CHAPTER TEN

IN SEARCH OF BLUE SHARKS

The first time you ever set eyes on a blue shark, *Prionace glauca*, you understand how its amazing sapphire color became synonymous with its name. The deep ultramarine blue skin does not hide the natural selection process that catapulted this extraordinarily agile species into its rightful place as one of the top predators in the oceans. The blue shark has a wealth of survival and hunting capabilities courtesy of evolution. Its stunning coloration is dark indigo on its dorsal (spinal) surface lightening up to a brighter blue on its flanks and to a pale white on its stomach. This counter shading gives the sleek swimmer superb camouflage, making it barely visible from unsuspecting prey swimming beneath it or to aggressors tracking it upwards from the ocean floor. (In death, these fabulous tints fade away with the creature's departing vitality.)

While such sharks gliding through the sea are very photogenic, running your hands over that deceptively smooth body could cost you several fingers but it will definitely give you the sensation of caressing sandpaper. Tiny tooth-like placoid scales cover the blue's skin; these small denticles generate vortices to reduce drag and help the animal's swimming efficiency. Blue sharks are Olympian swimmers, some reaching speeds of 60 to 70 kilometers an hour in short bursts. What power-drives that streamlined body through the waves are its many fins: two long pectoral fins that act pretty much like the ailerons of an aircraft, assisting the shark to steer left and right, two dorsal fins along its back ensure a steady course, a single anal fin and an elongated caudal or tail fin provides remarkable thrust.

Blues breed as all sharks do—through internal fertilization, similar to the way

mammals breed, where the male inserts his reproductive organ into the female's genital orifice. Male sharks are endowed with a unique trait in reproductive function. They possess, not one but two copulatory organs, called *pterigopods*, or claspers. Mating is preceded by a generous amount of pre-copulatory behavior, but what consists of dinner and a movie in the human race, turns into ferocious biting of the female shark by the male. The biting is in fact so fierce that female sharks have skin that's double the thickness of the male's skin. Once the male has subdued the female by firmly biting her pectoral fin and wrapping his tail around the female's, he inserts whichever clasper is closest to her genital orifice and sperm is transferred.

A few months later (6 to 9 in blue sharks but this may go up to 24 months in some shark species) small infant sharks will be born but, unlike mammals, they receive no parental care from neither mom nor dad. As such, 25 to 50 blue shark pups swim freely and have to grow up fast, since their infancy is spent in open waters and larger sharks find them particularly appealing…to eat. Occasionally odd mutations occur; both in sharks and other animals, and bizarre embryos appear, such as the two-headed individual shown. These are most likely a result of chemicals which accumulate in the water and trickle their way up the food chain, as blue sharks sit right at the top and therefore accumulate whatever nasty substances littering the oceans that their prey have been incorporating.

Fig. 13.1 – Two headed blue shark landed by Spanish commercial fishermen.

Blue sharks grow up to 3.8 meters or approximately 39 feet, and are believed to live 20 years, maybe more. The blue has huge puppy-like eyes rimmed in white that are efficient for hunting at night and in detecting motion among clouds of sandy debris or bioluminescent organisms. It also possesses a third protective eyelid (a nictitating membrane) to pull down just before darting at a prey. Included in the heightened senses department is the shark's capacity to smell, which uses up to sixty-five percent of its brain; it can also hear a fish several kilometers away. The long handsome snout has specialized sensors around the mouth and nose that go by the operatic title of the "Ampullae of Lorenzini". Despite the Italian designer label, these receptors detect faint bioelectrical fields discharged by other sea creatures at close range, enabling the shark to calculate the distance between itself and dinner.

The list of dietary weaponry would not be complete without referring to the animal's dental work. The blue shark is an every opportunity eater who enjoys (and needs) a high protein cuisine to fuel its energy (but humans are never on the menu). Its dining preference is for easier-to-catch prey. Its teeth are serrated like a band saw, the upper set being broader than those in the lower jaw. It can swallow small fish and squid whole or chomp up larger captures with a blender-like efficiency while gripping them in a vice-tight bite. Its diet includes a variety of pelagic fish such as herring, hake, haddock, mackerel, tuna, and squid. Lots and lots of squid. When conventional prey are scarce, the Blue takes to filtering a meal through its gills that have thin rakers to prevent small snacks like anchovies, pelagic salps and krill from escaping ingestion. These sharks are often seen swimming with their mouths open through colonies of krill, gathering them up much in the same way a baleen whale feeds.

THE GLOBAL WAR ON SHARKS AND BLUES IN PARTICULAR

Slender, elegant, a splendid vision of muscular grace and speed in the marine environment, the blue is one of the sea's most impressive of sharks.

"Beauty, agility", and other related qualities, however, are not the only attributes one owes to the animal. Where there should be a sense of human regard and kinship with this magnificence in the water, we find a story shrouded in ugliness. For blue sharks are the heroes of a horrific tale of profiteering. The species ranks first on the bloody list of their kind caught commercially worldwide and are, for now, abundant in temperate oceans throughout the globe, which causes them to be equally vulnerable prey to longlines and gill nets soaking all over the seven seas. Although they have not yet joined the sad and ever-growing list of endangered creatures, like all species subjected to uncontrolled human hunting, blue sharks are currently so over-exploited that their long-term survival is dubious.

