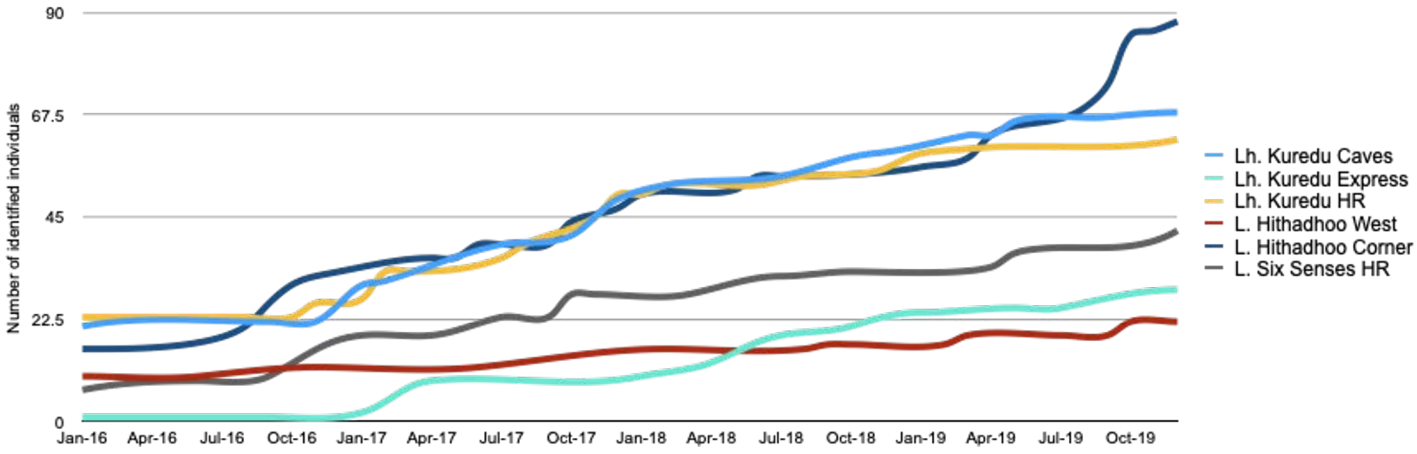
The large number of resorts in the central atolls (North Malé, Ari, Baa, South Malé) as well as a relatively consistent effort by our team members in Haa Alif, Laamu, Lhaviyani and North Malé has resulted in much better data coverage from these atolls. The northern and southern atolls, with relatively fewer resorts, still have few turtles photographed.



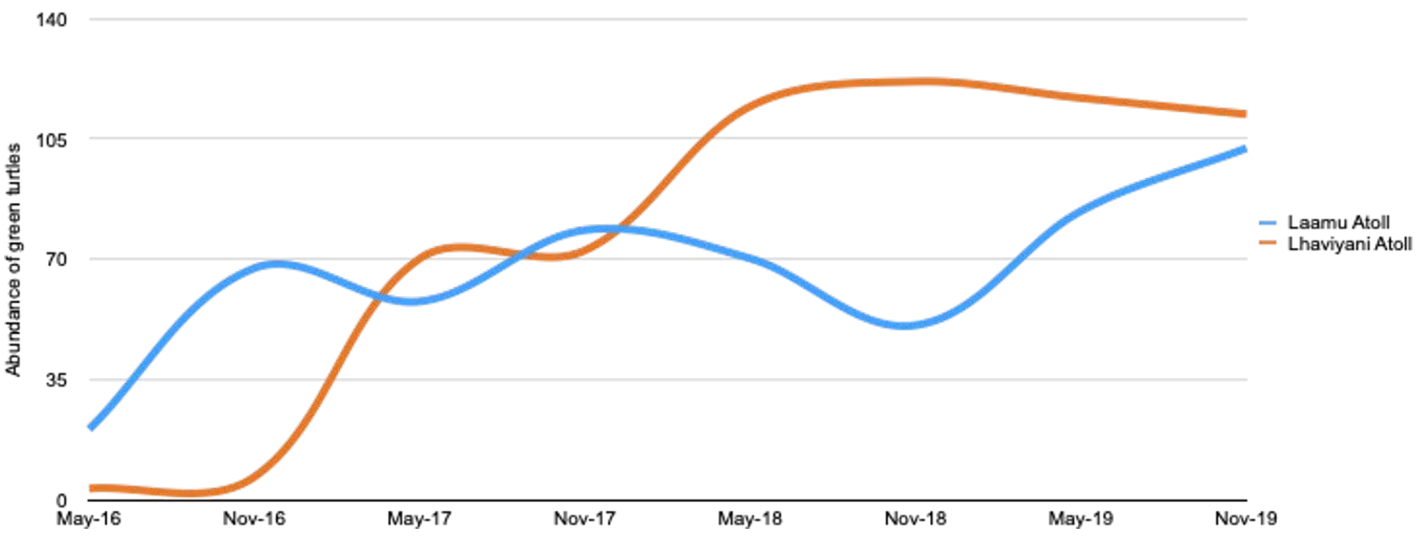
GR706, Snif, Lhaviyani Atoll

GREEN TURTLE RESULTS

The top graph shows the discovery curve (total number of identified individuals over time) from 2016-2019 for 3 reefs in Lhaviyani Atoll and 3 reefs in Laamu Atoll. A flattening of the curve indicates that all turtles at that reef have been photographed (saturation of effort). Saturation appears to have been reached at all sites except Hithaadhoo Corner.



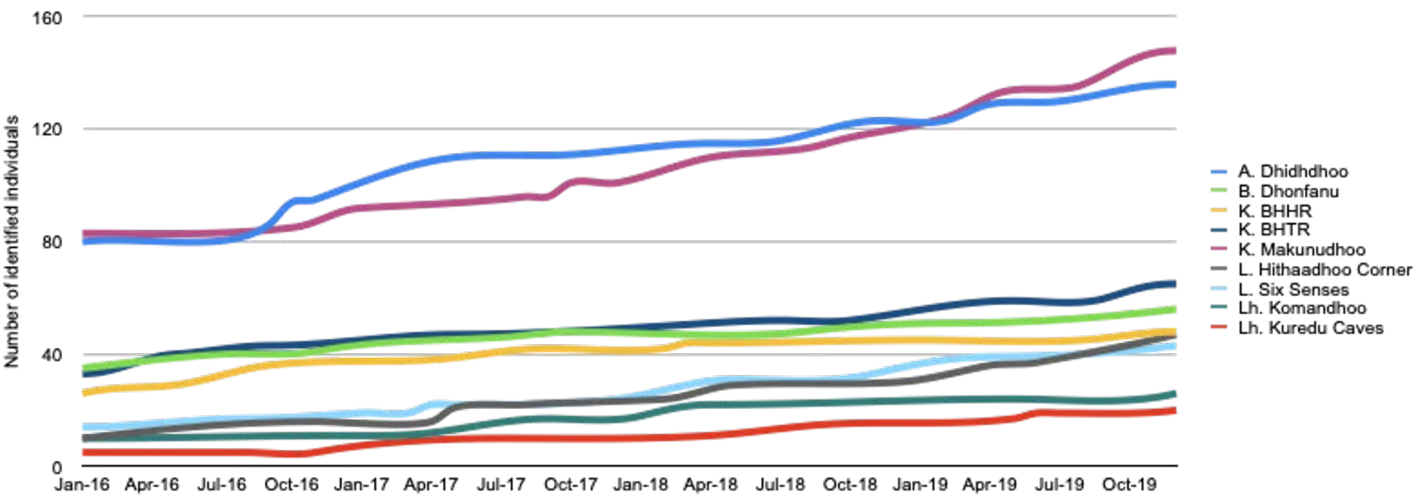
The bottom graph is a result of capture-mark-recapture analyses using program RMark. It shows the population over time (abundance) for green turtles in Laamu and Lhaviyani Atolls from 2016 to 2019. Populations in both atoll have increased over time, though there have been fluctuations.



