

BLUE & GREEN LAAMU


The Marine Conservation & Sustainability
Newsletter by the Maldives Underwater Initiative

AUGUST 2022

Captured by visiting photographer
Alex Mustard.



SIX SENSES
LAAMU



MUI

MALDIVES UNDERWATER INITIATIVE by Six Senses Laamu



This shot by Sascha Janson, was ranked in the top fifteen of last year's Six Senses Laamu's Underwater Photographer of the Year Competition.

WHAT'S INSIDE?

- 04 SIX SENSES CONSERVATION
- 08 THE MANTA TRUST
- 10 BLUE MARINE FOUNDATION
- 14 THE OLIVE RIDLEY PROJECT
- 18 OUR COMMUNITY
- 22 OUR HOME



THE BIG STUFF



129 megafauna surveys were conducted by the MUI and DBD teams



421 sharks were sighted



154 rays were sighted



215 turtles were sighted

OUR EDUCATION



1,476 moments of education were shared with guests



172 moments of education were shared with hosts



244 moments of education were shared with the community

SIX SENSES CONSERVATION

MUI REPRESENTS AT THE 4TH MALDIVES MARINE SCIENCE SYMPOSIUM 2022!

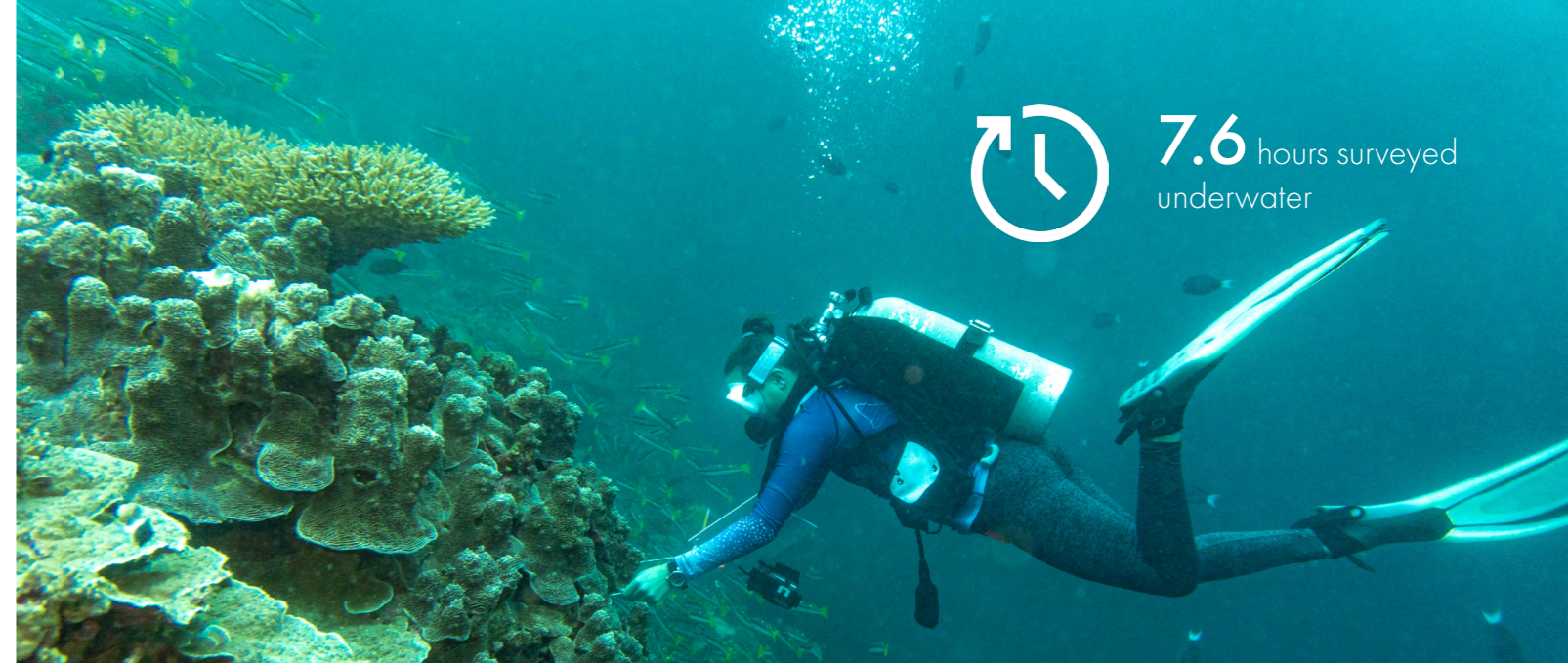
In 2016, the Maldives Marine Research Institute launched a bi-annual event, bringing together all marine researchers in Maldives to present their work, share and learn from each other. Eight years on, this has expanded into a 2-day event, with multiple national and international organizations presenting their research under multiple themes.

