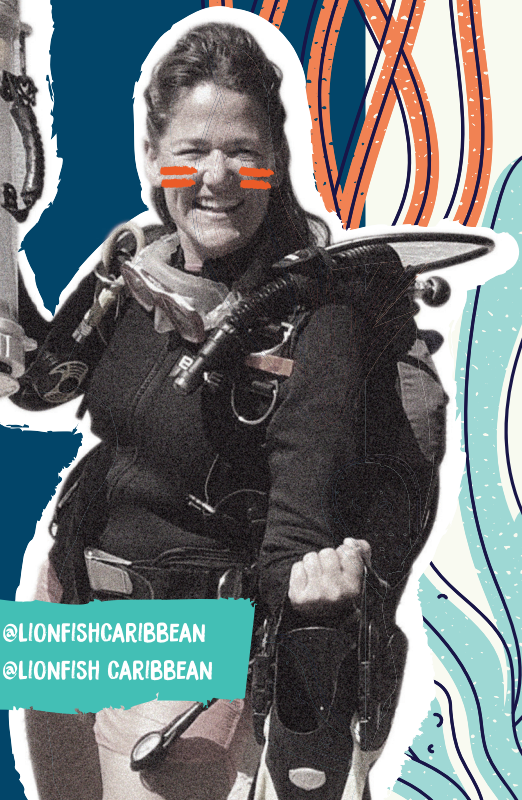
FROM INVASIONS TO TREASURES

LISETTE KEUS HUNTS LIONFISH FOR A LIVING IN CURAÇAO IN THE CARIBBEAN.

ARMED WITH HER SPEAR, LISETTE CATCHES AS MANY LIONFISH AS SHE COMES ACROSS. RESTAURANTS BUY THIS INVASIVE SPECIES FROM HER AND LISETTE USES THEIR BEAUTIFUL FINS TO MAKE JEWELRY. IF NOT FOR HER AND OTHER SPEAR FISHERS THIS LAST DECADE, THE INVASIVE LIONFISH WOULD BE AN EVEN BIGGER PLAGUE AROUND THE ISLAND THAN IT IS ALREADY.





@LIONFISHCARIBBEAN
@LIONFISH CARIBBEAN

HOW DID THE LIONFISH COME FROM THE INDO-PACIFIC INTO THE CARIBBEAN? PROBABLY BECAUSE THEY GOT RELEASED FROM AQUARIUMS OR THEY ACCIDENTALLY TRAVELED ALONG WITH SHIPS.

Lionfish have pointy spines, big fans of fins, antenna-like tentacles and a colored pattern of fierce red and white zebra stripes as if the fish is warning us not to come closer. Its movements are slow and graceful as if it's floating over the reefs. Have you ever seen a lionfish in the wild? Or maybe you have seen one in a video. Lionfish are one of the most beautiful creatures you will see in the ocean. So why hunt and kill them?



Lionfish are an extremely invasive species. Originally, they are from the Indo-Pacific. Nowadays, they are also present in the West Atlantic Ocean, in the Caribbean Sea and recently, since 2016, also in the Mediterranean Sea. They are active hunters and eat almost everything they come across. They eat prey up to half of their body length, and their stomach can expand up to 30 times their normal volume. To the contrary, they can also live for three months without eating anything. Lionfish have a lack of natural predators; therefore, their population can grow enormously.