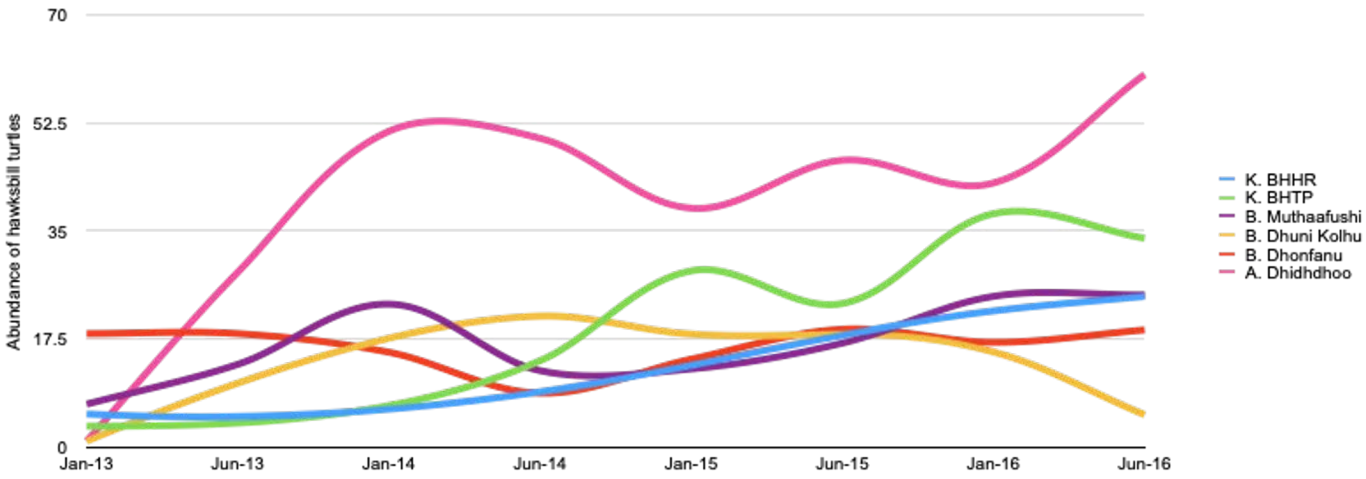
HK3452, Sonny, North Malé Atoll

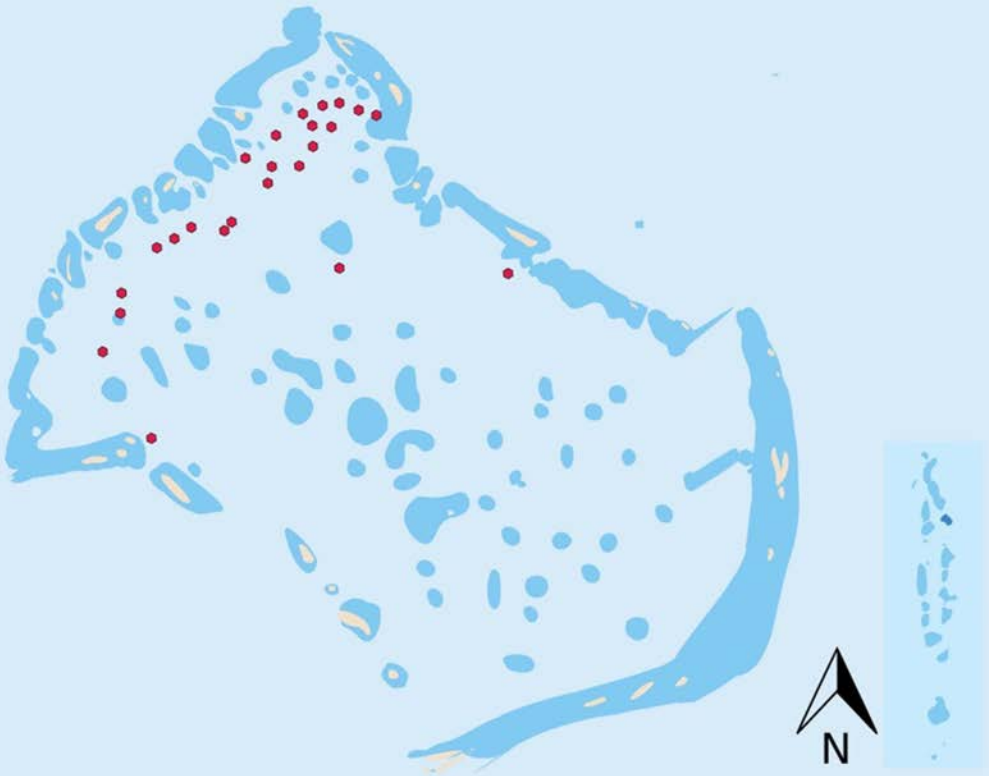
HAWKSBILL TURTLE RESULTS

The top graph shows the discovery curve (total number of identified individuals over time) from 2016-2019 for reefs in 5 atolls. A flattening of the curve would indicate that all turtles at that reef have been photographed (saturation of effort); however, saturation has only been reached at a few reefs despite consistent effort through these atolls.



The bottom graph is a result of capture-mark-recapture analyses using program RMark. It shows the population over time (abundance) for hawksbill turtles in 3 atolls from 2013 to 2016. Populations have increased over time at most reefs. Analyses of 2016-2019 data and data from other atolls are ongoing.





LHAVIYANI ATOLL, MALDIVES

ORP has partnered with Prodivers Maldives and Kuredu Island Resort & Spa since October 2017. In 2019/2020 ORP's Sea Turtle Biologist, Kristina Loosen, researched the sea turtle population of Lhaviyani Atoll using photo identification. She spent 285 hours in water surveying different sites.

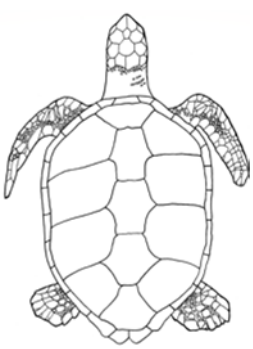
Kristina also joined snorkelling & diving excursions to educate the guests about sea turtles, reaching ~1,000 snorkelers & 1,300 divers this year.

Additionally, Kristina hosted special events in cooperation with the Prodivers Team & the Kuredu Island Resort staff including World Turtle Day, World Oceans Day, Shark Week and the Clean Up the World Day.

Besides the photo-ID, ORP also collects data on nestings in Lhaviyani Atoll. In the reporting period, 3 nests were recorded & 218 live hatchlings were counted. ORP also assists with ghost net recovery and rescue of entangled turtles. In Lhaviyani Atoll, we rescued 22 entangled turtles & collected 14 ghost nets.

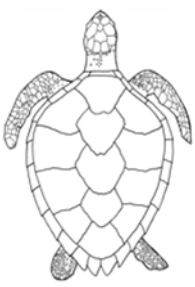
The cooperation between the resort and ORP has been strengthened by providing more detailed information about our work to staff, particularly about turtle nesting period. One of the main goals for the coming year is for Kuredu to join the "Protect Maldives Seagrass" initiative. Our work in Lhaviyani Atoll was temporarily suspended in March 2020 due to the COVID-19 outbreak.

-Kristina Loosen, ORP Sea Turtle Biologist, Lhaviyani Atoll



GREENS

Total Sightings: 3,305
Total Individuals: 260

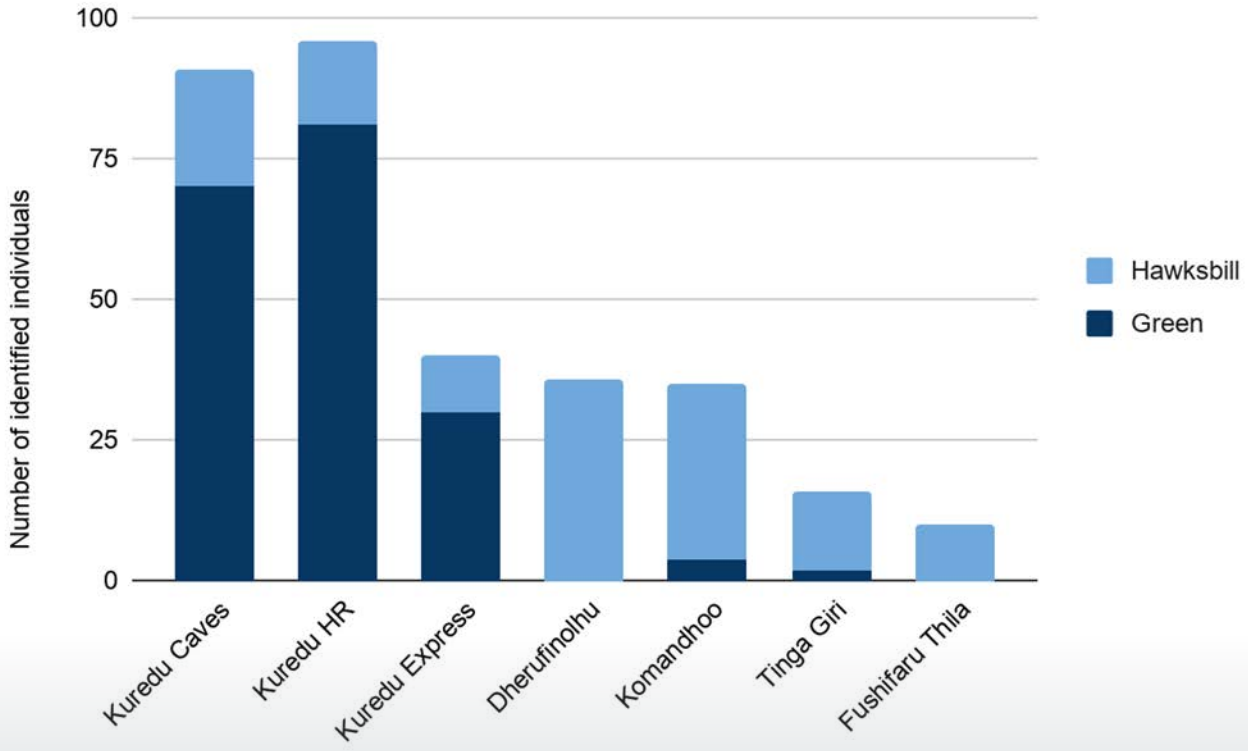


HAWKSBILLS

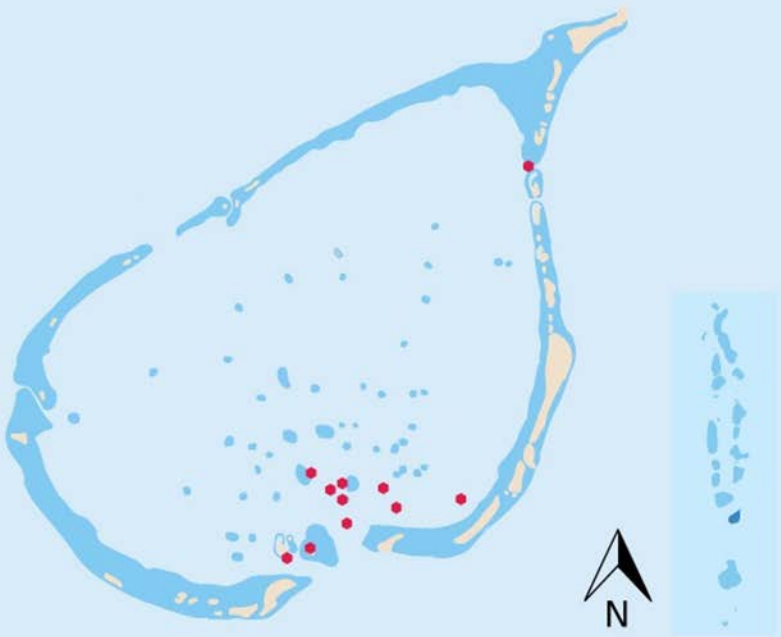
Total Sightings: 641
Total Individuals: 205

GR744 Baby Wilma seen 45 times at Kuredu Hse Reef

TURTLE SIGHTINGS & NEW INDIVIDUALS LHAVIYANI



	This Year	Total Since Records Began
Total Number of Turtle Sightings	1,207	3,964
Total Number of New Individuals	105	465
Total Overall Growth in Sightings	41%	N/A



LAAMU ATOLL, MALDIVES

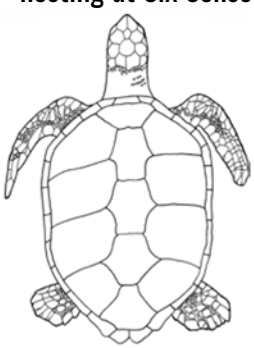
ORP and Six Senses Laamu have been partners since April 2018 with an ORP sea turtle biologist permanently stationed at the resort. The sea turtle biologist is responsible for studying the local turtle population, maintaining Laamu's photo ID database, monitoring turtle nests - both at the resort and on nearby islands - and collecting data on ghost nets found in and around the atoll. With consistent surveys, ORP aims to better understand the size of Laamu's turtle population and identify turtle hotspots. In Laamu, ORP forms part of the Maldives Underwater Initiative (MUI), which combines the research and conservation efforts of the marine team at Six Senses Laamu, and its 3 partner NGOs - Manta Trust, Blue Marine Foundation and ORP. MUI are currently working to establish a network of marine protected areas in Laamu.

