

BLUE & GREEN LAAMU

*The Marine Conservation & Sustainability
Newsletter by the Maldives Underwater Initiative*
OCTOBER 2023

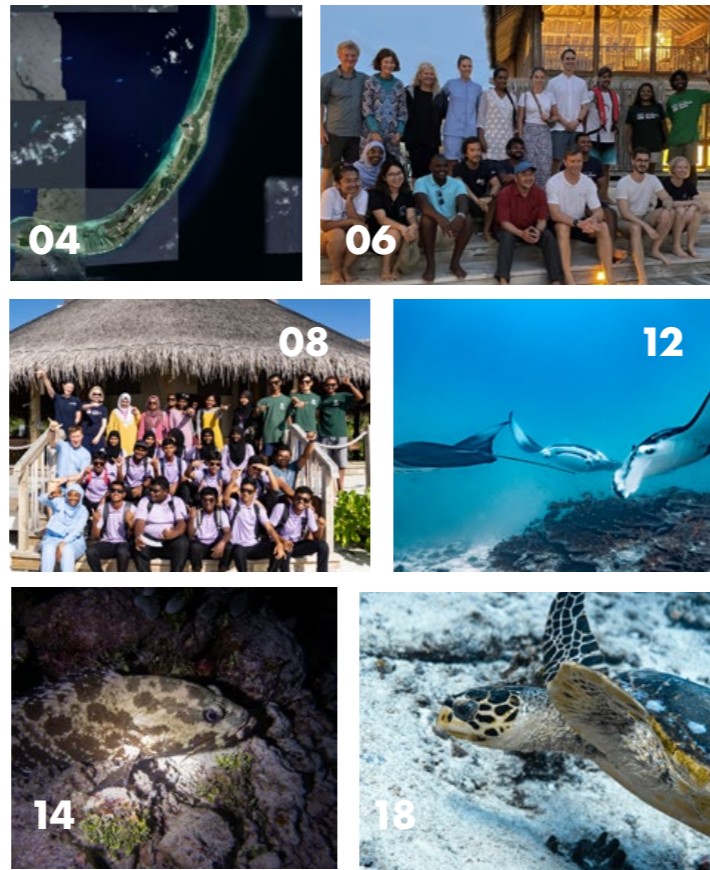


MALDIVES UNDERWATER INITIATIVE by Six Senses Laamu

© Miriam Staiger

WHAT'S INSIDE?




- 04 SIX SENSES CONSERVATION
- 06 OUR COMMUNITY
- 12 THE MANTA TRUST
- 16 BLUE MARINE FOUNDATION
- 18 THE OLIVE RIDLEY PROJECT
- 20 OUR HOME



THE BIG STUFF

-  **220** sharks were sighted
-  **148** rays were sighted
-  **169** turtles were sighted
-  **262** Guests joined on megafauna surveys

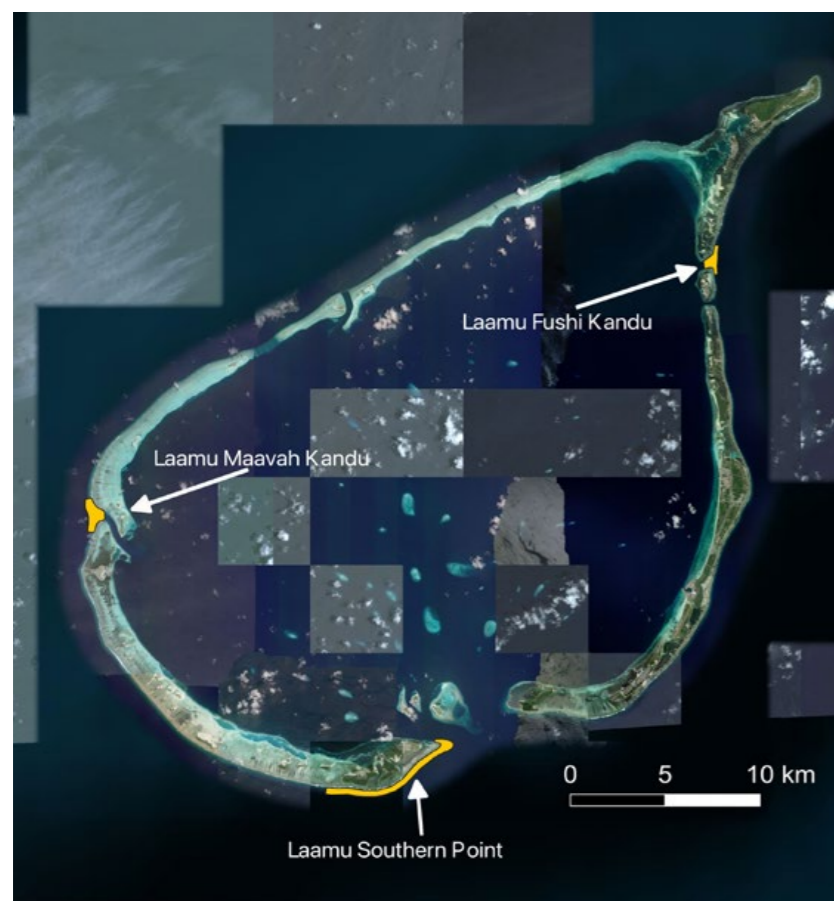
OUR EDUCATION

-  **1679** moments of education were shared with guests
-  **152** moments of education were shared with hosts
-  **202** moments of education were shared with the community



SIX SENSES CONSERVATION

CELEBRATING OUR NEWLY DESIGNATED IMPORTANT SHARK AND RAY AREAS!