For the MUI team this wasn't only a chance to share their work and learn from other organizations, but an opportunity to reconnect with previous team members, who are now working on a variety of projects across the country. In total, MUI and partners presented 12 oral and poster presentations all of which represent the research and efforts in understanding Laamu's marine environment. This was the largest number from any one area, a testament to MUI's collaborative ethos, uniting expertise to have the farthest reaching impact.

Check out a number of sections in this issue to see what research was presented! 🌊



12 presentations
from MUI and
partners



7.6 hours surveyed
underwater

STARTING NEW RESEARCH CORAL RECRUITMENT

This August MUI is starting to collect data on a very exciting new research project: a coral recruitment study! For this purpose, MUI has been joined by our new intern Rhiannon, a PhD student from the University of Exeter, studying coral reefs in the Maldives.

Her project at MUI will look at coral larval settlement and reef replenishment in Laamu Atoll following the 2016 bleaching event where around 75% of coral cover was lost due to bleaching. Understanding the recruitment level of Laamu Atoll's reefs will help us understand if natural recovery is occurring on our reefs and the team will be able to get a baseline of recruitment in Laamu Atoll. Rhiannon will do this by conducting underwater surveys consisting of 20 quadrats at three different depths: 5m, 10m and 15m.

Her study will also look into differences in recruitment between different reef types such as inner reefs, outer reefs and channel reefs as well as the diverse human uses of the reef islands: inhabited, resort and uninhabited. The coral cover of each site will also be calculated, which can be an indication for coral reef health. She will then be able to compare this data to determine which reefs are having faster or slower recovery than others and if that is influenced by human use, depth, or reef type. Understanding the recruitment rates will help MUI identify areas of vulnerability and resilience, which can influence upcoming development projects at Six Senses and within Laamu Atoll and provide better protection for our reefs! 🌊



152 quadrats
analyzed so far

INTERNATIONAL WHALE SHARK DAY

30th August marks International Whale Shark Day, spotlighting this fascinating shark species. Not only is the whale shark the largest shark, but it's also the largest fish and has an average life span of 70 years! Despite their magnificence, whale sharks are endangered and require protection and effective conservation measures.

Here at Six Senses Laamu, we carried out multiple activities to celebrate and spread awareness about these gentle giants. Our skilled chefs served whale shark shaped pancakes in the morning at the breakfast buffet, and throughout the day the MUI team quizzed their online followers with whale shark questions and shared footage of past encounters of these creatures in Laamu.

The day was concluded with whale shark-themed cocktails at the weekly management cocktail party, where the MUI team set up a stall to further educate guests about whale sharks and their need for protection. Guests were also given the exciting opportunity to participate in an immersive VR experience and see a whale shark swim right by them!

That is not all, we had an ongoing whale shark naming contest during the party! The winning name was 'Nala Dhun Thari', meaning beautiful shooting star in the local Dhivehi language. This name was given to an unnamed whale shark sighted in Laamu previously. Welcome to the Laamu family Nala Dhun Thari! 🌟



Photo taken by Ibrahim Yameen, this memorable encounter was taken at Fushi Kandu towards the end of the dive.