2019/20 was another fantastic year for turtle nesting at Six Senses Laamu.

Throughout the season, ORP maintained sustainable nesting and hatching protocols to best balance guest experience and turtle welfare. ORP also monitors nesting on Gaadhoo, an uninhabited island thought to be one of the most significant green turtle nesting sites in the Maldives; however, the nesting beach is subject to illegal poaching. This year we recorded 39% of nests as poached. The COVID-19 outbreak postponed nesting surveys on Gaadhoo in March 2020.

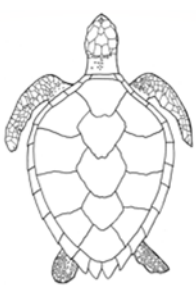
ORP continues to establish a presence within the local community. ORP assisted with several school visits in 2019/20 and delivered the seagrass module for the "Hello Hallu" educational programme. ORP was also involved in the organisation of the 2019 Laamafaru Festival. In 2019, the festival drew an audience of 1,500.

-Joanna Goodfellow, ORP Sea Turtle Biologist, Laamu Atoll



GREENS

Total Sightings: 2,539
Total Individuals: 216

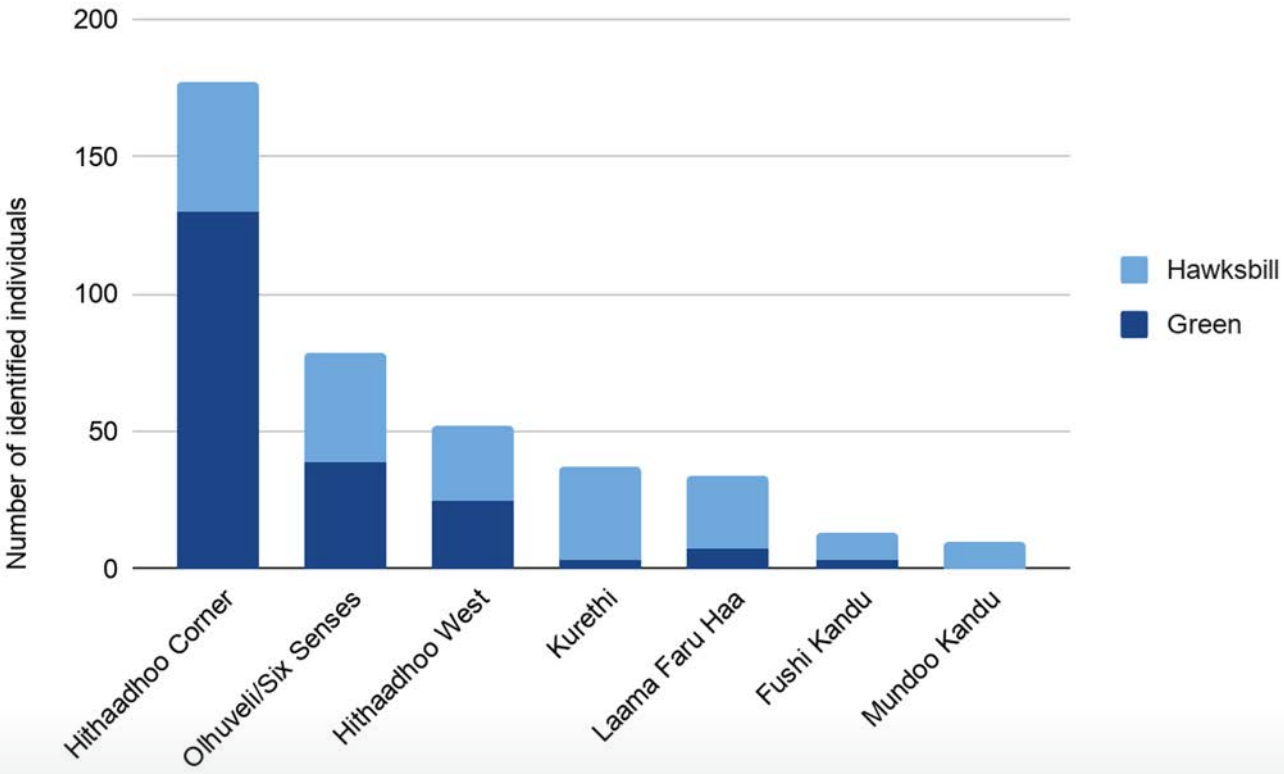


HAWKSBILLS

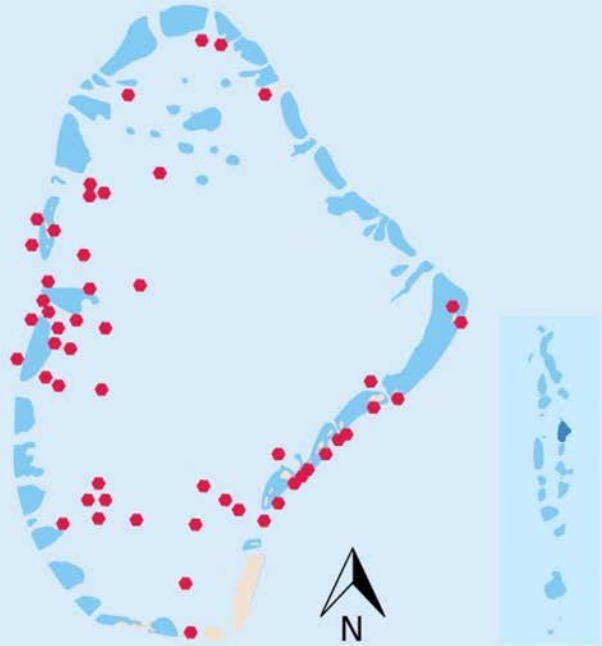
Total Sightings: 1,473
Total Individuals: 344

GR963 Cutie seen 80 times at Hithadhoo Corner

SIGHTINGS & NEW INDIVIDUALS LAAMU



	This Year	Total Since Records Began
Total Number of Turtle Sightings	1,639	3,876
Total Number of New Individuals	142	560
Total Overall Growth in Sightings	73%	N/A



NORTH MALÉ ATOLL, MALDIVES

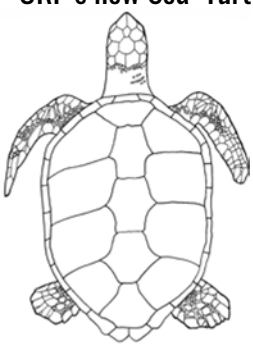
ORP partnered with One & Only Reethi Rah in December 2018. Since then, an ORP sea turtle biologist has been permanently stationed at the resort. Sea turtle biologist Laura Whiteley carries out snorkeling trips for guests, and a monthly trip and educational presentation for staff. She also presents to the kid's club weekly.

Photo ID is a big part of our work in North Malé Atoll. We communicate closely with neighbouring resorts in North Malé Atoll including: Coco Bodu Hithi, Meeru, Grand Park Kodhipparu, Gili Lankanfushi, and Anantara Dhigu. The marine biologists send their turtle ID photos to ORP and we record resightings and identify new individuals. This research has significantly contributed to our overall knowledge of sea turtle populations in North Malé Atoll.

ORP's new Sea Turtle Rehabilitation Centre at One & Only Reethi Rah opened in October 2019. The "turtle tank" is a community funded project; the staff at One & Only Reethi Rah raised all funds for the construction by having fundraiser events over the course of a year. The first turtle patient, Azura, arrived from the Marine Turtle Rescue Centre at Coco Palm Dhuni Kolhu on 16th October 2019. A few days later, the resort organised an opening ceremony with guests and staff from the resort. Azura was joined by Eve, another patient from the Marine Turtle Rescue Centre, in January 2020 and the Rehab Centre is now home to two long-term residents.

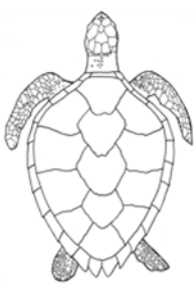
Educational and outreach activities this year, in addition to regular guest and staff events, included World Sea Turtle Day in June, representing ORP at the Whale Shark Festival in July, and a visit from Immaduddin School in Malé in November.