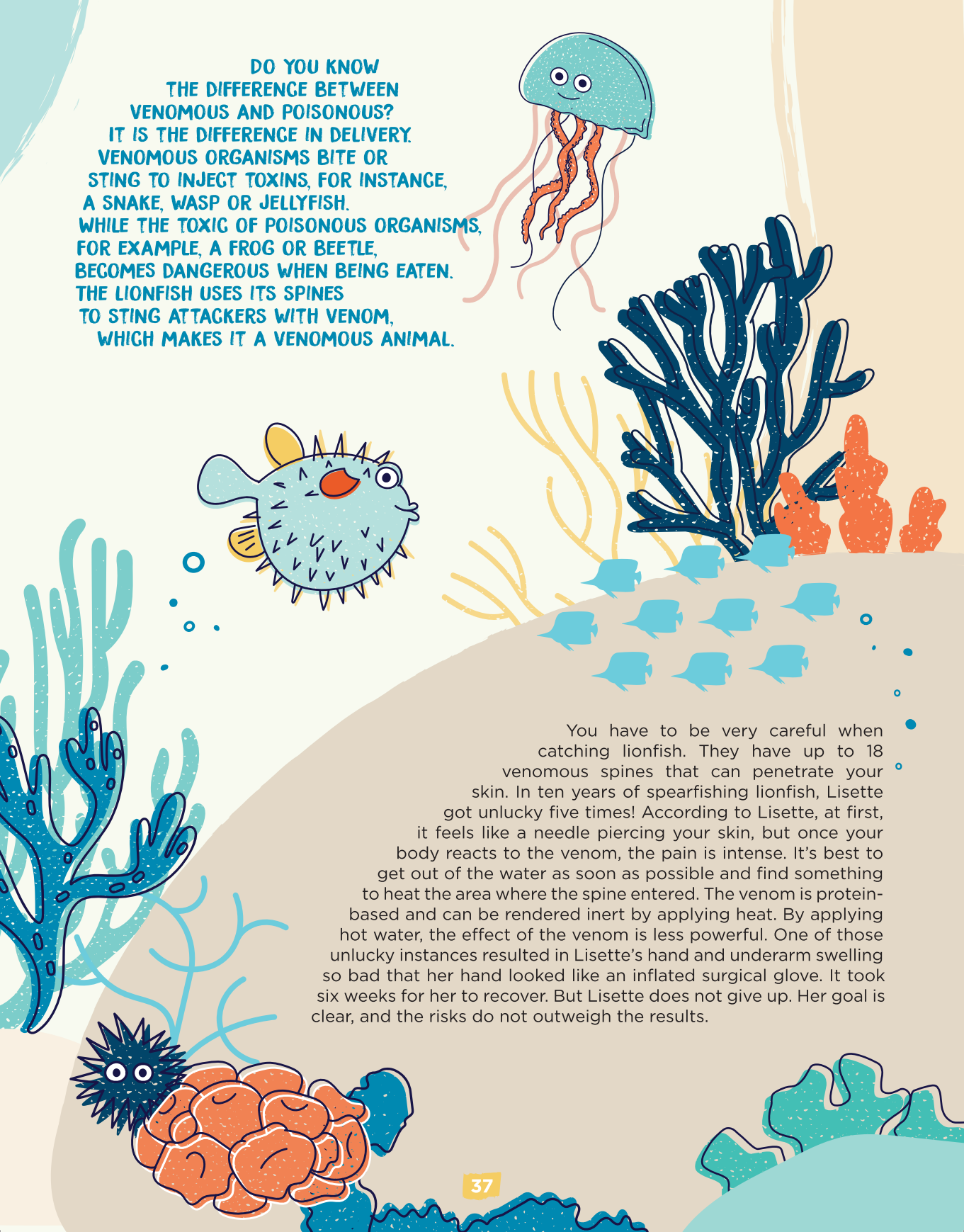
On top of that, they reproduce every three to four days. With up to 30.000 eggs per time, they produce millions of offspring a year. That is how the lionfish can spread at such a rapid pace, especially when you consider that they tolerate many different habitats. They even live at 300 meters (1000 ft) below the surface. Some native species have been eaten so much by lionfish that their population has been reduced by 90%. Those fish usually eat algae of corals, making sure coral reefs stay healthy. The lionfish disrupt whole ecosystems and eventually kill all the fish and therefore, also the reefs.

Lisette declared war on the lionfish that threatens her beloved coral reef and marine life. She spearfishes the lionfish to combat as many as possible. The lionfish is a passive hunter: it waits until prey swims by and then it attacks. That is why it moves so slowly and does not swim away when you come closer. That makes hunting the lionfish easier for us.

Actually, it is prohibited to spearfish at Curaçao, but the officials make an exception for lionfish and tolerate the hunt.
Like a catapult, you release the spear's elastic, after which it launches toward its target. When you shoot one, you put it in your containment device, which is a tube the lionfish can go in but cannot get out of.
A lionfish containment unit can hold up to 30 fish.