It's a myth to assume that only Asian fishing fleets are extirpating the oceans from sharks of all varieties, as if the animals were cancer cells targeted by chemotherapy. The entire commercial fishing industry makes war on sharks, an indiscriminate and wholesale slaughter that goes beyond harvesting a food source. "Finning" is the major lucrative reason for global shark murder and Portuguese, Spanish, French, Central American, and even North American commercial fishing fleets all indulge in this hideous practice. Fins brutally cut from living sharks are later dried and used to make shark fin soup that is, in fact, a common variety chicken soup to which is added the dried cartilage of shark fins, which are virtually tasteless but provide the soup *texture* and make it thicker.

Fig 13.2 INSERT PHOTO OF SHARK CORPSE AFTER BEING "FINNED" - TO COME

One little known irony is that the cartilage, if consumed in high quantities, may cause sterility in men due to its high mercury content. (Shark payback on humans—one might think!) The market for this so-called exotic soup is the main reason why commercial fishermen catch sharks, hack off their fins while they're still alive, and throw their mutilated bodies in the water to suffer an agonizing death. A shark without fins cannot swim, and therefore no oxygen-rich water enters its mouth or through its gills. They die from asphyxiation or from hypovolemic shock, meaning the animal literally bleeds to death and their hearts shut down. Finning is the maritime version of killing gorillas for their paws (for they make such delightful ashtrays in the hunter's living room next to the stuffed pandas and grizzly head on the wall) and is just as senseless. Consider the gross stupidity of eventually eliminating a unique species just to improve a soup!

CONSERVATIONISTS, POLITICIANS, AND THE FATE OF SHARKS

The ugly practice of finning is active worldwide today as it has been for decades, despite multiple conservation efforts to ban it totally from the oceans. However, when we look to politicians to enforce such a ban, they always seem to have a hard time making such decisions on their own. So they ask for advice from other men, and women, in suits, who take them out to lunch, or maybe to see some pretty girl dancing around a pole while the "suits" explain the monumental profit to be gained from selling shark fins and the wonders it does for the economy, especially in the current economic climate.

Then it's time for the conservationists to take the same politicians out for lunch– but our story unfortunately doesn't involve fat profits or juicy bottom lines. It speaks of nature, of biodiversity, of leaving the oceans rich with marine life, the elegant blue shark included, for the benefit of generations to come. These arguments, as powerful as they are, weigh very little on the scale against the huge amounts of money that comes from selling fins. Who knows whether a fraction of such profits even find its way into the decision-makers' pockets? Maybe not in the shape of an envelope slipped under the table, but perhaps in a more socially accepted way, such as a family holiday in Aruba with all expenses paid.

We live in a time where many environmental problems invite innovative solutions. Yet, the finning industry defies this trend by constantly *increasing* its kills every year. And the reason is simple: there was a time when shark fin soup was an exclusive gourmet item reserved for emperors and the upper echelons in Asia who owned the privilege of ingesting a piece of the almighty shark. As the global economy grows (and not often in the most sustainable fashion), more folks have reached a point in their lives where *they can* afford to eat shark fin soup. It has become a symbol of status where no wedding is complete without it on the menu. Not offering it is interpreted as an unforgiving *faux* pas, as if one's guests weren't worthy of the extra expenditure. However, as it becomes more widely publicized,

the crisis caused by finning is reshaping our minds and habits, so maybe the crisis will eventually become the shark's best friend.

One needs to look at the financial factors that underlie the finning phenomenon to get a better understanding of this destructive practice. Let's take it out to the ocean where it all happens. Imagine your living room is the same size as the cargo hold of a fishing boat and your life's dream was to become a fisherman. You saved and applied for government funding and fulfilled your ambition of owning a vessel. Now you are the captain and you have bills to pay, mouths to feed, children who need clothes and school supplies. Your crew is in the same boat – both literally and figuratively. You go out to the ocean, set your lines, when you come back to check them a few hours later you find sharks in abundance. You were actually wishing for the much higher value swordfish, *Xiphias gladius*, but sharks is what the Gods brought you that day, or maybe you're over your swordfish quota and, afraid you'll get another heavy fine from *the Man* on shore, you've actually decided to hit that one sweet spot where you know sharks abound. As you pull in the catch, your crew carefully stores the sharks in your cargo hold, until it's full. It's time to go home but that's when it hits you: you've got 20 tons of dead sharks, which will sell for 1 euro per kilo, maybe less, back on shore--that's around 20,000 euros, not bad for five days work.