1 new Whaleshark
named in the national
database

PRESENTING CORAL SPAWNING RESEARCH

Six Senses Laamu is proud to have presented their results on coral reproductive patterns in Laamu Atoll at this year's Maldives Marine Science Symposium (MMSS). The research project was designed to investigate the reproductive patterns of tagged and monitored colonies on the house reef of Six Senses Laamu to develop a baseline understanding of coral reproductive cycles in Laamu Atoll.

Coral reefs around the world are suffering from an ever-increasing array of threats such as climate change, pollution, and habitat destruction. Maldives' coral reefs have suffered multiple mass bleaching events as a result of increased water temperatures, highlighting that this nation is at the fore front of climate change. The natural recovery of reefs from such disturbances relies on the successful spawning, fertilisation and settlement of gametes produced by surviving coral colonies. Broadcast spawning, whereby male and female gametes are released into the water by multiple colonies of the same species, often occurs only once a year and little is known about these events in the Maldives in comparison to other major reef systems, such as the Great Barrier Reef in Australia. MUI wanted to change this and started in-depth surveys researching the spawning patterns of 24 individual *Acropora* coral colonies.

Captured by Greg Holder



72 underwater surveys conducted



96 hours spent surveying



75% of tagged coral colonies were recorded spawning



7 spawning months per year

Spawning of 18 (75%) of the monitored colonies was recorded during 96 hours of survey dives over an 18 month period. Multiple other colonies of several species from 8 different genera that were not consistently monitored for egg development were observed spawning, providing additional important information on the variety of spawning cycles for various species and genera.

In 2021, spawning of various species was recorded for the months of April, June, October, November, and December. In 2022 spawning was observed in January, February, March, and April. This illustrates that, contrary to previous assumptions, which were that spawning in the Maldives happens in March and November only,

coral spawning, at least in Laamu, happens across October to April, and June with a particular mass spawning event of multiple species recorded in January and November.

Six Senses Laamu's observations make up the first consistent monitoring database of the sexual reproduction of corals in Laamu Atoll, highlighting the potential for natural reef replenishment and recovery. The team is incredibly excited about these first results and observations will continue with the aim of incorporating additional genera and assessing coral recruitment, the other coral research project MUI has just launched with Exeter PhD student Rhiannon, as seen in the article on the previous page. [🌊](#)