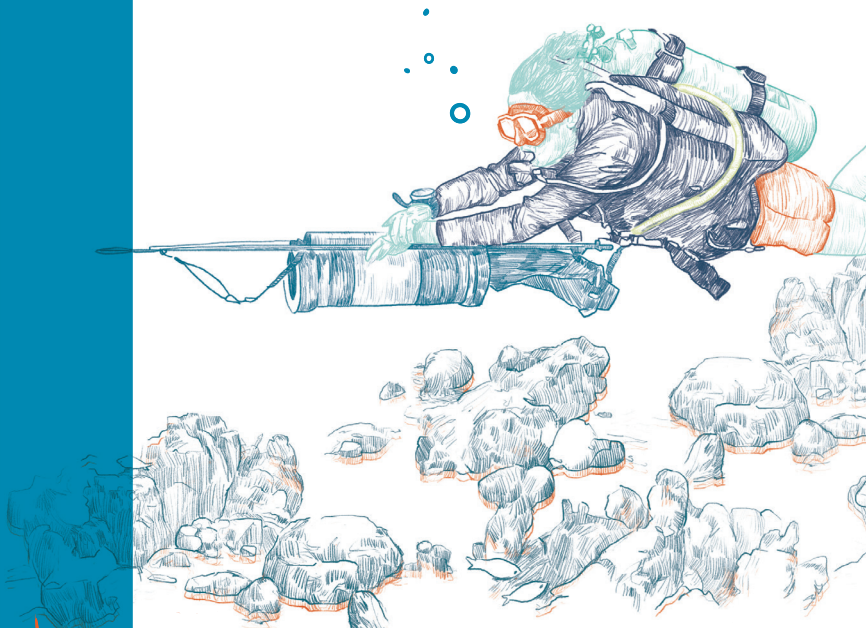


DO YOU KNOW
THE DIFFERENCE BETWEEN
VENOMOUS AND POISONOUS?
IT IS THE DIFFERENCE IN DELIVERY.
VENOMOUS ORGANISMS BITE OR
STING TO INJECT TOXINS, FOR INSTANCE,
A SNAKE, WASP OR JELLYFISH.
WHILE THE TOXIC OF POISONOUS ORGANISMS,
FOR EXAMPLE, A FROG OR BEETLE,
BECOMES DANGEROUS WHEN BEING EATEN.
THE LIONFISH USES ITS SPINES
TO STING ATTACKERS WITH VENOM,
WHICH MAKES IT A VENOMOUS ANIMAL.



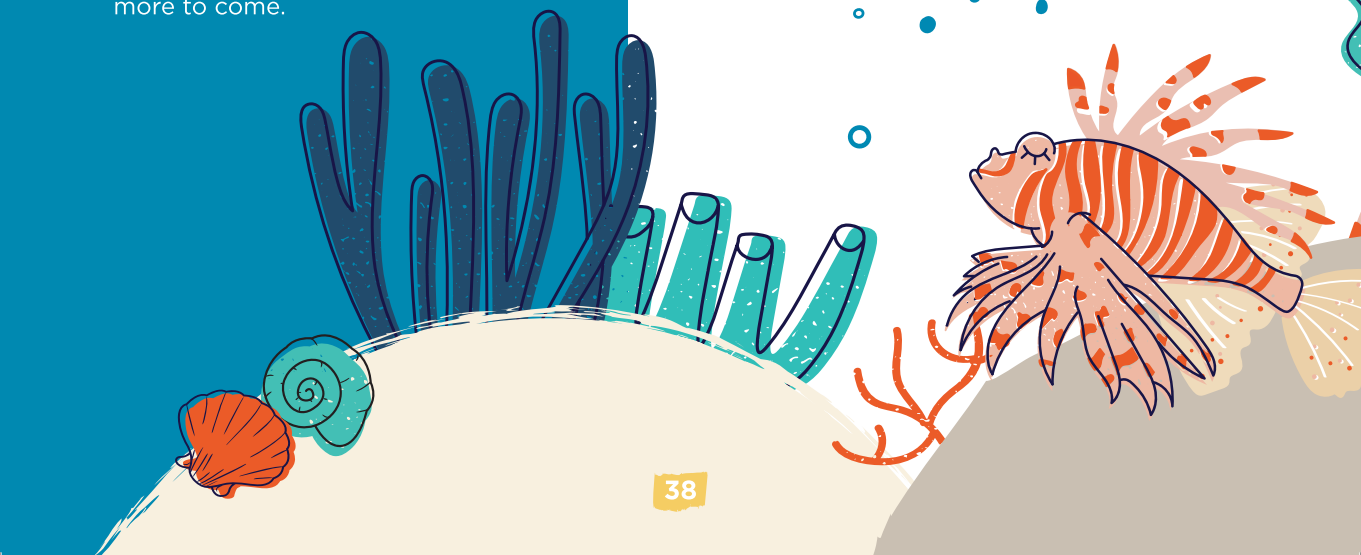
You have to be very careful when catching lionfish. They have up to 18 venomous spines that can penetrate your skin. In ten years of spearfishing lionfish, Lisette got unlucky five times! According to Lisette, at first, it feels like a needle piercing your skin, but once your body reacts to the venom, the pain is intense. It's best to get out of the water as soon as possible and find something to heat the area where the spine entered. The venom is protein-based and can be rendered inert by applying heat. By applying hot water, the effect of the venom is less powerful. One of those unlucky instances resulted in Lisette's hand and underarm swelling so bad that her hand looked like an inflated surgical glove. It took six weeks for her to recover. But Lisette does not give up. Her goal is clear, and the risks do not outweigh the results.