The MUI team's efforts to go through an extensive application process for Important Shark and Ray Areas (ISRAs) has paid off! Three ISRAs in Laamu have been approved and the team is thrilled, a big thank you to everyone who helped the process and contributed knowledge and evidence! The Manta Trust is grateful for the opportunity of having collected data in Laamu Atoll for nearly a decade now, and it's showing that this kind of long term data is vital to support proposals like this.

The three areas with successfully allocated ISRAs are Laamu Southern Point, Maavah Kandu and Fushi Kandu. Each of these three sites has a unique set of characteristics that makes it vital for the health and survival of sharks and rays in Laamu.

Laamu Southern Point

Laamu Southern Point encompasses the southernmost region of Laamu Atoll, including some of the team's favorite dive spots. This area meets several of the ISRA selection criteria, is a reproductive area, a feeding area, an area of undefined aggregations, and an area which displays distinctiveness in species behaviors. Reef Manta Rays use this area to keep healthy during their pregnancy by visiting cleaning stations, it also has the second highest number of observations for courtship in the whole of the Maldives! This area is extra special for Mantas as when we are lucky enough to spot Mantas feeding in Laamu, 46% of them are within this area. In addition to the Manta



Rays, this area is also important for Grey Reef Sharks as undefined aggregations of this species are also seen within this area, possibly to feed or rest. The final criteria that this area meets is distinctiveness, it is both Grey Reef Sharks and Silvertip Sharks that fit this criteria as they can be observed displaying cleaning behavior, which is especially relevant as it is one of only a few known cleaning stations for these species within the Western Indian Ocean! Each of the qualifying species that uses this area for its survival is also considered vulnerable by the IUCN, emphasizing the importance of identifying areas vital for their survival. In addition, there are 11 supporting species - 10 of which are also considered vulnerable!