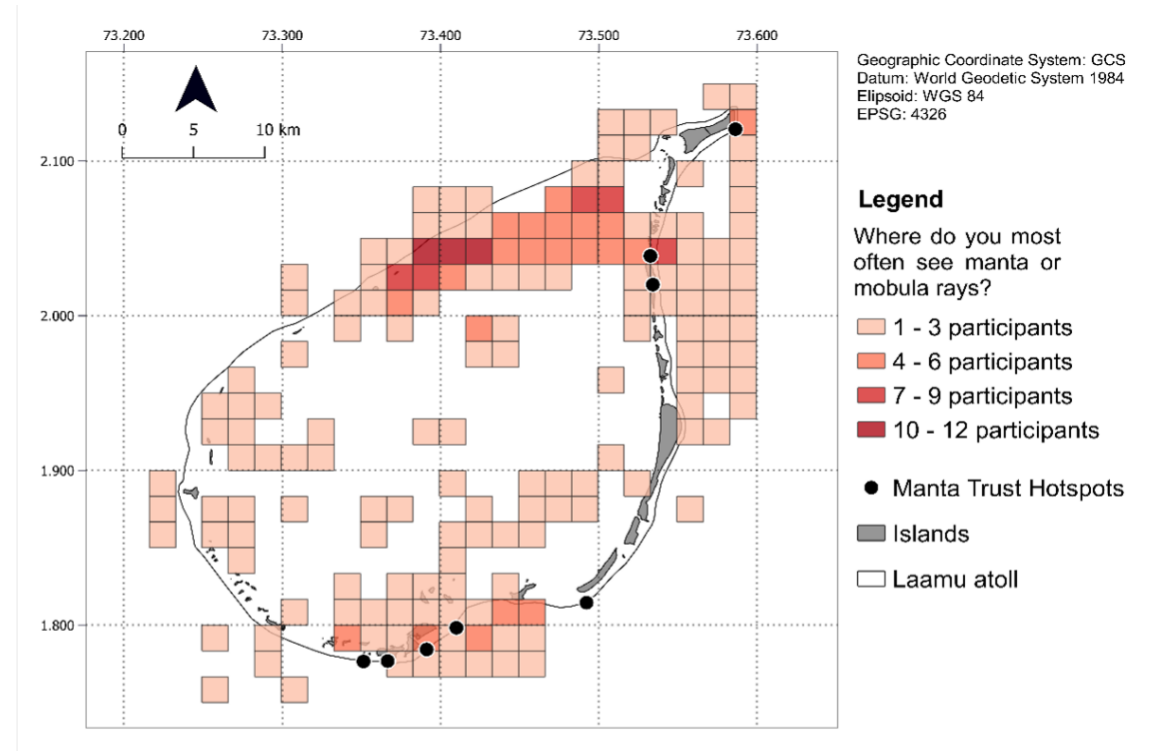
THE MANTA TRUST



LOCAL ECOLOGICAL KNOWLEDGE SURVEY RESULTS

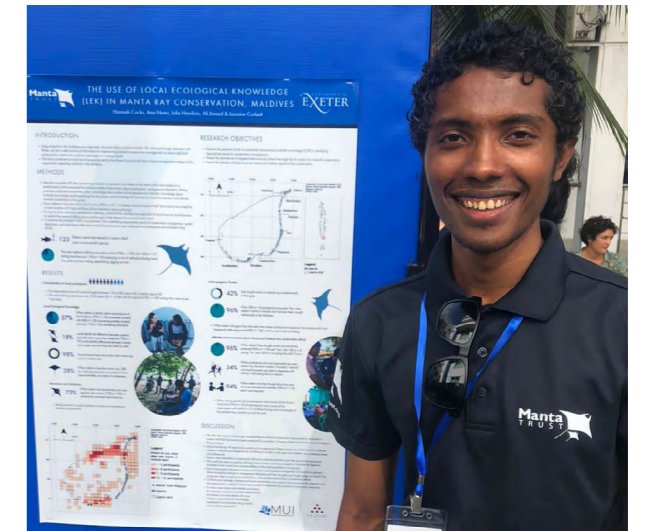
The Manta Trust Laamu team were excited to present the results of the local ecological knowledge (LEK) surveys conducted in Laamu this year at the 4th Maldives Marine Science Symposium, in a poster presentation. The event was a great opportunity for the team to publicise this research and discuss the potential for this project in other areas in the Maldives, with marine scientists at the event. They were also delighted to meet other members of the Manta Trust. As part of the study, 123 fishers were interviewed through a questionnaire which examined information about participants, including fishing practices employed, knowledge about native marine species and mobulids, knowledge about mobulid threats, and knowledge of measures for mobulid protection and attitudes towards conservation of the group. Some of standout results include:

- 98% of participants have had contact with manta rays and/or mobula rays.
- 42% of fishers had caught manta or mobula rays unintentionally in their gear. However, only 2% of participants answered 'Yes' when asked if manta or mobula rays had ever been caught intentionally in the Maldives.
- When asked if they thought manta rays should be protected 96% said 'Yes'.
- When participants who had responded yes were asked why, the word 'tourism'/'tourist(s)'/ 'visitor(s)' was most frequently recorded in responses with 34% stating this as a reason.
- When asked what they thought about the work of conservationists and scientists, 94% said it was important.



In the heatmap shown – the squares highlighted in red represent areas where fishers have seen the highest number of manta and mobula rays, many of which overlap recently designated marine protected areas in Laamu atoll. The black dots represent the manta ray hotspots identified by the Manta Trust, which highlights how crucial LEK is in identifying megafauna distribution, in regions where research and tourism is limited.