Every caught lionfish Lisette sells to local restaurants. At first, she went from one to another with a cool box in her hands, showing the chefs the lionfish and explaining how to clean and cook them. She created her own market. Now the chefs clean the fish and keep the fins for Lisette. She picks them up, washes and dries them. When dried in the sun, the fins become black and white. When dried in the shade, the fins then stay more orange. Eventually, she makes earrings, bracelets, rings and more with those dried fins. It took a bit of practice to get to the beautiful jewelry she makes now. It wasn't easy to figure out the best way to handle the fins in order for them not to smell like fish anymore and also keep their beautiful form and pattern. Another challenge for Lisette was finding the best stainless and rust-free materials. Persistent as she is, though, Lisette found a way. Nowadays, the jewelry gets sold on Curaçao, Sint Maarten, Sint Eustatius, Saba, Antigua, Bermuda, Costa Rica, the United States and more to come.









The demand for Lisette's jewelry has become higher and higher, but Lisette now gets help from the community on the island. She dives and catches the lionfish. Meanwhile, the islanders collaborate to make the jewelry and help to fabricate the packaging, which are made of old bottle dividers for beer boxes. This way, Lisette has created a social workplace on the island.

It is very unlikely humans can eradicate the whole population of lionfish. They're here to stay. Thus we all must do everything we can to manage their population growth until nature finds a way to restore the balance on the reef. If you're in an area where lionfish is a plague, learn how to dive and how to hunt lionfish. If you don't want to or can't dive, eating the problem is a great solution. If you see lionfish on the menu of a restaurant, order the lionfish. You make a sustainable choice by not ordering species like tuna or snapper, which are important for our reefs to stay healthy. Same goes for other invasive species:

EAT IT TO BEAT IT!



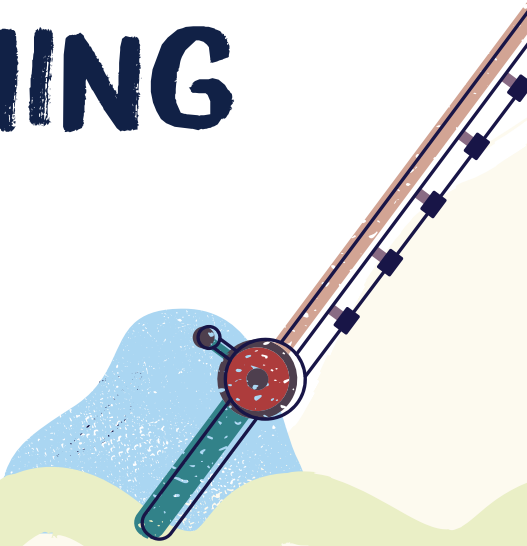


THERE ARE MANY WAYS YOU CAN PREPARE A LIONFISH. THE TEXTURE IS SIMILAR TO THE GROUPER, AND ITS TASTE IS VERY DELICATE. YOU CAN PREPARE THE LIONFISH DEEP-FRIED, GRILLED, AS SASHIMI OR AS CEVICHE. LIONFISH IS A SUSTAINABLE ALTERNATIVE FOR OTHER FISH, LIKE GROUPERS, SNAPPERS, OR DORADO (MAHI-MAHI). IT'S HEALTHY AND TASTY TOO. IF YOU APPLY HEAT TO THE MARINE VENOM, IT IS NO LONGER ACTIVE. THAT'S WHY IF YOU BAKE A VENOMOUS SPINE IN THE OVEN, THE VENOM SOLIDIFIES AND IS NO LONGER ACTIVE. WHEN SERVING CEVICHE, LISETTE PRESENTS A LARGE SPINE ON TOP. THE VENOM IS OUT, AND PEOPLE CAN EAT WITH THE SPINE LIKE CHOPSTICKS OR USE IT AS A TOOTHPICK.