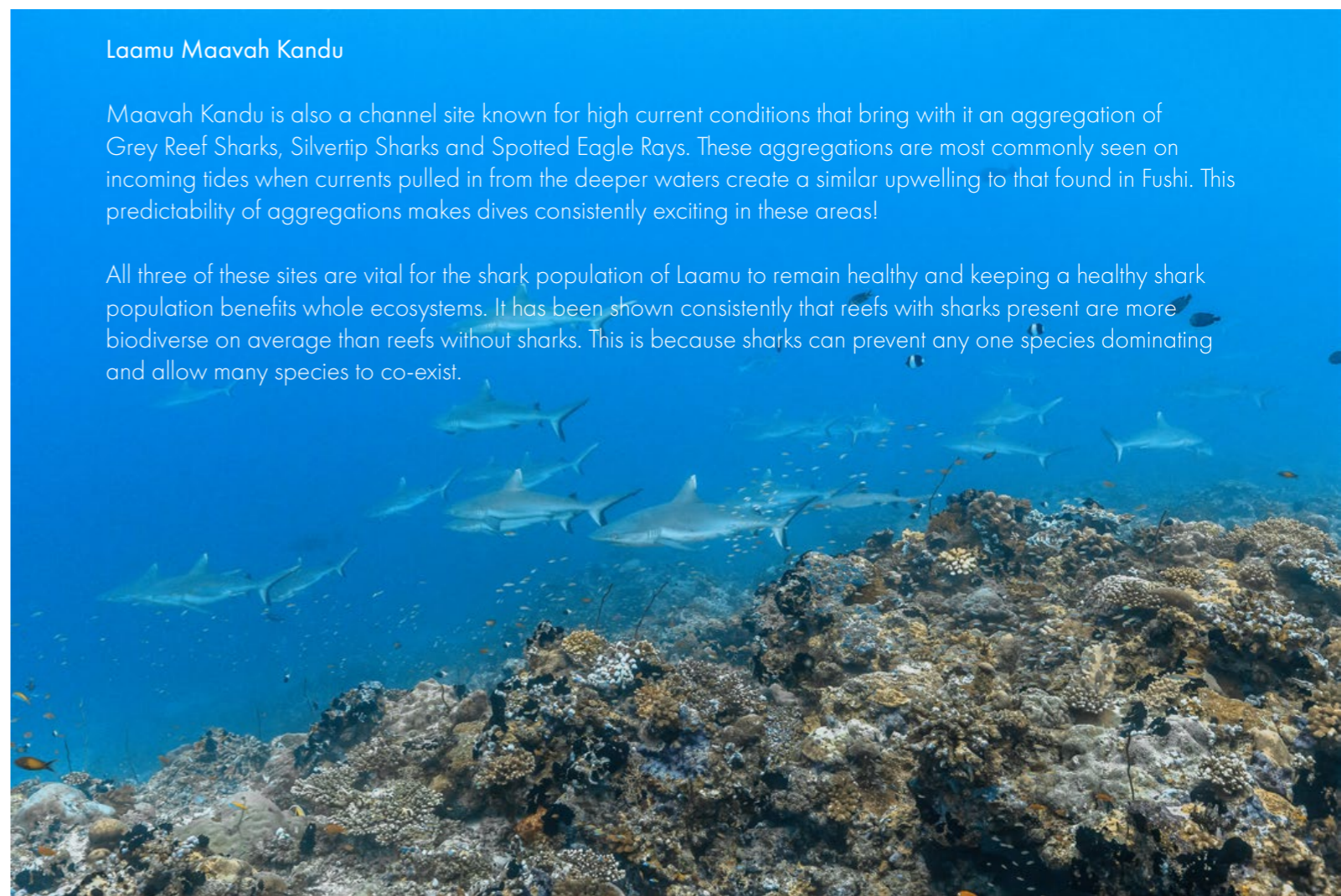
Laamu Fushi Kandu


Fushi Kandu is a channel site in the North East of Laamu Atoll which is also an important area for Reef Manta Ray reproduction, with both pregnant females and courtship observed here. Incoming tides through this channel create an environment in which undefined aggregations of both Grey Reef Sharks and Spotted Eagle Rays gather, the reason for this aggregation is not yet fully known but may be linked to the upwelling that allows the negatively buoyant species to rest.

Laamu Maavah Kandu

Maavah Kandu is also a channel site known for high current conditions that bring with it an aggregation of Grey Reef Sharks, Silvertip Sharks and Spotted Eagle Rays. These aggregations are most commonly seen on incoming tides when currents pulled in from the deeper waters create a similar upwelling to that found in Fushi. This predictability of aggregations makes dives consistently exciting in these areas!

All three of these sites are vital for the shark population of Laamu to remain healthy and keeping a healthy shark population benefits whole ecosystems. It has been shown consistently that reefs with sharks present are more biodiverse on average than reefs without sharks. This is because sharks can prevent any one species dominating and allow many species to co-exist.



 **3** important shark and ray areas approved

 **4** Qualifying Species

 **11** Supporting Species

MUI WELCOMES OCEAN LEADERS FROM AROUND THE WORLD

JUNIOR MARINE BIOLOGY EXPERTS RETURN






This month, the MUI team was lucky enough to have been visited by a very inspiring group of Ocean Leaders. Edinburgh Ocean Leaders is a programme to support ocean leaders from around the world, helping to coach leadership, mentoring and networking at large conferences. The aim of the programme is to accelerate the influence and reach of specific individuals in order to magnify the exceptional work being undertaken by them. The visit was filled with knowledge sharing and discussions around the role that tourism can play in marine conservation.

The MUI team was very interested to gain an insight into the development of Marine Protected Areas in other areas around the world and learn more about the work of each of the Ocean Leaders. It was incredibly inspiring to see such passion around marine conservation and admirable complex problem solving abilities. The team hopes that this meeting will be the start of something and that the Edinburgh Ocean Leaders programme continues to support extraordinary people in this way for the benefit of the health of marine ecosystems around the world.

The month of October brings with it school half term for many countries. This time usually brings back many previous Junior Marine biologists to continue their journey with the MUI team! This month the MUI team was lucky enough to not only have 10 new Junior Marine Biologists join the team but we also welcomed back 7 Junior Marine Biologists from previous trips, this group of loyal team members have visited many times and have done over 80 JMB sessions between them! These students have all shown amazing passion, knowledge and inspiration each time they visit.



-  **10** new students to JMB
-  **7** returning JMB students
-  **11** JMB sessions taken

OUR COMMUNITY

HELLO HALLU MAKES A SPLASH AROUND LAAMU AOLL



The MUI team has successfully concluded its Hello Hallu initiative, having engaged a total of 237 participants, including students, teachers, and parents from various islands within Laamu Atoll. This endeavor allowed us to connect with communities across each of the 11 inhabited islands. Throughout Hello Hallu, the primary goal was to inspire and motivate students to become more actively involved in preserving their local ecosystems.

During the sessions and afterwards, It was eye-opening to learn more about the local communities and their relationship with the marine life aroundon their own local islands. It was equally heartwarming to hear the strong enthusiasm from the students as well as the teachers to continue being involved in these sessions in the future. Looking ahead, the MUI team aspires to improve and develop the Hello Hallu sessions to cater to a wider range of audiences in the future.



The MUI team took great pride in welcoming the many eager participants from local schools, and it was clear that this experience had a positive and meaningful impact on their perspectives of the marine ecosystems around them. Below are some of the quotes collected from the post-surveys conducted to illustrate this impact.

What are you going to do to protect the marine ecosystem and megafauna found in Laamu Atoll?