-Laura Whiteley, ORP Sea Turtle Biologist, North Malé Atoll



GREENS

Total Sightings: 131
Total Individuals: 60

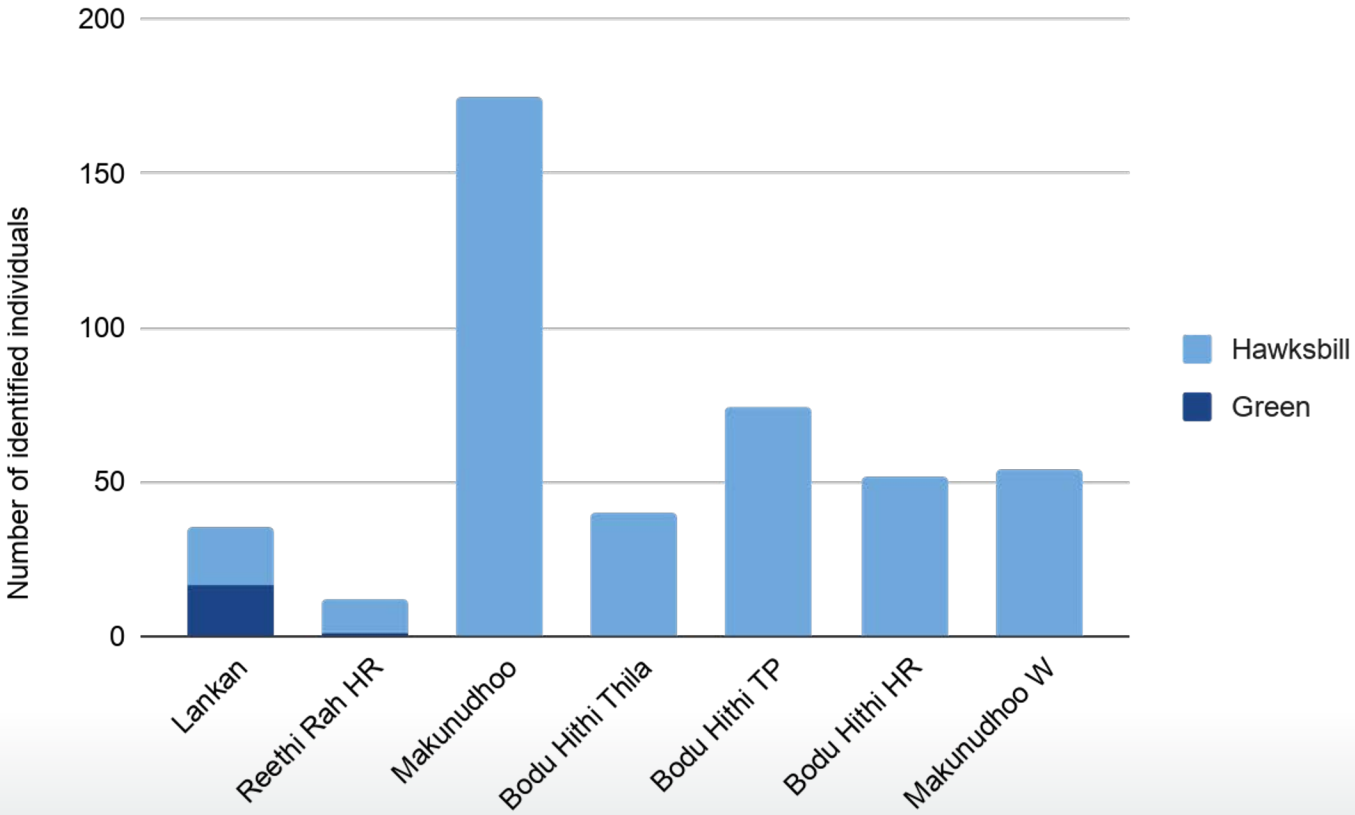


HAWKSBILLS

Total Sightings: 9,374
Total Individuals: 742

HK568 Junior was seen 84 times at Makunudhoo Reef

TURTLE SIGHTINGS & NEW INDIVIDUALS NORTH MALÉ



	This Year	Total Since Records Began
Total Number of Turtle Sightings	1,521	9,505
Total Number of New Individuals	89	802
Total Overall Growth in Sightings	19%	N/A

HAA ALIF SEA TURTLE RESEARCH EXPEDITIONS

Haa Alif Atoll is situated in the far north of Maldives where very little scientific work has been done. The lack of data in this region is what scientists call a “black hole”. We aim to fill this gap so that we can accurately interpret sea turtle population and movements in the Maldives. Due to its remote location, Haa Alif Atoll has very few resources to conduct dedicated sea turtle research or run marine conservation projects. In addition to our research, we drive community projects, working with the local schools, our local partner Island Development and Environmental Awareness Society (IDEAS), and with members of the community to help tackle common issues affecting marine habitats for turtles.

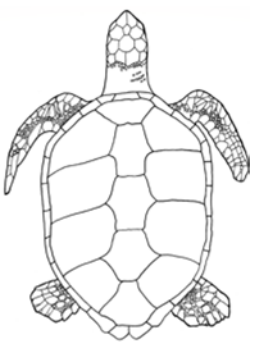
This project is sustained through the generous contributions of our expedition volunteers and brings economic benefits to the island of Kelaa in the form of ecotourism.

We completed two research expeditions in the region during the reporting period; the first in July 2019 and the second in March 2020. We were joined by 12 volunteers from 4 different countries.

In total, we completed 67 in-water surveys and added a total of 171 turtle sightings and 136 individual turtles to our database. In addition we record megafauna sightings, such as sharks, dolphins and rays. We recovered 8 ghost nets and are happy to report that we found no entangled turtles during these expeditions.

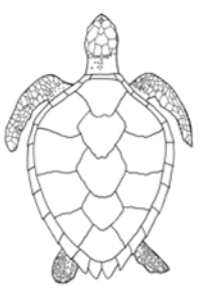
The expedition teams also organise beach clean-ups in collaboration with the Island Council and Parlay Maldives. 50 participants collected a total of 325 kg of waste in one hour during the first expedition. All community outreach had to be suspended due to the COVID-19 outbreak during the second expedition.

- Ibrahim Shameel, ORP Project Coordinator, Maldives



GREENS

Total Sightings: 53
Total Individuals: 50

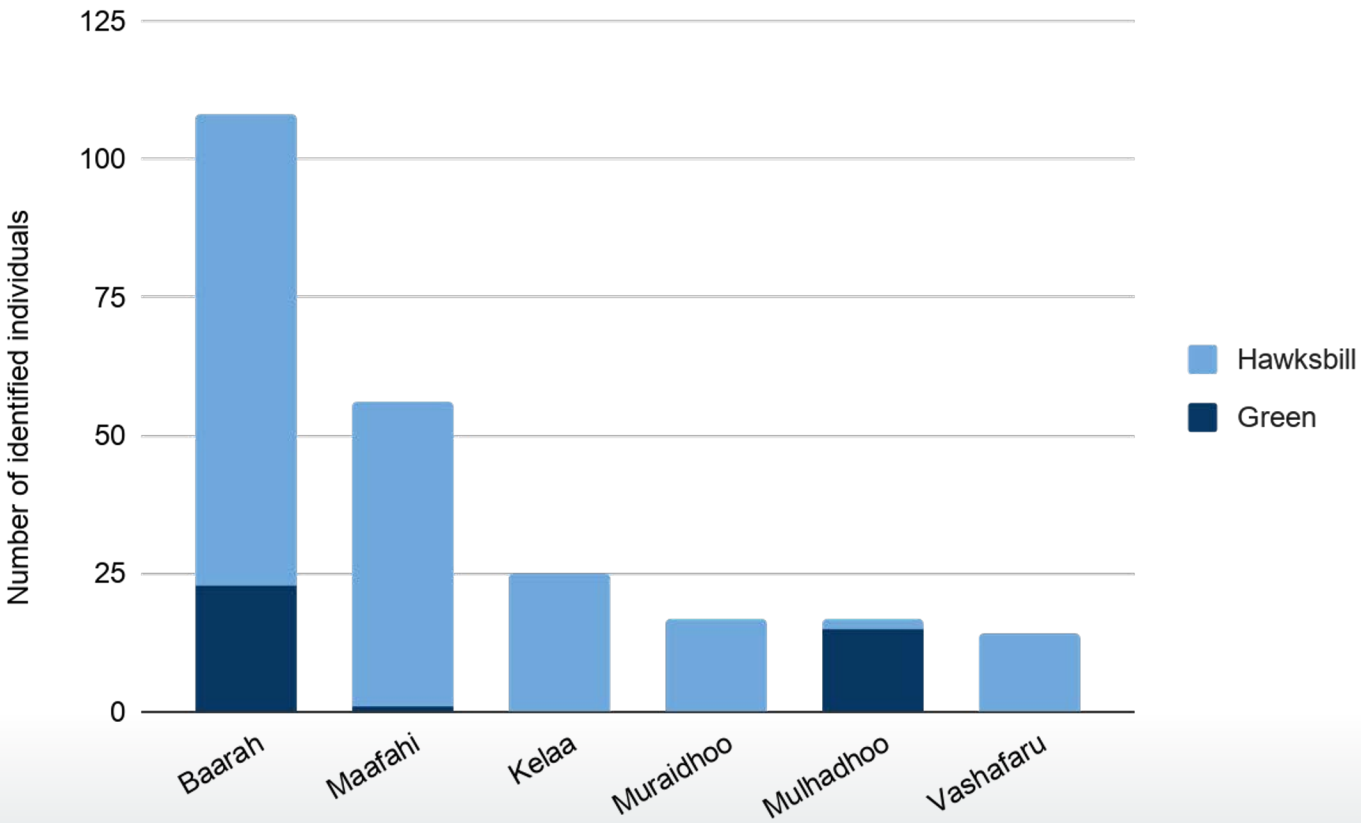


HAWKSBILLS

Total Sightings: 255
Total Individuals: 185

HK3129 Susie seen 4 times at Maafahi Reef

TURTLE SIGHTINGS & NEW INDIVIDUALS HAA ALIF



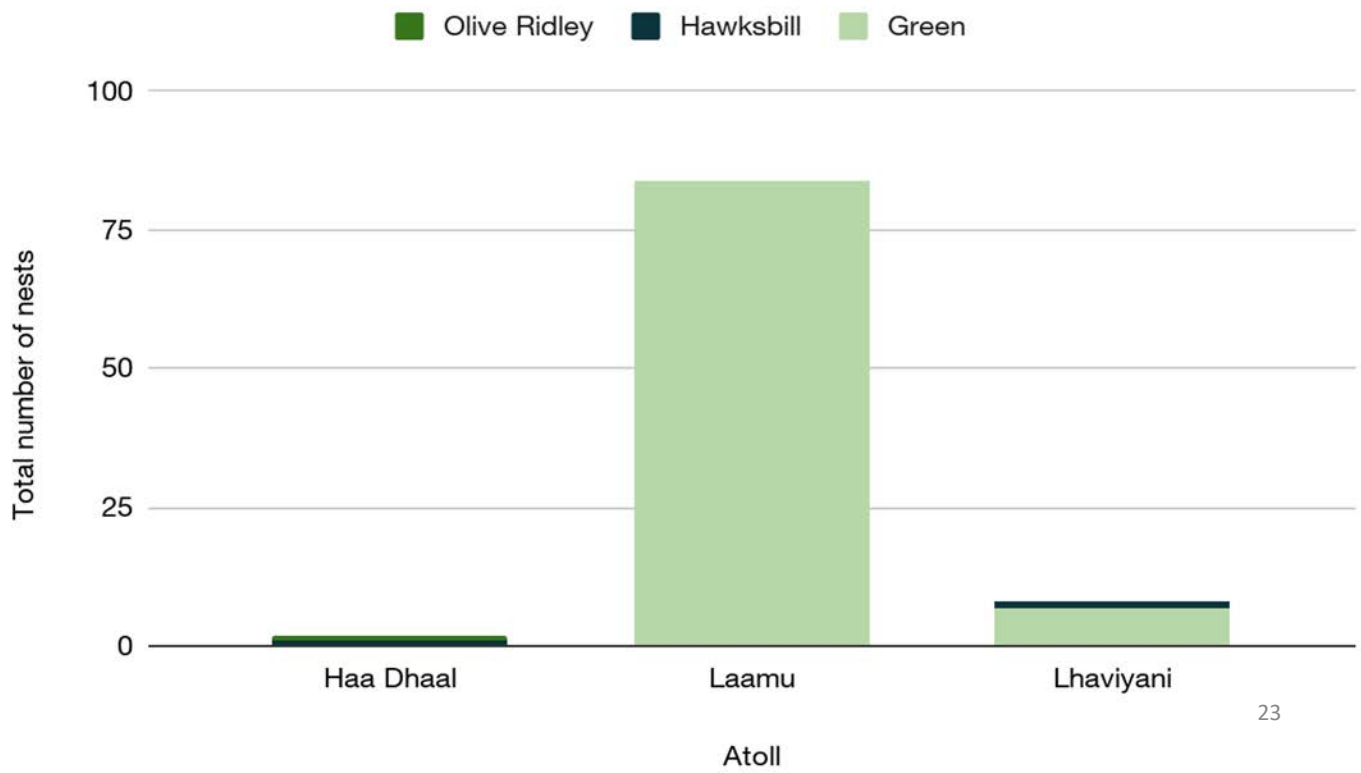
	This Year	Total Since Records Began
Total Number of Turtle Sightings	171	308
Total Number of New Individuals	136	235
Total Overall Growth in Sightings	125%	N/A