COMBATING ILLEGAL FISHING

TONY LONG MAKES IT EASIER TO TRACK DOWN ILLEGAL FISHING ACTIVITIES BY PROVIDING TRANSPARENT DATA.





TONY HAS A MASTER'S DEGREE IN DEFENSE STUDIES FROM KING'S COLLEGE IN LONDON. HE DIRECTED THE END ILLEGAL FISHING PROGRAM FOR PEW CHARITABLE TRUSTS. PRIOR TO THAT, TONY WAS A COMMANDER IN THE ROYAL BRITISH NAVY, WHERE HE SPENT 27 YEARS IN SERVICE. NOW, TONY IS CEO OF GLOBAL FISHING WATCH. USING SATELLITES AND ARTIFICIAL INTELLIGENCE, GLOBAL FISHING WATCH TRACKS FISHING VESSELS AROUND THE WORLD. THEY SHARE THIS DATA ONLINE FOR FREE AND IN NEAR REAL-TIME.

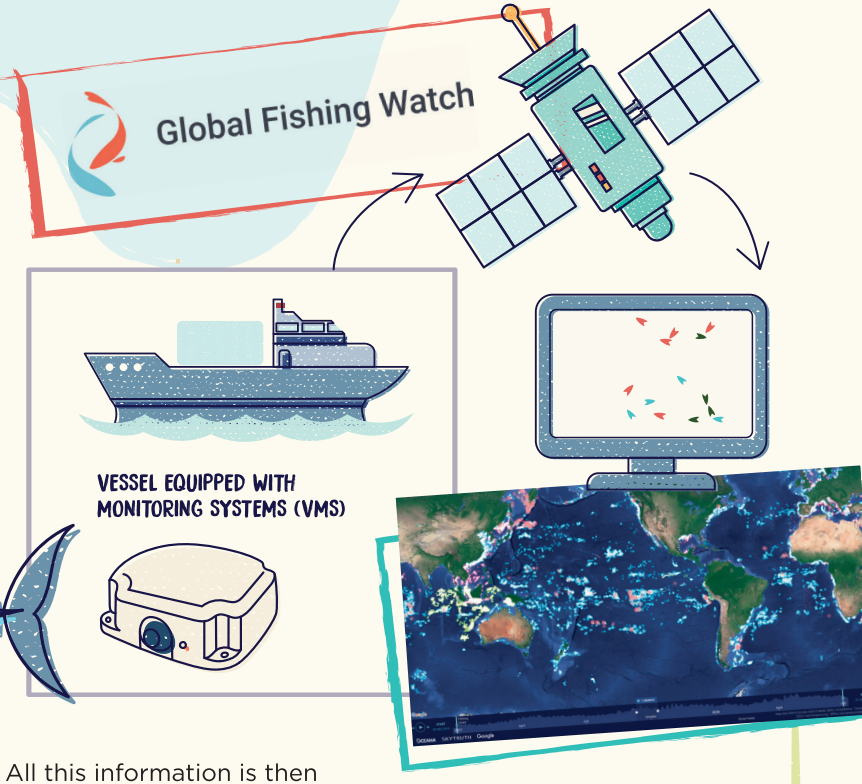


@DARKBLUEBLOKE
@GLOBALFISHWATCH

@GLOBAL FISHING WATCH

More than 85% of the world's marine fish stocks are now fully exploited, overexploited or depleted. Some fish, like the Atlantic bluefin tuna, have been hunted so heavily they are now an endangered species. One of the greatest threats to sustainable fishing is illegal, unreported, and unregulated (IUU) fishing. Worldwide, probably one in five fish are caught illegally.





Illegal means fishing without a license or using prohibited techniques. It could also mean fishing in prohibited zones or outside the legally permitted period. If we want our oceans to remain vibrant and healthy for us and future generations, we need to do something about this.