“Participate in programmes that are conducted to protect the marine life”

“Avoid throwing plastics in the sea. Try to give awareness to those who don't know the importance of these”

“Reduce how much plastic that me and my family use”

What did you think about seagrass habitats before Hello Hallu and how do you feel about them now?

“I thought seagrass is dangerous and now i know how important it is for marine life”

“At first I thought seagrass was dangerous but now I know they help us to protect lands”

“Before I thought that just a scary grass in sea, now i know it isnt scary or dangerous and it is very helpful”

Do you believe that coral reefs and seagrass habitats are worth protecting, why?

“Yes, because we need coral reefs and seagrass habitats to help us to protect our island by reducing the force of the waves and more”

“Yes, they play vital role in maintaining the life in the marine ecosystem”

“Yes. It plays an unbelievably important role in the ecosystem and has made me realize how lucky we are to have all this”

THE MANTA TRUST



2 Master Students finish with Distinction

5 new mantas identified

NEW MANTA IN THE HOUSE (REEF)!

This month, some of our lucky Junior Marine Biologist (JMB) had an unforgettable encounter with a beautiful reef manta ray. During one of their exploratory snorkels around the house reef, they were surprised by a reef manta ray feeding in the surface waters. Seeing a manta ray on the house reef happens maybe once a year and is a truly special event. To make this encounter even more special though, is that this manta was able to be identified as a manta called Annie Vee. She is a beautiful female manta ray that has never before been seen in Laamu, and in fact, it was only

her second sighting ever after she was first identified in 2016 in an Atoll further North called Vattaru Atoll!

The Manta Trust team is always excited about sightings like this, as we really don't know where mantas like Annie Vee are spending most of their time. In 7 years, no one has ever taken a picture of Annie Vee - until now! The team will keep an eye out for her, but it's possible that she has just been following the plankton masses and has already moved on from here. But who knows?

1 new manta re-sighted after 7 years

1 manta feeding on the house reef



CLEANING STATIONS ARE BIODIVERSITY HOTSPOTS!

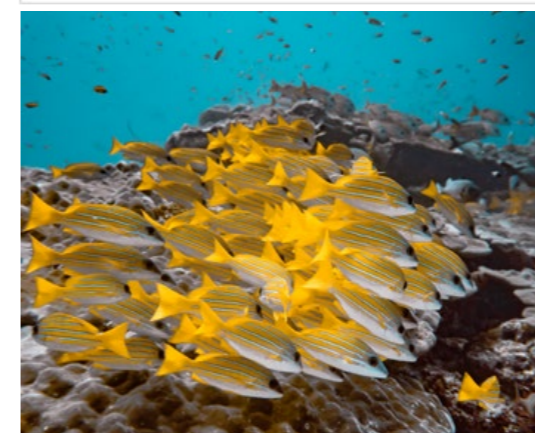
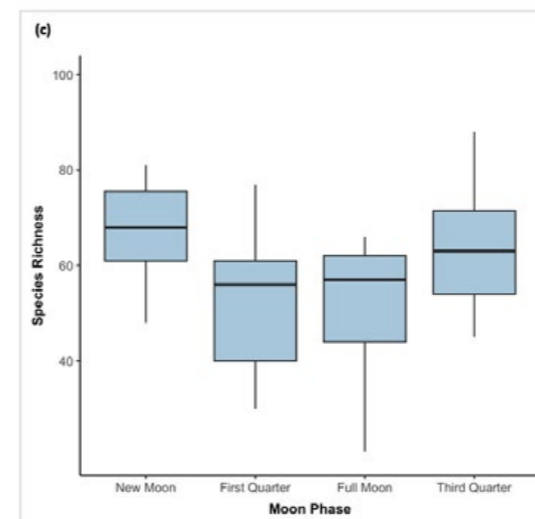
The Manta Trust team is excited to share the results from two of our Exeter University Master students who conducted their research projects with us throughout 2023! Both students received distinction for their work and the team would like to congratulate them on their hard efforts!

Tessa McCormack worked remotely with the Manta Trust to study the species diversity and ecological role of cleaning stations in Laamu Atoll. She used data collected by Remote Underwater Video surveys (RUVs) to investigate how different factors, such as habitat complexity and moon phase, affect the types of interactions occurring across these sites. A total

of 153 species from 33 families and 14 orders were identified. We found evidence of habitat complexity driving species richness across cleaning stations. Additionally, the type of cleaning station, its habitat complexity and the current moon phase had significant effects on the cleaning interaction duration of megafauna. Cleaning interactions were found to last longer during the New Moon phase, and on cleaning stations with a more complex structure. The project also found that the two client species making up the greatest proportion of cleaning interactions were the grey reef shark (*Carcharhinus amblyrhynchos*) and the reef manta ray (*Mobula alfredi*) which accounted for 70.01% and 9.14%

of observed cleaning interactions, respectively.