The LEK discovered in this survey, has identified areas of conservation importance for mobulids in Laamu atoll that have recently been proposed for protection. Fishers were interested in conservation efforts for mobulids primarily due their economic importance, which could be useful in working with local communities to enforce protection. Collaboration between scientists and local communities was crucial to the success of this research and has emphasized a need for local empowerment in implementing successful conservation measures. This study was conducted as a masters thesis project at the University of Exeter, by Hannah Cocks, who the Manta Trust Laamu would like to thank for her involvement and look forward to reading the published report in September 2022!



 1 poster presented at Maldivian Marine Science Symposium



TAM'S VISIT TO SIX SENSES LAAMU

The team were thrilled to welcome Tam Sawers, Maldives project leader for the Maldivian Manta Ray Project, to Six Senses Laamu this month. Tam has been overseeing all the projects in the Maldives for many years but has not been able to visit Laamu for a while due to Covid restrictions.

So, it was great to show Tam the research currently being conducted in Laamu in person, and to be able to host discussions and plan annual goals with the resort managers. The team even managed to take Tam to three of their main underwater research locations - Fushi Kanduu, Hithadhoo Corner, and Boduhuraa Beyru, all of which have awesome manta ray cleaning stations...a few of Laamu's resident manta rays showed up to show off and give Tam a proper welcome! 🌿



FUSHI FRIDAYS BEGIN!


The Deep Blue Divers and Manta Trust team have collaborated to promote a weekly dive event at the resort...Fushi Kanduu Fridays! Fushi Kanduu is a beautiful dive site in the northeast of the atoll, that hosts an active manta ray cleaning station, and was recently designated as a marine protected area. Although it is one of Manta Trust's main research locations, it is quite far from the resort and harder to access than other manta ray sites, such as Hithadhoo Corner.

To ensure that the Manta Trust can conduct regular "Eyes on the reef" timelapse camera deployments at the site, the resort dive boat will visit Fushi Kanduu once a week.


Like all manta ray dives at the resort, the boat will be accompanied by a Manta Trust staff member, who will educate guests about Laamu's manta rays, ensure that the dives follow the Manta Trust's code of conduct for diving with manta rays, and provide photographs and information about the manta rays encountered. The data collected from the site will form part of a long-term study investigating the seasonality and movements of manta rays in the atoll. The team are super excited to visit this site more regularly and collect important data on Fushi Kanduu's mantas! 🌿



Taken by Jasmine Corbett



38 manta rays encountered



9 manta rays measured

MANTA OF THE MONTH



2 Stereo Video Photogrammetry units calibrated

On the first Fushi Friday event, the Manta Trust were thrilled to encounter one of Laamu's newest manta rays – MV-MA-5161 "Jermaya", a subadult male, who was first encountered at Fushi Kanduu at the end of 2021. He came to check out the divers and swim alongside them on their safety stop at the end of the dive.



12 EOTR deployments with 355 hours recording analysed

When he was first encountered, he displayed predatory bites on his pectoral fin, but these appear to be healing nicely. He has only been seen four times since his initial sighting, three of which were at Fushi Kanduu, suggesting that he has preference for this site. There are a few individuals that only frequent this location in the northeast of the atoll, reiterating the importance of visiting this site as regularly as possible, to form a clearer understanding of the atoll's unique population of manta rays. 🌿



BLUE MARINE FOUNDATION

LAAMASEELU MASVERIYAA FISHER RECRUITMENT

This month, Blue Marine Foundation (Blue Marine) and Maldives Resilient Reefs (MRR) recruited nine new fishers into the Laamaseelu Masveriyaa program from local islands. The team visited the islands of Fonadhoo and Maamendhoo, where the fishers were introduced to the program's code of conduct. The code of conduct stipulates multiple criteria such as scientifically informed minimum size limits for fish species, types of sustainable low-impact fishing gear, avoidance of marine protected areas and protected species.