Tony is at the head of Global Fishing Watch. This organisation tracks the movement of large commercial fishing boats across the global ocean. Many large vessels are obligated to carry a transponder to broadcast their location and help them from running into each other at sea. The pings from these automatic identification systems (AIS) are picked up by satellites. The ships can be followed even to the most remote parts of the ocean.

All this information is then stored in big online datasets.

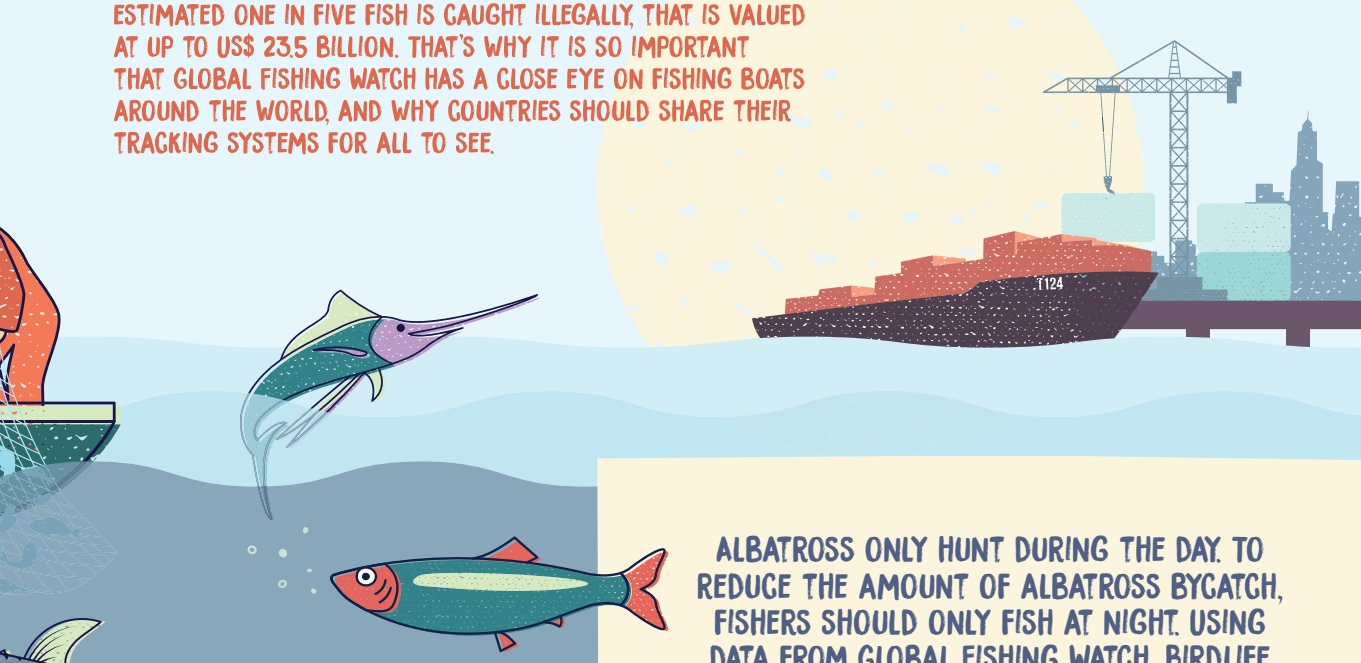
Data from other sources are also used, like vessel monitoring systems (VMS) from different countries. Indonesia became the first country to make its VMS information available for Global Fishing Watch. Smaller commercial fishing vessels that don't use AIS or VMS will also be tracked by integrating their transponder systems into the map platform. Next to that, radar systems and infrared imaging are used to detect lights. Computer algorithms search the data for ship movement patterns. Using machine-learning, Global Fishing Watch can tell what kind of fishing gear the ship is using and where and when it's fishing. All this near real-time information is available for free on their website.

With the data and analysis from Global Fishing Watch, we can identify where suspicious fishing takes place and where IUU fishing hotspots are located. When fishers know they are being watched and tracked, their behavior will change. The deterrence idea is important because there are just too many vessels to catch fishing illegally. That's why we make clear we can see what they are doing, so they behave better. Also, with an interactive map, Global Fishing Watch provides full transparency for governments, organizations, and multinational law enforcement agencies. This allows those agencies to act when unauthorized vessels are fishing in their territory.