The findings show how conservation efforts should be targeted towards protecting the structural integrity of cleaning stations, as the quality of cleaning interactions is likely to decline if these sites experience degradation. This project's findings are also helpful for establishing methods to classify cleaning stations and understanding what makes them well functioning. The Manta Trust is currently investigating how this project can develop in the next year to keep track of cleaning station health.



OUR "EYES ON THE REEF" FOUND OUT WHEN MANTAS LIKE TO CLEAN

Ben Pearce used the Manta Trust's "Eyes on the Reef" study to uncover when and why manta rays are cleaning at cleaning station sites around Laamu atoll. Since 2021, the Manta Trust have deployed remote cameras (Our "Eyes on the Reef") at various cleaning stations around the atoll to study the areas when no humans are around. From 2021 to earlier this year, more than 450,000 photos have been taken and analyzed amounting to a sum of 7,579 hours and 41 minutes of time surveyed! From this data a total of 98.5% of photos had zero humans presence, highlighting the pristine manta ray cleaning locations around Laamu atoll. In total 2599 manta sightings were recorded through the remote camera systems, with some days having an estimated 20 mantas utilizing a single cleaning station throughout the day.

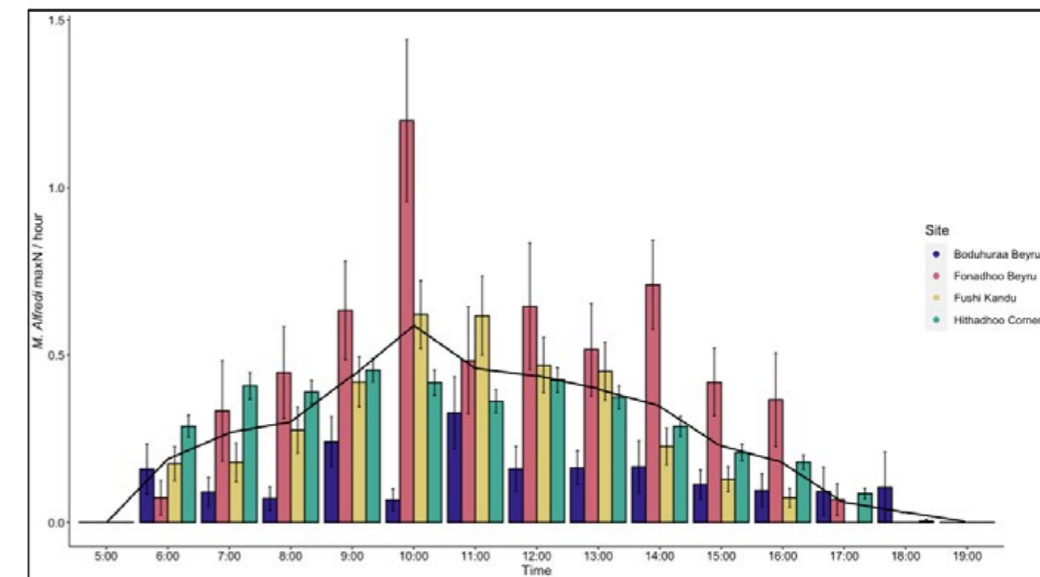
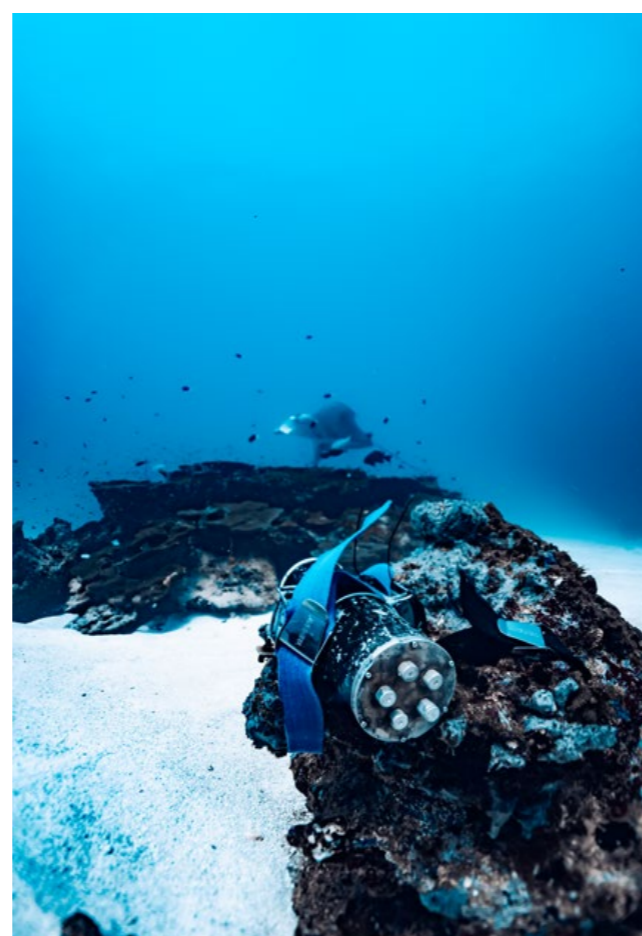


Figure 6 – The mean maxN of *Mobula alfredi* for each hour interval at each site; Boduhuraa Beyru (Purple), Fonadhoo Beyru (Orange), Fushi Kandu (Yellow) and Hithadhoo Corner (Teal). The black line is the collective mean average for all the sites.