The team are excited to work with this new cohort of Laamaseelu Masveriyaa fishers, with each recruit helping the program increase the transparency and traceability of resort fishing activity on Laamu Atoll.



9 new fishers join the program



MMSS PRESENTATIONS!

108 fish sustainably sold to Six Senses Laamu

This month, the Blue Marine/MRR presented six presentations at the Maldives Marine Science Symposium 2022. The presentations covered the teams work on benthic and fish assemblage health around Laamu, as well as the atoll-wide resource-use surveys conducted last year and the gleaning surveys across two of Laamu's inhabited islands. Furthermore, Jake and Afaaz presented their work on ensuring sustainable resort coral reef fisheries on Laamu. Their presentation covered two major aspects of their work: 1) the development of the Laamaseelu Masveriyaa program as the Maldives's first sustainable resort reef fisheries model; and 2) the creation of a baseline understanding of tourist recreational fishing activity.

resilience to future climatic change. The presentation was very well received by symposium audience members, with many participants who work in the resort sector indicating a desire to incorporate Blue Marine/ MRR's research into their tourism operation. The team will be building upon the impetus generated by this presentation with a seafood sourcing survey of all tourism operators in the Maldives later this year. This work will inform the roll-out of the Laamaseelu Masveriyaa program and elucidate the receptivity of operators to sustainable seafood sourcing processes.

This work carries national significance for resorts across the Maldives and will help develop science-based fisheries management frameworks to ensure that the resort reef fisheries sector does not undermine coral reef

6 national-level presentations





GROUPERS SPAWNING SURVEYS

Later this year, Blue Marine and MRR are planning to restart their grouper spawning surveys. Surveys are planned to be conducted around the new moon across the upcoming months of October, November, and December. Like other reef fish, groupers are known to aggregate in large numbers to broadcast spawn, this is when many individuals migrate to the same place to reproduce all at the same time, by participating in courtship 'dances' and then releasing eggs and sperm into the water. Mass grouper broadcast spawning aggregations have been recorded across the globe, with these impressive natural phenomena providing a reliable buffet for a variety of marine predators.



2 practice survey dives



13 guest fishing trips surveyed



However, grouper aggregations have not gone unnoticed by fishers, with overexploitation of spawning aggregations resulting in many species now being found on the IUCN Red List of Threatened Species. Groupers are protogynous hermaphrodites, meaning they change sex from female to male as they grow. Exploitation of grouper aggregations has historically targeted large male individuals, as these species provide fishers the most profit when sold to overseas markets. This has resulted in Maldivian grouper populations being 'skewed', with an unnaturally large number of females as compared to males, causing problems for their populations to reproduce and recover from exploitation.

The team will replicate surveys conducted in 2016 and 2017 to assess how Laamu's grouper spawning aggregations have changed over the past half-decade. On the research dives, the team will be focusing on four species of grouper, which are all confirmed broadcast spawners. This will involve recording the number of individuals from each species, alongside any spawning



behaviour (i.e. biting, chasing and rubbing together) for 8 days over the new moon period.

To prepare for the surveys, the team recently conducted a number of practice dives across the August new moon. This involved practicing grouper species identification, as well as getting a grips with dive site navigation and how to identify characteristic spawning behaviours. Findings from these surveys will support the effective protection of Laamu's grouper spawning sites into the future. 🌊





**OLIVE RIDLEY
PROJECT**

THE OLIVE RIDLEY PROJECT

NEST EXCAVATIONS BEGIN!

After being affected by the storm sea surges in July, many of the sea turtle nests at Six Senses Laamu were flooded and were unlikely to provide suitable conditions for the successful development of eggs. Although it was a long wait for us to wait till the end of the incubation period, after 70 days the nests laid during this period were excavated for research purposes with a special permit from EPA.