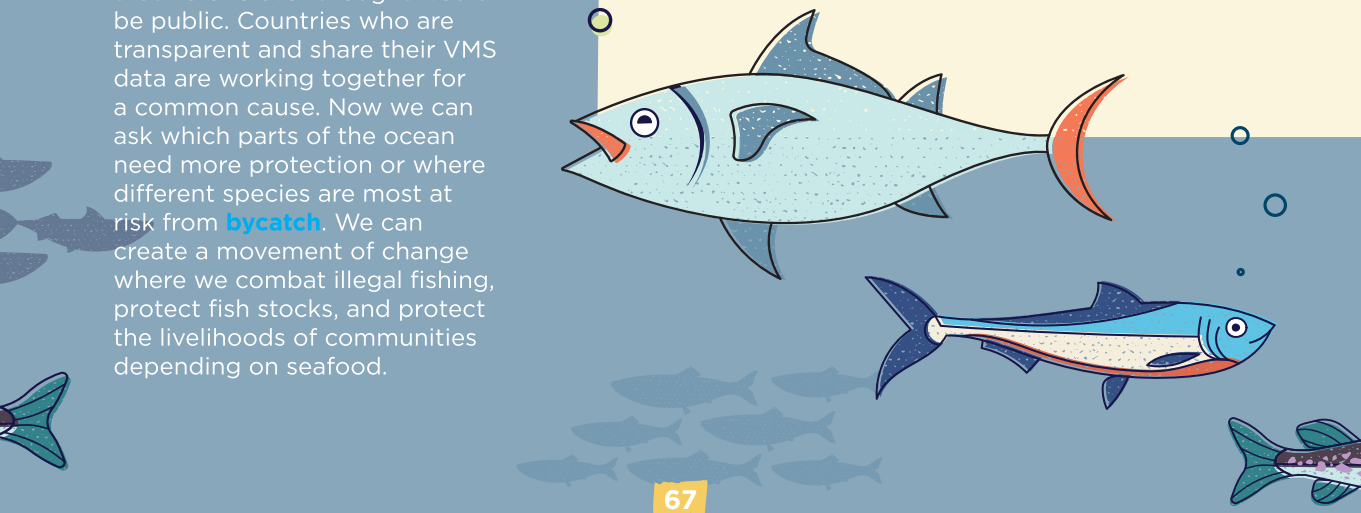
It is difficult to track down illegal fishers on the **high seas**. That said, it is not necessary to catch them there if we close the ports and trade markets on which they depend. Fishing vessels which don't want to use a tracking device or use a wrong one should be denied from entering ports. The paperwork should match with the Global Fishing Watch tracks. If it doesn't, something is wrong. It is the same when you visit another country. You have to show your passport, visa, hotel booking, return ticket, and financial funds to show you are there in good faith before you enter. If not, the border force of the country does not let you in. As an experienced naval officer and surveillance expert, Tony argues for doing the same with fishing vessels. We should all know who is taking what fish, where, how, and by whose command. We need to understand what is happening around the world to ensure there is enough fish for generations to come.

WORLDWIDE THERE ARE ALMOST 4.6 MILLION FISHING BOATS, OF WHICH APPROXIMATELY 2.8 MILLION ARE MOTORIZED. OF THE MOTORIZED VESSELS AROUND 300,000 ARE CONSIDERED LARGE VESSELS AND AROUND HALF CARRY AN AIS DEVICE. NOT ALL OF THOSE ARE ACTIVE AND GLOBAL FISHING WATCH TEND TO SEE AROUND 65,000 VESSELS OPERATING WITH AIS REGULARLY. IT IS ESTIMATED ONE IN FIVE FISH IS CAUGHT ILLEGALLY, THAT IS VALUED AT UP TO US$ 23.5 BILLION. THAT'S WHY IT IS SO IMPORTANT THAT GLOBAL FISHING WATCH HAS A CLOSE EYE ON FISHING BOATS AROUND THE WORLD, AND WHY COUNTRIES SHOULD SHARE THEIR TRACKING SYSTEMS FOR ALL TO SEE.



Global Fishing Watch is an asset to all governments, seafood retailers, and fishers who do play by the rules. Tony is most proud of the ability of Global Fishing Watch to expose information that no one ever thought would be public. Countries who are transparent and share their VMS data are working together for a common cause. Now we can ask which parts of the ocean need more protection or where different species are most at risk from **bycatch**. We can create a movement of change where we combat illegal fishing, protect fish stocks, and protect the livelihoods of communities depending on seafood.