More often than not, one or more mantas were sighted each day, and we found out that mantas are likely to stay longer at cleaning stations when other manta rays are around. From analysis, it seems that Laamu mantas are significantly affected by the moon state, monsoonal season and ocean primary productivity. Generally, the manta ray's presence peaked around 09:00 and 10:00. This follows research from elsewhere which considers such a peak in presence to be due to returning from deep-water foraging


at night and moving to shallower waters to warm up, clean, socialize and feed. The deployed cameras were, on occasions, able to capture adequate photographs of the manta's bellies for identification. Through this it seems that some individuals may reside around Laamu annually, whilst others likely leave the atoll for periods of the year. A total of 81 individuals were able to be identified through this remote technology. The study also found that mantas are more often sighted throughout the first quarter

of the moon which is in line with the findings of the biodiversity study, which used a different data set. Both studies made it clear how important such small areas are for the local manta ray populations in Laamu Atoll and that they spend a significant amount of time taking care of themselves (a.k.a. getting cleaned) and socializing with other individuals. We can't wait to see how much more we can learn about our favorite ocean giants, right on our doorstep.

 **81** individual mantas identified

 **455,458** photos analyzed

 **744** recording days between 2021 and start of 2023

 mantas most seen in 1st quarter of the moon cycle

BLUE MARINE FOUNDATION



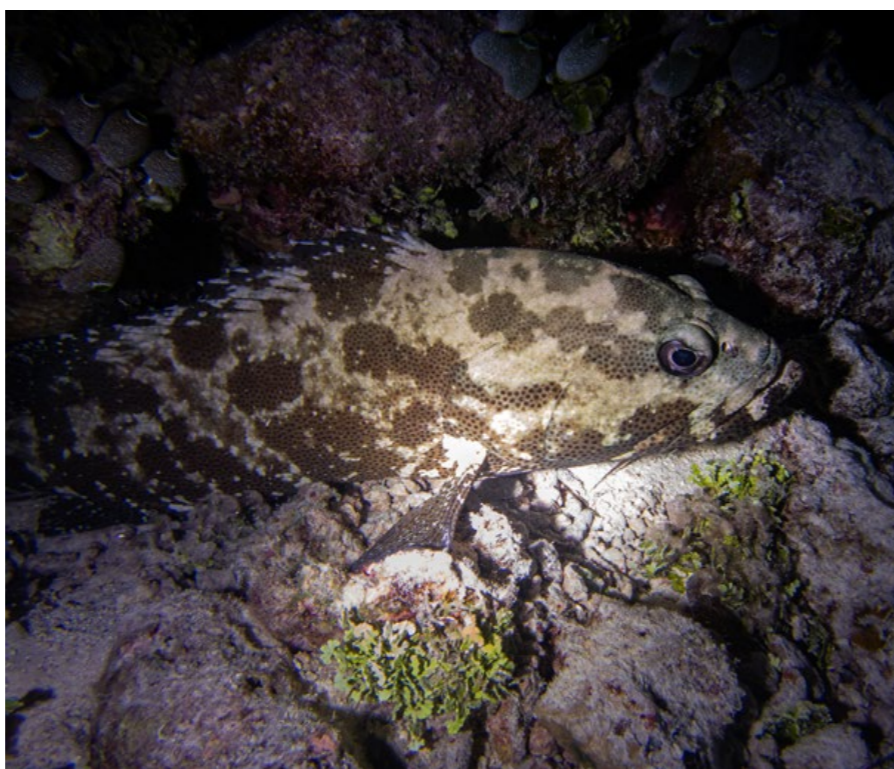
 **10** fishers sold fish

 **20** guest recreational fishing trips

 **312** fish landed

FISH OF THE MONTH THE CAMOUFLAGE GROUPEUR

The fish in the spotlight this month is *Epinephelus polyphekadion*, commonly known as the Camouflage Grouper.




These fish are often mistaken for Marbled Groupers due to their similar patterning. Camouflage Groupers have smooth heads and smaller bodies compared to Marbled Groupers. However, both species are renowned for their masterful camouflage abilities. They can reach substantial sizes, with adults often approaching a meter in length. Despite their intriguing biology, Camouflage Groupers face significant threats due to commercial exploitation. Overfishing poses a serious concern, jeopardizing their population numbers. Conservation efforts, such as marine protection and fisheries management are crucial to ensuring the preservation of this species and maintaining the ecological balance in their habitat. To address this, in addition to local protection efforts under the Laamaseelu Masveriyaa program, the team conducts research on changes in grouper aggregation numbers in known spawning areas within the Laamu atoll. Camouflage Groupers are one of the four known broadcast spawners identified in the atoll.