Green turtle hatchlings at Finolhu, Baa Atoll

RECORDED SEA TURTLE NESTING ACTIVITY

Total Number of True Nests:	94
Total Number of False Crawls:	63
Total Number of Live Hatchlings Counted:	2,150* (to date, not all nests have hatched)
Average Hatching Success:	75%
Average time of incubation:	59 days

*Data for nesting is limited due to the small number of marine biologists collecting nesting information.



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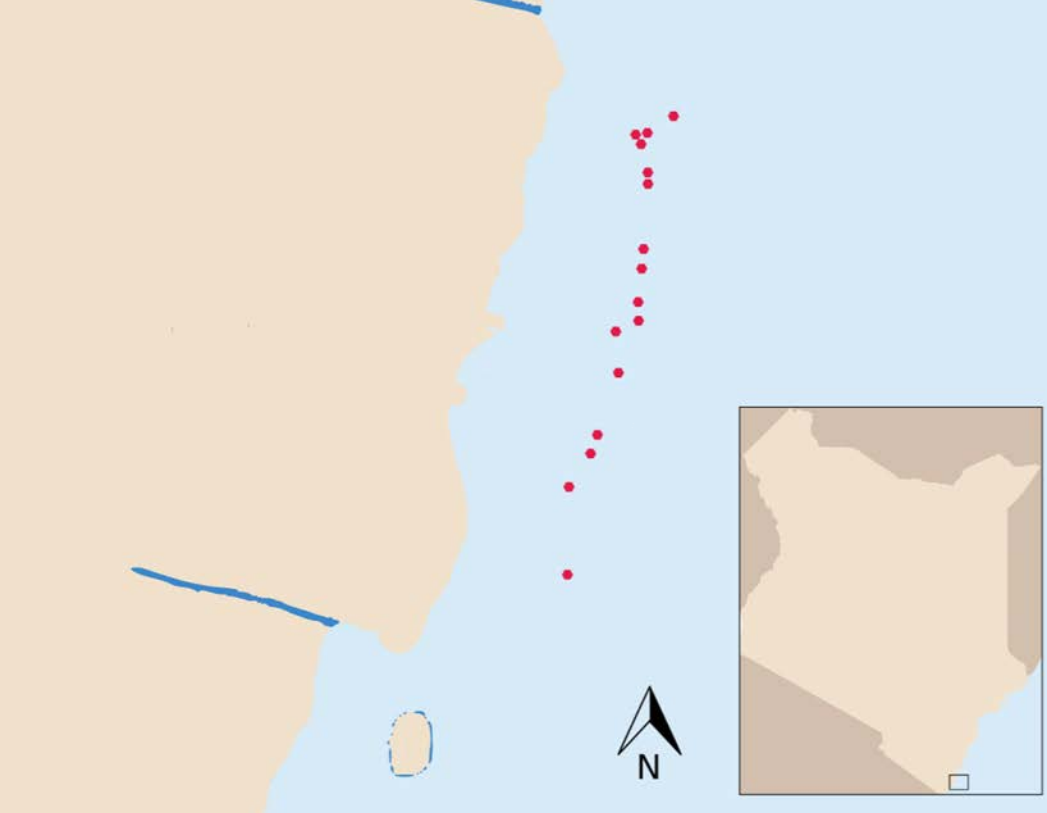
KENYA



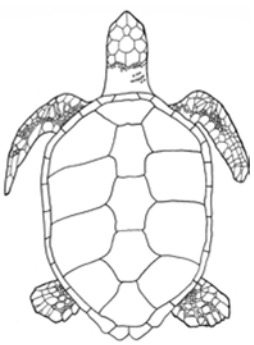
DIANI BEACH, KENYA

ORP has been running a sea turtle ID program in Kenya since December 2018, focusing our work in the Diani-Chale Marine National Park and Reserve. The reserve is located approximately 25 km south of Mombasa. This year, ORP's team expanded to include a Kenyan marine biologist. The expansion of the team allowed us to initiate exploration dives along the reef, covering areas that are not regularly visited by the local dive centres, adding more than 5 km of reef covered to the usual 3 km monitored. To date, ORP in Kenya has over 589 hours of in-water survey effort. Additional data has been submitted by local partners such as Diani Turtle Watch (by-caught turtles, Diani), Jumba Turtle Patrol (nesting turtles, Mtwapa, Mombasa), and REEFolution (foraging turtles, Shimoni/ Kisite Marine Park).

Our team also assists with educational activities at the Marine Education Centre (MEC), and, in collaboration with the Conservation Education Society (CES), actively participate in guest education activities and guided tours. In June 2019, ORP was one of the main organizers and participants of the first Diani Sea Turtle Festival, run by MEC. We also partner with Diving the Crab, providing guidelines to divers on safe interactions with turtles, whale sharks and marine mammals and marine conservation best practices during daily dive excursions.

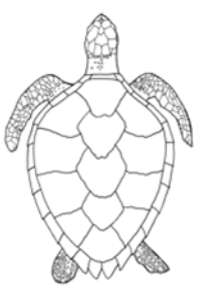
Our work in Kenya was temporarily suspended in April 2020 due to the COVID-19 outbreak.

- Dr. Joana Hancock, ORP Project Manager, Kenya



GREENS

Total Sightings: 1,935
Total Individuals: 441

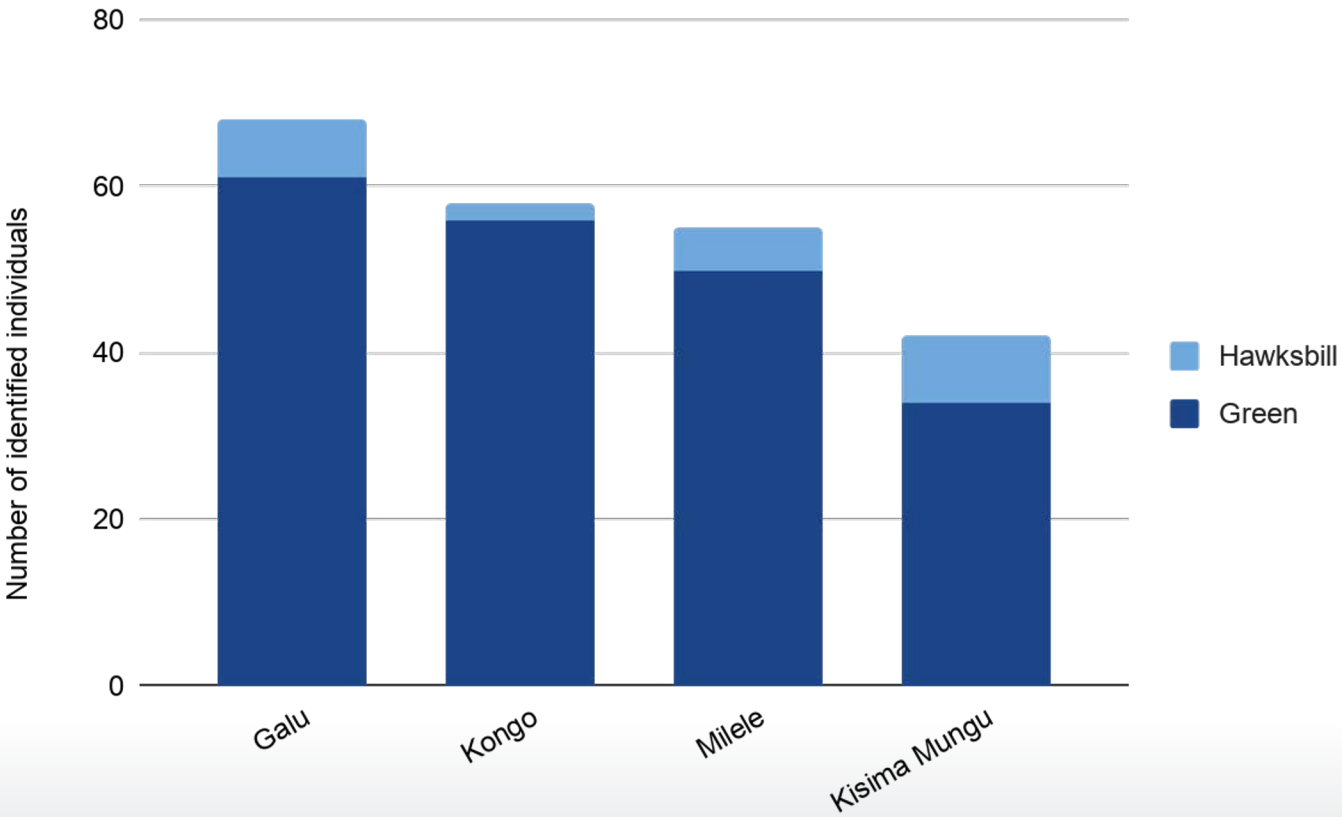


HAWKSBILLS

Total Sightings: 256
Total Individuals: 58

Hope (GR006): Most sighted green turtle in Galu

TURTLE SIGHTINGS & NEW INDIVIDUALS KENYA



	This Year	Total Since 2018
Total Number of Turtle Sightings	1,234	1,987
Total Number of New Individuals	257	492
Total Overall Growth in Sightings	164%	N/A