Nest excavations help us understand:

- The depth of the nest
- Total number of eggs laid
- How many hatchlings came out of the eggs
- What happened to the eggs that did not hatch
- Unusual findings such as malformation in hatchlings
- Causes of unsuccessful hatching

The team offer the excavations as a guest experience, as this gives guests the opportunity to learn more about turtle biology and see first-hand the challenges and sometimes more graphic side of sea turtle research. Guests who sign up to witness nest excavations are briefed about what they are expected to see and the importance of doing an excavation. It's a unique educational experience that gives a 'behind the scenes' view of turtle hatching.

Once all the necessary data is collected, all the eggs are put back into the nest and re-buried. It is important to do so as the eggshells and undeveloped eggs will fertilize the beach and improve the growth of the vegetation on the beach, as part of the natural ecosystem. 🌿



 **20** guests
attended excavations

 **3** nests excavated

TURTLES ALL THE WAY DOWN: ORP PRESENTS AT MMSS

The Olive Ridley Project presented at the Maldives Marine Research Symposium this month, with three of the presentations highlighting contributions from Laamu! First up, ORP's Senior Project Scientist Dr. Stephanie Köhnik presented the findings on the first national Red List Assessment of Marine Reptiles, where green sea turtles were classified as endangered and the hawksbills were classified as critically endangered. The paper included population data collected by Six Senses's biologists, divers, and guests, and also noted Laamu as one of the hotspots for green sea turtle sightings!

Emily Mundy, ORP's Sea Turtle Biologist at Lhaviyani presented preliminary findings from the first socio-economic valuation of sea turtles in the tourism sector in the country, with contributions from Deep Blue Divers. The paper found that sea turtles were amongst the top two requested species amongst snorkelers and divers.

Isha Afeef, Laamu's former Sea Turtle Biologist presented a summary of nesting research in Maldives from 2018-2021, with a special focus on nesting seasons in Lhaviyani



and Laamu. Olhveli island where Six Senses is located is one of the two sites that has been consistently monitored long-term by the ORP. The findings from the research shows that nesting happens year-around across the country, with different nesting patterns in different atolls. The paper will be published next year. 🌿

Photo taken at Gaadhoo, the most significant green sea turtle nesting beach in the Maldives. The inhabited island is key in ensuring the survival of green sea turtles in the Maldives.





TURTLE ON SPOTLIGHT, AMBER

 **3** nests laid

Amber HK4835

Amber is a juvenile hawksbill who was first sighted in 2021. They were spotted foraging on some sponges in one of our beautiful dive sites on the north east side of Laamu atoll. After seeing Amber in 2021, they were never re-sighted for almost a year. We are so excited to see Amber again.

The team loves encountering the same turtles over and over, this is a great way to understand their growth over the time. ORP's turtle research also includes understanding sea turtle populations in Laamu. Individual turtles can be identified by their unique face scales. ORP practices a very non-invasive method of data collection for this research. The turtle's face scales on both sides of its face are photographed while following the ORP's code of conduct for swimming with turtles. This is how we know Amber and all the other 736 individual turtles that are identified in Laamu atoll.

Anyone can be a citizen scientist! Send your beautiful clear photographs of turtles to the Sea Turtle Biologist, along with the date and location where the turtle was seen. 🌊



APPRECIATING OCEAN HEROES

Ghost nets are discarded fishing gears that entangle marine life whilst floating around the ocean, including turtles. Six Senses Laamu boat captains and crews are trained and well aware about the damage ghost nets can cause, in addition to trapping live animals, they also get snagged on the reef and can break down into smaller pieces, which can sometimes be eaten by marine life.

Olive Ridley Project's research includes collecting data on ghost gears. The MUI team appreciates the assistance from the captains and boat crews of Six Senses Laamu to retrieve ghost gears and bring it back to the island where it gets discarded safely. This month, Six Senses Laamu's boat crews retrieved two nets from the ocean, preventing these potentially causing negative impacts and safeguarding Laamu's reefs. 🌊



 **2** ghost gears retrieved

 **5** new turtles identified in Laamu



Teaching a little VIP about turtle hatchings.