LAAMU HITHADHOO COMMUNITY CONSERVATION

This month the Blue Marine and MRR team provides an update on the four stakeholder consultation meetings held (in August) for Laamu Hithadhoo's Community Conservation Area (CCA), the first one of its kind in the Maldives.

This area is ecologically significant as a grouper and napoleon wrasse spawning site, green turtle aggregation area and manta ray cleaning station, it is also used by fishermen and tourism operators for diving, surfing and snorkeling. Fish from the area is a source of income and food for the local community. A total of 59 participants attended and all agreed that the area needs to be conserved and managed. Reasons identified include: 'to protect threatened species', 'to ensure food security', 'to facilitate employment opportunities for the youth of the island', 'to generate revenue for community projects', 'it is a valuable ecological and cultural heritage for the community', 'important fish spawning area', 'it has important dive and surf sites', 'maintaining the area for future generations to ensure sustainable livelihoods and economic opportunities'.

Participants at each meeting were asked for their feedback on the proposed user fees, permitted and prohibited activities and the management and monitoring of the CCA. All the feedback was collated and incorporated into the management plan. Since then the team has employed a legal consultant to draft a regulation (by-law) based on the draft management plan. Hithadhoo Council provided their feedback and the regulation is now with the Local Government Authority (LGA) for review. Once approved by the LGA and the Ministries, the regulation will be published in the government gazette, officially establishing the CCA and making it legally enforceable.

 **91** pieces of feedback incorporated into management plan

 **1** legal regulation drafted



GROUPEL SPAWNING SURVEYS FOR 2023 BEGIN!

In October the MRR and Blue Marine team began the annual grouper spawning surveys for this year. Surveys will be conducted for the next two months around the new moon period. The team will be surveying a reef in Laamu atoll where groupers are known to aggregate in large numbers to broadcast spawn on the days of the full moon and the new moon with a higher intensity at the new moon. 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.



Grouper spawning is a phenomenon enjoyed globally which provides essential food for predators like sharks. In the Maldives, this natural event has been exploited for decades, leading to a significant decline in grouper populations. Fishers target large males for profit, this has resulted in several commercially important grouper species to be listed as threatened on the IUCN Red list.

On the research dives the team will focus on four species of grouper, replicating the surveys done in 2016, 2017 and 2022. The team records any spawning behaviour exhibited by the grouper species such as biting, chasing and rubbing against each other. The data collected on these surveys will be compared to data collected in 2016, 2017 and 2022 at the same location and enable researchers to quantitatively assess any changes in grouper spawning numbers. The team will analyse the four years of survey data and publish the results in a scientific paper to inform future management and assess effectiveness of the area's protection in the future.



149 groupers observed



3 hours of dive surveys



3 dive surveys completed



THE OLIVE RIDLEY PROJECT



16 new turtles identified



123 submissions by MUI and DBD



24 in-water surveys



989 turtles in Laamu



73 hours of nest watch

WELCOMING ZIYAN TO THE TEAM!

Meet Ziyun, our new Sea Turtle Biologist Intern at Six Senses Laamu!

Ziyun grew up in Utheem island at Haa atoll in the northernmost region of the Maldives. Ziyun has been fascinated by the ocean and the beaches around the Maldives since a very young age. He spent a lot of his time in the ocean while growing up, either snorkeling, surfing or sailing around his island.

His real passion for ocean conservation was sparked when he witnessed the devastation caused by the mass coral bleaching event in 2016. Since then, he has wanted to make a difference in protecting the oceans and raising awareness within the community of the threats facing nature.

The internship at the Olive Ridley Project will provide Ziyun with his first opportunity to step into the field of marine conservation. Through the experience, he hopes to gain the skills and knowledge required for making a positive impact on the marine environment of the Maldives.





CREATING LOCAL CUSTODIANSHIP ON GAADHOO

Earlier this month, Inaan Ahmed, the Sea Turtle Ranger and Community Officer for Gaadhoo conducted a training session for 24 members of staff from AgroNational Corporation (AgroNat) on L. Gaadhoo. AgroNat is an agricultural company that currently operates and has permanent staff stationed on Gaadhoo - the site of the most significant nesting beach in the Maldives. Inaan presented on ORP's work in the Maldives and discussed the importance of Gaadhoo's nesting beach and his role in protecting it. He also provided information on sea turtle biology and conservation, emphasizing the importance of these

species to the marine environment and tourism economy of the Maldives.

Since ORP began ad-hoc surveys in 2018, they have recorded significant numbers of green turtle nests every year. Unfortunately, they also observed high rates of illegal harvest of the nests, with more than half of the eggs laid on the beach being taken for either sale or consumption. The Gaadhoo Ranger Program was introduced as a solution to this issue, and since its conception early this year, the team have seen an almost complete drop in illegal harvest activity. This is in part due to the presence of AgroNat staff, which is why it is

crucial to foster strong cooperation and relationships with their staff on the ground to build a vested interest in the protection of the nesting beach.

Outreach sessions like these are critical in creating a sense of environmental responsibility and custodianship within the local community. Inaan's training has equipped AgroNat staff with essential skills and insights, such as identifying sea turtle species, understanding nesting behavior, and the importance of safeguarding turtle habitats.