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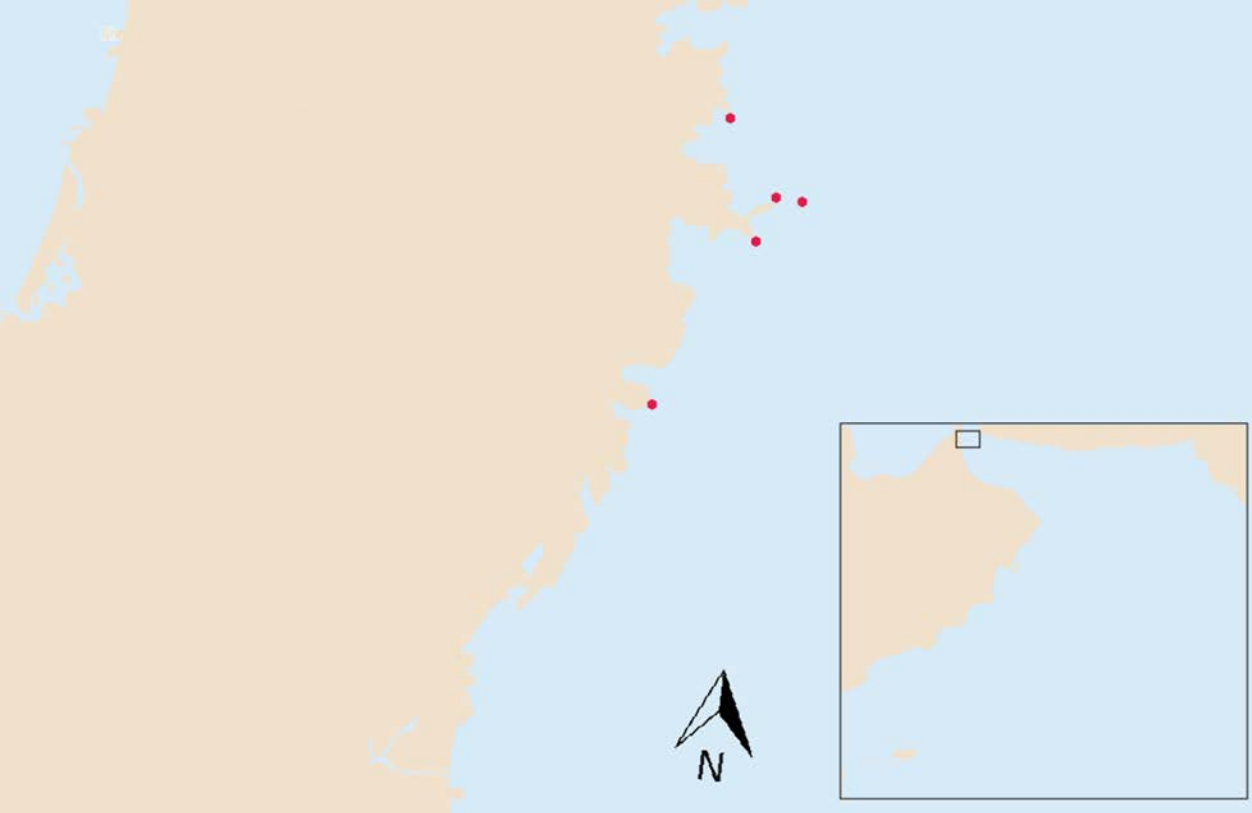
OMAN



MUSANDAM, OMAN

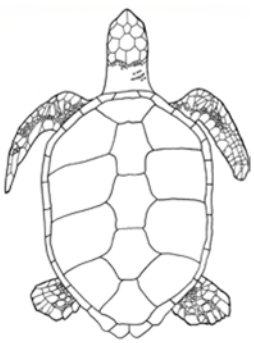
ORP partnered with Six Senses Zighy Bay in January 2019 and the Musandam, Oman project keeps growing. It is a multi-faceted project, aiming to monitor sea turtle populations in the area, and working alongside local fishing communities to combat the ghost gear issue in the region.

We now work with the Ministry of Environment and Climate Affairs (MECA) to promote our goals to reduce ghost gear in the region and support their reef clean efforts and participate with regional beach cleans and school visits with a specific focus on marine environmental education and sea turtles. We are also working with BEAH - the company responsible for managing waste and recycling in Oman.

They have made plans to provide a skip in Dibba Marina for fishermen to dispose of their broken, old or otherwise unusable fishing equipment in a responsible manner. This is to be accompanied with suitable education about ghost gear and its impacts to encourage a positive dialogue with the fishing community. In February 2020 we received permission from MECA to remove ghost gear from coral reefs this will enable independent clean up efforts of divers for the surrounding dive sites.

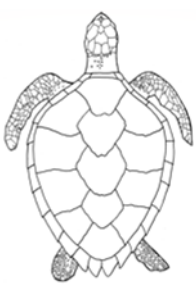
Our work in Oman was temporarily suspended in March 2020 due to the COVID-19 outbreak.

-Jane Lloyd, ORP Sea Turtle Biologist, Oman



GREENS

Total Sightings: 56
Total Individuals: 34

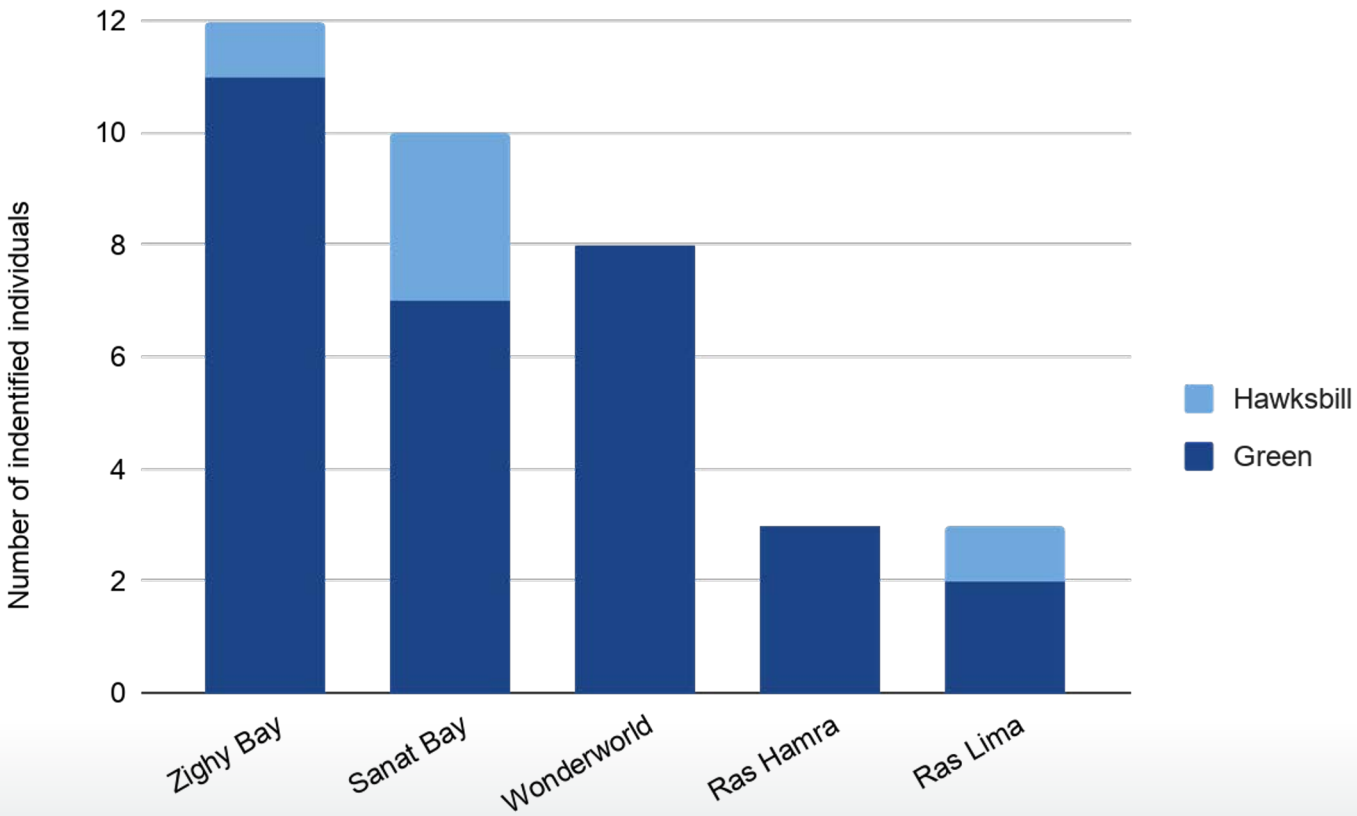


HAWKSBILLS

Total Sightings: 12
Total Individuals: 6

GR008 Freckles seen at Wonderworld Reef

TURTLE SIGHTINGS & NEW INDIVIDUALS OMAN



	This Year	Total Since 2019
Total Number of Turtle Sightings	49	68
Total Number of New Individuals	24	40
Total Overall Growth in Sightings	387%	N/A

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PAKISTAN

PAKISTAN

Our Pakistan project in Abdul Rehman Goth (ARG) fishing community continues to progress. The project aims to remove ghost gear from the ocean environment and to create value out of waste through the power of community and creative ideas. Finding new ways to reuse ghost gear depends on the experience and innovative thinking of people from different sectors of economy and so we have explored various initiatives in the past year.

In addition to working with local fishing communities we focus on education and outreach. During the last year we visited 5 schools, educating almost 400 school children from grades 5 upwards. We talk about the dangers of ghost gear, the struggles the fishers are currently facing and the work of ORP in Pakistan. One school, Karachi Grammar School, donated over 1,000 books to the ARG village school and this was greatly appreciated.

Our ghost gear recoveries still continue along Karachi coastline by qualified and experienced divers. These *ad hoc* and voluntary recovery dives are done in collaboration with the ARG community and Indus Scuba Divers. The ARG community let volunteer divers know where lost gear is positioned, who then remove it. The recovered gear is either given back to the fishers to reuse or given to the fishers to recycle into dog leashes, jewelry etc.

This year our Project Coordinator, Usman Iqbal, and In Field Assistant, Asif Baloch, both became PADI Certified Open Water Divers, thanks to our partners Indus Scuba. They hope to gain experience and knowledge of diving so that they can contribute to voluntary recover ghost gear in the future.