ALBATROSS ONLY HUNT DURING THE DAY. TO REDUCE THE AMOUNT OF ALBATROSS BYCATCH, FISHERS SHOULD ONLY FISH AT NIGHT. USING DATA FROM GLOBAL FISHING WATCH, BIRDLIFE INTERNATIONAL DISCOVERED THAT OF THE BOATS THEY STUDIED, ONLY 15% OF ALL FISHERS PUT THEIR LINES OUT AT NIGHT. THANKFULLY, THERE IS A NEW SMART INVENTION TO REDUCE ALBATROSS BYCATCH, (SEE CHAPTER BYE BYE BIRD BYCATCH, PAGE 40).





TONY (ALL THE WAY LEFT) IN THE ROYAL NAVY



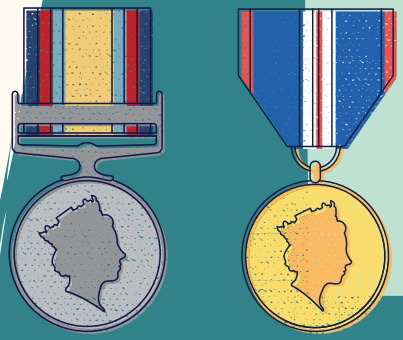
TONY AT 10 DOWNING STREET

WITH THE DATA, WE CAN ALSO ESTABLISH AND MANAGE MARINE PROTECTED AREAS (MPAS). IN ARGENTINA, TWO MPAS WERE FORMED WITH THE HELP OF GLOBAL FISHING WATCH DATA. THE FISHING INDUSTRY WAS OPPOSED BUT AGREED TO THE MPAS WHEN THEY SAW ONLY FOUR VESSELS FISHED IN THE PROPOSED AREA. THOSE VESSELS WERE RESPONSIBLE FOR LESS THAN 1% OF ARGENTINA'S TOTAL YEARLY FISHING EFFORT. THEY COULD BE RELOCATED WITHOUT CAUSING ANY JOB LOSSES. WITH THE FISHING INDUSTRY ON BOARD, THE GOVERNMENT SIGNED THE BILL FOR THE PROPOSED MPAS. NOW, 10% OF ARGENTINA'S SEAS ARE PROTECTED FOR CONSERVATION.



NEVER GIVE UP

IF TONY COMMITS TO SOMETHING, HE DOESN'T GIVE UP. HE CAN THINK OF EXAMPLES WHEN HE DIDN'T DO AS WELL AS HE COULD HAVE, BUT HE HAS NEVER GIVEN UP. THOSE EXAMPLES ONLY TAUGHT HIM TO BE BETTER PREPARED. IN HIS FREE TIME, TONY CYCLES FOR CHARITY. ONE OF THOSE RIDES WAS A 24 HOUR BIKE RIDE WHERE PEOPLE SPONSOR HIM. EVEN WHEN HE WAS NOT IN HIS FITTEST CONDITION, TONY GOT ON HIS BIKE AND DID THE BEST HE COULD. ACCORDING TO TONY, "ONE WAY OR ANOTHER, YOU HAVE TO GET THROUGH IT. IT IS THE SAME WITH GLOBAL FISHING WATCH. WE ARE ASKING COUNTRIES TO DO THINGS THEY HAVEN'T DONE BEFORE. THERE ARE PEOPLE WHO SAY IT'S NOT POSSIBLE TO ACHIEVE WHAT WE WANT. BUT WE ARE SLOWLY PROVING IT IS. WE ARE MAKING A CHANGE, SO WE SHOULD NOT GIVE UP."



Tony was only 17 when he joined the Royal British Navy. It was a real adventure, and serving in the military taught him a lot. He learned about personal responsibility, how to work as a team, and to be sympathetic toward other people. Tony has visited 50 different countries and over 100 different cities around the world. Tony says, by seeing people in their own environment and heritage, you gain a better understanding of why people behave as they do. Sometimes there is more to it than meets the eye, and this goes for our oceans as well. When you are on the surface of the water, you don't see the damage being done to the ocean. The ocean appears so vast that you think it can't possibly fail. But it can fail, and we need to look after it.