OUR COMMUNITY

THE SECOND EKU EKY MEETING OF 2022

In August, stakeholders and community leaders gathered for the second Eku Eky quarterly meeting of 2022. Eku Eky, meaning 'together' in the local language Dhivehi, brings together community leaders from all 11 inhabited islands to represent the atoll's 18,500+ residents. The meeting was attended by 33 members representing 33 organizations in the atoll.

During the meeting, the MUI team presented their project updates and discussed upcoming events, including Laamafaru Festival, Laamu's annual marine-themed festival meaning 'Laamu's reef festival'. Also discussed was an upcoming swimming instructor course for Laamu's women.



The meeting provided a crucial opportunity to gain community feedback on MUI and Six Senses Laamu's projects and helped identify ways to work together.

In the afternoon, the meeting attendees joined a sustainability tour at the resort with Six Senses Laamu Sustainability and Community Outreach Manager, which included lemongrass soap making, recycled paper making, and a tour of the organic garden and dive center. 🌿



 **33** members joined Eku Eky



ISDHOO' WATER FOR ALL' PROJECT

The Six Senses Laamu team welcomed the island council members of Isdhoo, the northernmost island of Laamu atoll, to Six Senses Laamu to inaugurate the first 'Water for All' project of 2022. During the visit, Six Senses Laamu signed the Memorandum of Understanding (MOU) with Isdhoo island council and Bahaaru private limited to donate 7 KENT brand water filters to Isdhoo island. In addition, the team and partner NGOs presented project updates and organized a sustainability tour to share the sustainable and conservation initiatives of the team.resort. With the new 'Water for All' project, seven7 water filters will be installed in Isdhoo Preschool, Council office, Isdhoo Health Center, Isdhoo Road Development Corporation office, and three3 mosques.

The 'Water for All' project is aimed to provide clean drinking water and reduce single-use plastics in the community. Funded by the Six Senses Laamu's sustainability fund, 97 water filtration units have been donated to the community since 2018. As a result, a significant number of single-use plastics have been eliminated, and a vast portion of Laamu's community has easy access to clean drinking water. 🌊



 **7** water filters donated

 **1398** people have access to clean drinking water



IMPROVING HEALTH CARE

Six Senses Laamu donated an I-STAT Machine (in vitro whole-blood analyzer) and cartridges to the Hithadhoo health center, the central health post for three neighboring islands.

The I-STAT Machine is an advanced, easy-to-use, portable instrument that uses cartridges to deliver real-time, lab-quality results. For Hithadhoo Health Center, this machine will improve the service provided to patients, enhance the competency of the healthcare workers, enable reliable diagnosis, and efficiently identify and direct cases to critical care when needed. In doing so, the I-STAT Machine will reduce in-healthcare mortality by detecting potential issues at the point of care and avoiding delays in critical care scenarios. 🌊



 **3465** people have access to new medical equipment

This donation is made possible thanks to the Six Senses Laamu Sustainability Fund, which has significantly improved the medical care provided to 3465 residents of Laamu Hithadhoo, Maamendhoo, and Kunahandhoo.




OUR HOME

MEET LAISHA, EARTH LAB INTERN

Earth Lab team is delighted to welcome Laisha, the newly joined Earth Lab intern. After completing her education from Laamu Kunahandhoo School, Laisha is eager to explore the opportunities in hospitality industry.

Laisha's interest in sustainable tourism first grew when she got the chance to take part in "Hello Hallu" the marine education program by MUI. She also participated in the Laamafaru Festival in 2017 and 2019 and visited Six Senses Laamu to learn more about its sustainable tourism. Now, Laisha is keen to be a part of its sustainable operations and to inspire other fellow community members through her 6 months internship program with Earth Lab. 🌿



 **42,941** KWH of renewable energy was produced

 **271** eggs were produced

 **20,349** Six Senses Water bottles produced

 **382** kgs of herbs were produced

To learn more about marine conservation and sustainability initiatives at Six Senses Laamu please contact:

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To stay up to date with the latest news, events and visiting experts follow the Maldives Underwater Initiative and Six Senses Laamu on social media

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