-Usman Iqbal, Project Coordinator, Pakistan

	This Year	Total Since 2016
Ghost Nets Recovered	533 kgs	4200 kgs
Total Overall Growth Ghost Net Recovery	14%	N/A

GHOST NET REPURPOSING - A CIRCULAR ECONOMY PROJECT

Abdul Rehman Goth (ARG) is a is a centuries-old fishing village with a population of around 2000 people and 300 fishing boats. Like so many traditional fishing communities, climate change, industrial fishing and overfishing strongly affect this community. ORP is working on ways to reuse ghost gear recovered in the area to provide an alternative income for the community. So far, volunteers have recovered more than 4.2 tons of ghost gear from the sea and beaches near the village!

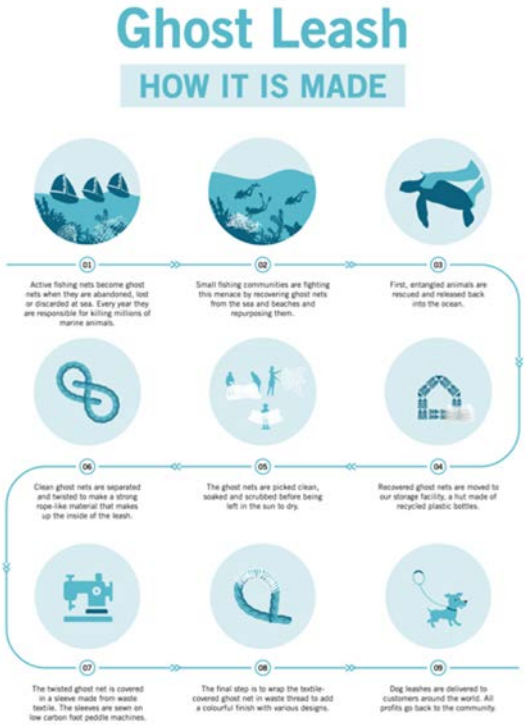
Whilst the men of the village may travel far away for work, the women are more restricted in terms of mobility due to the lack of public transport. The design and sale of ghost net bracelets and dog leashes provide local work; work that can provide a significant addition to the household income of a fisher family.

Last year ORP started producing donkey harnesses and dog leashes through a collaboration with the Ayesha Chundrigar Foundation (ACF) under the WWF Pakistan Green Innovation Challenge. Unfortunately, this dog leash design included a small proportion of virgin plastic to help with aesthetics. We wanted to continue to make dog leashes, but not have to rely on plastics in the design.

For this we partnered with Waqar J Khan, founder of Nasheman and a sustainable fashion designer with experience working with communities in Pakistan. He redesigned our dog leash using twisted monofilament ghost nets wrapped in waste denim cloth and decorated with waste fabric. The dog leash is now 100% recycled (except the clip) and no longer uses virgin plastic in its design.

Each dog leash is more efficiently manufactured (we also purchased a pedal sewing machine to help) which means we can make more leashes in less time and with extremely high quality.

All leashes are strength tested to 70 kg to ensure safety. Each leash uses 880 sq feet / 82 sq metres of ghost net, that would otherwise be polluting local beaches, and waste materials that would otherwise be sent to a landfill. We plan to sell the Ghost Leash online and explore further ghost net jewellery designs as soon as the COVID-19 restrictions allow for travel.



All profits from the sales of Ghost Leashes go back to the community and we hope to provide a valuable and additional income to the fishing community of ARG (1000 PKR / £5 per artisan per ghost leash and 500 PKR / £2.50 per bracelet). We plan to expand the project into more villages as we move into 2021.

FURTHER RESEARCH

RESEARCH

Between 2019 – 2020 ORP continued to push the boundaries and pioneer research techniques to analyse the impact of ghost gear in the Indian Ocean, identify responsible fisheries, and work towards filling existing data gaps in sea turtle research.

In addition to ghost gear and sea turtle population analyses, we hope to glean information about what makes habitat suitable for juvenile olive ridleys so that we can determine juvenile foraging sites in the Indian Ocean. This project, led by ORP researcher, Rushan Bin Abdul Rahman will use satellite tags attached to rescued juvenile olive ridleys. Movement ecology statistics will then be used to determine which points along their track suggest possible foraging behaviour, this can then be correlated with characteristics that are important for sea turtle development (e.g., sea surface temperature, productivity).

With this information we will be able to identify what environmental characteristics make habitats suitable for juvenile olive ridley sea turtles in the region. We would like to take this opportunity to extend our gratitude to Mr. Thorsten Albrecht for providing the resources for this tagging project to start.

For the first time we are documenting the presence of *Sangivorous* ectoparasites in sea turtles found entangled in the Maldives. This project, led by ORP researcher Dr. Stephanie Köhnk hopes to expand its study more broadly to provide a comprehensive assessment of sea turtle parasites in the region. In addition, Stephanie is leading a behavioural study of green sea turtles to understand the impact of tourism on a resident turtle population in the Maldives.

We hope to resume our in-field research efforts once the COVID-19 pandemic restrictions have been lifted.

-Dr. Martin Stelfox, ORP CEO and Founder

GHOST NET RESEARCH

Between 2019 – 2020 ORP were able to recover and measure 61 ghost net conglomerates consisting of 195 fragments in the Maldives. A recently published report by ORP and the University of Derby used statistical tools to analyse ghost gear and turtle entanglement data between 2013 and 2017. The report revealed seasonality (north east monsoon), large mesh size, and absence of floats or buoys as key drivers increasing the likelihood of olive ridley entanglements in the Maldives. This research suggests that the number of olive ridleys reported in this study may be insignificant in comparison to the number of olive ridleys entangled in the region (3,400 – 12,200).

ORP also highlighted that trawl and gill net fisheries are major contributors to ghost gear found in the Maldives. However, additional research using ocean modelling found that purse seine fisheries operating in the Western Indian Ocean are high risk fisheries that contribute to ghost gear found in the Maldives and this is corroborated by the presence of drifting Fish Aggregating Devices (dFAD) reported drifting into Maldivian territory.

Our genetic analyses of entangled olive ridleys found in the Maldives revealed two major source populations (Eastern India and Sri Lanka) with occasional migrant visitors from further afield. Whilst the impact of ghost nets on the large east Indian population may be minimal, the impact to the smaller and genetically distinct Sri Lankan population is far more worrisome and may impact yearly recruitment by as much as 41%.

We are aiming to increase our ghost gear and turtle entanglement datasets so that we are able to improve statistical modelling by strengthening predictive accuracy and understand the spatial distribution of ghost gear and entanglements in the Indian Ocean. To help us achieve this we put a call out to all signatory states in the Indian Ocean at the 8th Meeting of the Signatories to the IOSEA Marine Turtle MOU in Vietnam. The proposal will continue to develop and we will continue to encourage additional countries to contribute data. It is our hope that ghost gear events and turtle entanglements are better documented in the region so that the impact can be more accurately assessed.

-Dr. Martin Stelfox, ORP CEO and Founder

PUBLICATIONS - RESEARCH PAPERS

- Stelfox, M., Burian, A., Shanker, K., Rees, A.F., Jean, C., Willson, M.S., Manik, N.A. and Sweet, M., 2020. "Tracing the origin of olive ridley turtles entangled in ghost nets in the Maldives: A phylogeographic assessment of populations at risk". *Biological Conservation*, *245*, p.108499.

- Stelfox, M., Lett, C., Reid, G., Souch, G. and Sweet, M., 2020. "Minimum drift times infer trajectories of ghost nets found in the Maldives". *Marine Pollution Bulletin*, *154*, p.111037.

- Diogo Veríssimo, Sara Vieira, Domingas Monteiro, Joana Hancock, Ana Nuno "Audience research as a cornerstone of demand management interventions for illegal wildlife products: Demarketing sea turtle meat and eggs". Conservation Science and Practice (16 January 2020)

- Stelfox, M., Bulling, M. and Sweet, M., 2019. "Untangling the origin of ghost gear within the Maldivian archipelago and its impact on olive ridley (Lepidochelys olivacea) populations". *Endangered Species Research*, *40*, pp.309-320

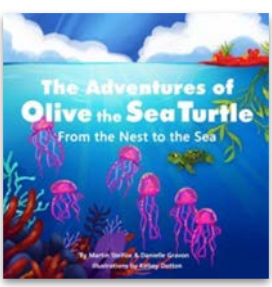
- Sweet, M; Stelfox, M. , and Lamb, J. (Authors) "Plastics and shallow coral reefs. Synthesis of the science for policy-makers". United Nations Environment Program (2019)

- Umaira Ahmed, Mariyam Shidha, Jillian Hudgins, Nashwa Manik, Enas Riyaz and Martin Stelfox in: Phillott, A.D., and Rees, A.F. (Eds.) (2019). Sea Turtles in the Middle East and South Asia Region: MTSG Annual Regional Report 2019. Report of the IUCN-SSC Marine Turtle Specialist Group, 2019

PUBLICATIONS - OTHERS

Sea Turtle Code of Conduct - a guide on how to behave around nesting, hatching and swimming sea turtles.
Graphic Design by Susie Gibson.

Finding an Entangled Sea Turtle - a step-by-step guide on what to do when you find an entangled sea turtle.
Graphic Design by Susie Gibson.



The Adventures of Olive The Sea Turtle: From the Nest to the Sea
By Martin Stelfox, Danielle Gravon, illustrations by Kelsey Dutton

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EDUCATION & OUTREACH

INTERNSHIP PROGRAM


Intern Karam Ibrahim Ali

BUILDING LOCAL CAPACITY

ORP's Internship Program for Maldivian nationals is critical in achieving our goal to build local capacity in the Maldives; there are currently no other veterinarian training facilities available in the country. The interns work at the Rescue Centre for a three-month period and play an integral part in the daily running of the Rescue Centre. They receive a stipend, food, and accommodations during the internship.

The interns are taught basic turtle medical care and husbandry and help educate both guests and the school groups that visit the Rescue Centre. Once their internship is complete, they become turtle ambassadors for the project and continue to spread awareness of the project's work and goals in the Maldives.

This year we hosted 4 interns, including the first government sponsored veterinary student in the Maldives, Karam Ibrahim Ali, a veterinary student at the University of Sydney, Australia. We have been able continue running the Marine Turtle Rescue Centre during the COVID-19 outbreak with the help of intern Eman Shareef, who agreed to extend her internship during these challenging times.