 **24** AgroNat staff trained

RESCUE OPERATION FOR GREEN TURTLE NESTS

This month the ORP team in Laamu carried out emergency relocations for the two green turtle nests on the island that were under serious threat from beach erosion. These two nests were laid near the vegetation line by the same female in early September.

Unfortunately, high spring tides in October lead to huge portions of the main nesting beach on the southwestern side of the island eroding away, exposing both of these nests to extremely high risk of flooding. Fortunately, the team were able to act quickly to excavate the 143 eggs in both nests and carefully move them to a more secure location on the beach, out of reach from the waves. One of these nests has already hatched successfully with over 80% of the nest emerging and beginning their journey in the ocean.

Sadly, the loss of suitable nesting beach space in the Maldives is becoming a growing concern for nesting populations in the face of climate-associated sea level rise and increased storm surge activity. As the survival of sea turtle populations are closely tied to the health of their nesting habitats, they are at the forefront of the impacts climate change is projected to have on the planet. While global action is required to tackle a complex and wide-reaching issue such as climate change, local conservation efforts are also essential in building resilience for Maldives' sea turtles and their nesting habitats.



 **143** eggs successfully relocated

TURTLE IN THE SPOTLIGHT



Say hello to Andiza! (HK976)

Andiza is one of our most frequently sighted hawksbill turtles at Hithadhoo Corner - our most frequently visited dive site and a well-known hotspot for cleaning manta rays and resting green turtles. Andiza was first sighted as a 35cm juvenile at our reefs in May 2014 and has since been encountered 89 times, making them one of the oldest members to Laamu's photo ID database! Although Andiza has been a resident of Laamu for almost 10 years, they have only grown about 15 cm and is still just a juvenile.

Hawksbills, like most other sea turtle species, are very slow maturing animals, and can take anywhere between 25 to 50 years to reach sexual maturity! It's therefore no surprise that even after all this time, Andiza still remains a juvenile hawksbill, albeit a much larger one.

Andiza has shown to be very territorial when it comes to foraging at this site, and on some occasions, has chased off and even bitten other juvenile hawksbills who were a little too close to Andiza's favorite patch of sea sponge.

Hawksbill turtles are known for the distinctive pattern on the overlapping scutes of their carapace. Sadly, these scutes are the source of the 'tortoise-shell' pattern that is so highly prized in the black market, which has led to the death of huge numbers of hawksbills around the world. Today, they hold a 'Critically Endangered' status as a result of the population loss from the tortoise-shell trade. We are therefore incredibly lucky to still be seeing hawksbills such as Andiza inhabiting our reefs for so many years, and hopefully, for many more years to come.

OUR HOME

 **48,250** KWH
renewable energy

 **5,000** Kg metal
recycled with SecureBag

 **62** guests experienced
our local islands

 **400** eggs produced

SHIFTING THE TIDES OF PLASTIC POLLUTION



It should come as no surprise that plastic pollution is a huge, global problem that often affects our coastal communities the most; the Maldives is no exception to this. A lack of access to clean drinking water combined with a young tourism industry (less than 50 years old!), has led to an over-reliance on plastic. Maldives SHiFT is a holistic program, led by eXXpedition, to help tackle plastic pollution. In October, Lawrence,

Six Senses Laamu's Director of Sustainability and Conservation, attended the action-focused stakeholder meeting as the only tourism resort representative. The meeting announced the results of a plastic use survey and various strategies that both private industry and the government have to tackle plastic pollution. Ali and Afaaz also attended the meeting as members of SHiFT's youth leadership program.

WELCOME TO THE TEAM

MEET RISFAAN!

Earth Lab has a new face, Ahmed Risfaan from Kunahandhoo island in Laamu atoll.

We are thrilled to welcome Risfaan as our new Sustainability Intern. He has already shown a passion for innovating and improving our workshops and guest experiences, such as developing the paper making workshop into creating a recycled book, and including traditional Maldivian plant-based medicine in our garden tours.

Risfaan is also studying Hospitality Management in his spare time (he just graduated from Level 4) and wants to use his knowledge and skills to create meaningful connections between tourists and the Maldives.

Risfaan has also caught the travel bug and wants to see the whole world, first stop Thailand. He's on a mission to find the elusive Indochinese Tiger, where there are fewer than 350 in the wild!



WE COULD NOT HAVE DONE IT WITHOUT YOU!

We are tremendously grateful to the multitude of donors who so generously donated funds to the MUI team's research projects; we are indebted to you all.

A special shout-out to our friends who donated \$10,000 USD and more:

Jeffrey
Andy and Amy
Erin and Don
Take Two London
Sabine and Guy

We look forward to sharing with you the achievements that you made possible.

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

Greg Holder

Base Leader & Guest Education Coordinator
greg.holder@sixsenses.com

Lawrence Menz

Director of Sustainability and Conservation
lawrence.menz@sixsenses.com

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.

@maldivesunderwaterinitiative



@sixsenseslaamu