EDUCATIONAL OUTREACH INITIATIVES

KNOWLEDGE IS POWER

Education is a powerful tool to increase awareness, engage people – particularly young people – and stimulate action. Our goal is to educate school children, local communities, boat crews, divers, fishermen, tourists, resort staff, biologists, and anyone whose livelihoods rely on the Indian Ocean, about the damaging effect of ghost nets. Our interactive workshops, talks, lectures and field-trips include a wide range of topics. We cover everything from sea turtle biology and marine debris statistics to ghost gear facts and new legislation protecting sea turtles in the Indian Ocean or locally. We visit schools and local communities as well as tourist resorts. Turtle spotting snorkelling excursions and ghost net hunting boat trips are popular both with tourists and resort staff.

All of ORP's sea turtle biologists deliver weekly presentations to resort guests, guide turtle-focused snorkel trips and take part in "kids club activities". They also educate resort staff and visit local schools, aiming to establish a presence within the local communities.

In the past year we have visited a number of schools in Maldives, Pakistan, the UK, Slovakia, UAE and Oman and reached hundreds of school children. We also welcome schools to our Rescue and Rehabilitation Centres in the Maldives, both in person and virtually for schools overseas.

SCHOOL VISITS

In July 2019, ORP's Sea Turtle Biologist in Oman, Zoe Cox, held a Marine Biology Session at the Little Green Fingers Summer Camp at Dubai Mall, UAE. The children learnt about coral reefs, the lifecycle of turtles, and how difficult it is for the turtle hatchlings to make it to the ocean. There were activities such as turtle hatchling races and the children got to look at coral skeletons and turtle bones too!

In July 2019, Dr. Claire Petros visited Oakley Junior School in Basingstoke, UK, with Shawn and Laura Holmes, two of ORP's biggest fundraisers and ex-research expedition volunteers. After presenting the work of ORP to a full school assembly, they were shown some incredible artwork by the school children - all made out of recycled plastics -and entertained with original poetry about recycling and protecting our planet.

VISITING SCHOOLS

In November 2019, One & Only Reethi Rah and ORP invited Immaduddin School in Malé to take part in a new Marine Education Programme. 16 students between 8 and 15 years old visited the island and the new Turtle Rehabilitation Centre. The students met turtle patient Azura, learnt about the need to conserve marine life, played some games and finished the day with a snorkeling safari. For some, it was their first time ever snorkeling – or being in the water!

After ORP visited Beaconhouse IB Campus Clifton in Karachi in January 2020, 36 5th graders and 14 teachers and parents from the school visited Abdul Rehman Goth fishing community. They learned directly from the fishers about the nuisances caused by ghost gear and other forms of pollution, and how it affects their livelihood. Inspired after seeing our ghost net bracelets, they took ghost net back with them to make bracelets of their own design to sell at their school fair.

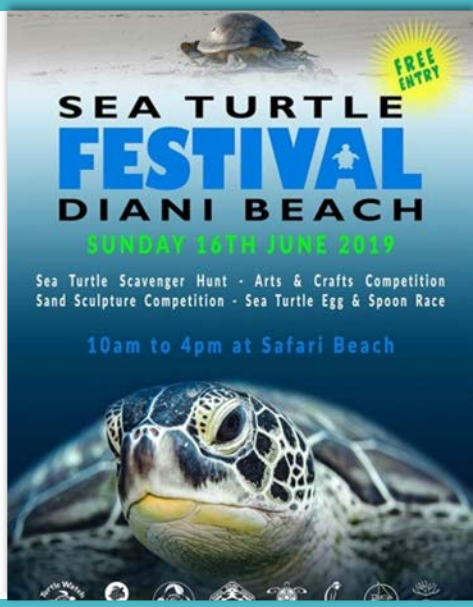
VAAVOSHI - BAA ATOLL'S FIRST EVER TURTLE FESTIVAL

Dr. Claire Lomas organised Vaavoshi Turtle Festival to bring together the islands and communities in Baa Atoll, environmentalists, and visitors from around Maldives to raise awareness of sea turtle conservation and celebrate our beautiful ocean. In all, 22 stalls participated. Each stall had a unique theme and activity, highlighting a different aspect of marine conservation. There were many varied games and activities for visitors to get involved in. In addition, there were artistic sand sculpture turtles demonstrating turtle nesting, recycled plastic displays and much more. Participants could also experience face painting and underwater virtual reality provied by Manta Trust! 8 schools from around Baa Atoll attended the event with over 200 students enjoying the festival. Olive ridley in the Dhivehi language is 'Vaavoshi' and inspired the name for the festival.

DIANI SEA TURTLE FESTIVAL

In June 2019, ORP was one of the main organizers and participants of the first Diani Sea Turtle Festival, run by the Marine Education Centre. The festival was a huge success with people joining from all along the coast, including 200 students from schools in Kwale. There were educational sessions, competitions, turtle games and sand sculpture making on the beach.

11 conservation organisations took part with the aim to raise awareness about sea turtles and how we can help them. ORP had a stall where visitors learnt about sea turtle foraging ecology, the importance of monitoring in-water sea turtle populations, and the impacts of ghost gear on sea turtles.



LAAMAFARU FESTIVAL

Laamafaru Festival is a joint venture between our partner resort, Six Senses Laamu, and the Laamu community. The MUI team, including ORP, was helped with the organisation. Launched as Laamu Turtle Festival in 2016, the festival was rebranded as Laamafaru Festival in 2019 with a broader scope to focus on the entire marine ecosystem.

In 2019, the festival drew an audience of 1,500, coming together to celebrate the importance of marine ecosystems and to raise awareness about the need to keep "Our Ocean, Safe and Protected". The festival had a fun-packed schedule of parades, stage performances, educational stalls and swim races. ORP spent the day teaching students about the threats to sea turtles.

GENERAL OBJECTIVES 2020 - 2021

1. Expand data collection in the Indian Ocean

- Expand our sea turtle photo ID programs through collaboration with additional individuals, divers, resorts and local NGOs to increase data collection in the Indian Ocean.
- Work with relevant signatories to the IOSEA to increase data collection on ghost gear and turtle entanglement events in the northern Indian Ocean.

2. Improve our understanding of sea turtle ecology in the Indian Ocean

- Assess green turtle feeding behaviour and diet composition.
- Identify major foraging habitats.
- Assess existing data gaps in sea turtle research and strive to fill these gaps in the Indian Ocean.

3. Provide the best possible care for injured sea turtles in the Indian Ocean

- Expand our rescue and rehabilitation facilities in the Maldives and the wider Indian Ocean.
- Utilise emerging evidence based veterinary medicine to ensure best veterinarian practices are implemented at our rescue centre and share these gold standard practices with other turtle rescue centres internationally.
- Continue our visiting veterinarian program and harness knowledge gained from these specialists.

4. Build capacity

- Build relationships with local NGOs, universities and local groups to help protect sea turtles and their habitats in the Indian Ocean.
- Continue to work with school groups to teach sea turtle ecology and threats.
- Expand our ghost gear circular economy project in Pakistan and replicate into other regions of the Indian Ocean.
- Design online learning tools to compliment national and international learning projects.

TOP DATA SUBMITTERS 2019-2020

We would like to thank all our data submitters for their support over the last year. Their contributions are invaluable!

- Manta Trust Laamu, Maldives: 600 sightings
- Carolina, Jess, Ida, & Alex from Coco Palm Bodu Hithi Resort, Maldives: 457 sightings
- Bekki from One & Only Reethi Rah, Maldives: 120 sightings
- Jess from Meeru Resort, Maldives: 94 sightings
- Denis Moser, Kenya: 84 sightings
- Fatma Manyenze, Kenya: 68 sightings
- Cami and Emilia from Milaidhoo, Maldives: 64 sightings
- Tay Belcher, Kenya: 54 sightings
- Prodivers Maldives: 58 sightings
- Tiffany & Lynn from Manta Trust Lhaviyani, Maldives: 57 sightings
- Ariana & Petra from Kihaad, Maldives: 41 sightings
- Jackie from Joali, Maldives: 34 sightings
- Fabien from Amilla Fushi Resort, Maldives: 33 sightings
- Mark Croft, Kenya: 21 sightings
- Ellie from Soneva Jani Resort, Maldives: 20 sightings

PARTNERS AND DONORS 2019-2020

We would like to express our sincere gratitude to all our partners, supporters, fundraisers, donors, adoptive parents, citizen scientists, volunteers and visiting vets! Thanks to your support over the years we have treated over 125 injured sea turtles and successfully released 66 back into the wild to date; we have recovered more than 10 tons of ghost gear from beaches and oceans and saved countless turtles and other animals from getting entangled; we have made big headways in our research into the origins of ghost gear; we have found inventive ways to reuse recovered ghost nets; we have educated thousands of school children, tourists, divers, fishers and resort employees; and we have identified more than 4,000 individual sea turtles in the Indian Ocean and documented tens of thousands of sea turtle sightings in our turtle population studies. We have only been able to do this thanks to your generosity and support.

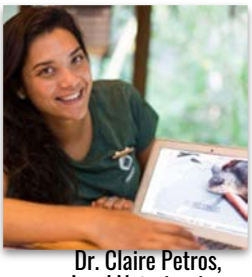
Thank you!

THE ORP TEAM 2019-2020

Dr. Martin Stelfox,
Founder & CEO

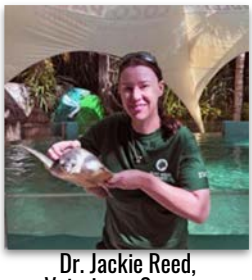
Dr Jillian Hugins,
Senior Project Scientist

IN THE MALDIVES



Dr. Claire Petros,
Lead Veterinarian

Shameel Ibrahim,
Project Coordinator



Dr. Jackie Reed,
Veterinary Surgeon

Dr. Claire Lomas,
Veterinary Surgeon

Laura Whiteley,
Sea Turtle Biologist

Jo Goodfellow,
Sea Turtle Biologist

Kristina Loosen,
Sea Turtle Biologist

Rosie Brown,
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IN OMAN

Zoe Cox,
Sea Turtle Biologist

Jane Lloyd,
Sea Turtle Biologist

IN PAKISTAN

Usman Iqbal,
Project Coordinator

Usman Iqbal,
Project Coordinator

Waqar J Khan,
Fashion Designer

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Rushan bin Abdul Rahman,
Researcher

Liz Nguyen,
Social Media Strategist

Susie Gibson,
Graphic Designer

AMBASSADORS

Andy Torbet,

Explorer & TV Presenter

Matt Sorum,
Rock 'n' Roll Legend

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