If only you could keep all that money, but there are expenses to consider. You have to put some aside for diesel fuel for your next trip, for your fishing permits, for new lines and that paint job you've been delaying that's causing all your fishermen friends to tease you because your boat is starting to look like a rusty piece of modern sculpture fit for the Guggenheim Museum. It's essential to pull it into dry dock and scrape the barnacles off the bottom because the vessel is using 20 or 30% more diesel from increased friction caused by all the zoological activity happening on your hull. You know you need to do those things before your fishing business goes under. What's wrong with this scenario? Can't you do the

math? What you have is a living room full of dead sharks and the 20,000 euros won't even come close to solving your financial problems. Not after you've paid for all of the above and your crew, who worked hard and have their problems too. The money will vanish faster than you can say, "I need to refinance my mortgage or maybe get a second, or third, or fifth loan."

An awful notion crosses your mind. One you never seriously considered before because you're just not that type of guy. However, the prospect is more than attractive. "What if I get rid of those 20 tons of carcasses and replace them with… fins? Not just the fins from those sharks we caught this week but from *all* the sharks we find. Fins are small and flat, much easier to store than big chunky stumps of shark flesh. Hell, I could fit *fifty tons* of them inside my hold! Moreover, the best part of it all is that I can sell fins for *twenty* or maybe more euros per kilo. Twenty times, fifty thousand…" Your hands shake as you write all the zeros down on a napkin. You made the calculation in your head but you couldn't quite trust the total. It was so high you need to see it with your own eyes. "Twenty times fifty thousand is… *one million*!" What would *you* do?

I dare suggest that very few problems I know of pose a greater challenge to marine conservation than commercial fishing. Conservationists worldwide - and I like to think of myself as one, despite my multiple ties to the commercial fishing sector – cry out for one thing and one thing alone; sell the fins, yes, but don't throw away the carcasses. *In other words, sell only the fins from the sharks that you fish*. It's a very legitimate request and one that will help ensure sharks will be around for our children and their children. However, those with the power to deny it routinely block this request, as reasonable as it is. Moreover, the "No" is never direct. It always comes disguised in that placating but annoying phrase "let's see what we can do" that takes the shape of placid and spineless legislation from which little or no positive action ever results.

Fig 15.3: INSERT CHART HERE WITH STATISTICS THAT SHOW HOW MANY SHARKS ARE KILLED BY FINNING, DEPLETED SPECIES STOCK, ETC. JC to get that from the Shark Alliance.

Such is the case of the European Union's "ban on finning", which prohibits the practice from European waters but allows vessels to apply for a *special permit*, that allows commercial fishermen to have a catch composed of 95% carcasses and 5% fins. And this is *almost* a great victory for conservation, if it weren't for one tiny detail: most sharks' fins weigh *less* than 5% of their total body weight, which means the legislation is in fact allowing fishermen to land fins that belong to sharks, which lie dead in the water after having their fins cut out on deck.

Who gets these special fishing permits? *Everyone*! At least in Portugal, and I have no evidence that it is any different in any other European nation. Forty-five vessels applied for these permits in 2010 and that same number were duly issued. Similar numbers are available for 2011 and 2012. However, remember you're the captain of your boat and *you* decide what to bring back to shore inside your cargo hold. What will you choose: the 20,000 Euros worth of carcasses that leave you hanging, yet again, out to dry with bills you cannot pay or the catch that will gain you one million Euros that's going to solve all your problems but requires you to land those fins illegally somewhere else? Alternatively, maybe you use your special permit to adopt a compromise solution. One, that, while granting you substantially more than 20,000 Euros, allows you to land your catch *legally* on the dock, rather than dumping it straight into a truck in a dark alley. The truck's shipment may eventually be bound for Hong Kong and if you're discovered as a supplier of illegal shark fins, you could end up with a fine that will permanently sink your fishing business. It doesn't take rocket science to figure out which option you would take.

SHARKS AND THEIR IMPORTANCE TO AQUARIA

Other sharks also fall prey to finning but the blues by far suffer the greatest share of mutilation and extermination. In addition to their exquisite slenderness and breath-taking beauty, rescuing them from this brutality, and increasing public awareness of their value and uniqueness is why aquaria worldwide desperately crave the opportunity of displaying them to the public. However, blue sharks specifically, alas, are one of the most notoriously hard species to keep alive in a captive environment. This is the main reason why Mark Smith, a marine biologist colleague, and I decided to jump on a boat and not only try our luck at tagging this elusive and stunning little creature but also in collecting one or two of them for the Open Ocean Exhibit at the Oceanário de Lisboa.

Let me expand on the challenges of maintaining blue sharks alive in captivity. Many of my colleagues in the public aquarium industry have tried and failed. Once restrained in a confined space, blue sharks instinctively hug the walls of an exhibit, no doubt trying to get back to their migratory route and literally moving on with their lives. This behavior leads to erosion of their fins and most often, severe infections, leaving these magnificent creatures prey to bacteria that ultimately win, despite the blue's phenomenal immune system. Why, then, were we attempting to capture blue sharks and harness them for the Oceanário's collection? Was this another foolish human attempt at domesticating that which can't be domesticated?

It was our firm belief that if we were to collect only *juvenile* animals, close to newborns, in fact, they would stand a chance of survival by adapting to a confined environment at an early age. Weighing those odds against the exceptional story that a blue shark can tell in a public aquarium and what we can learn about them, we immediately went for it. By sacrificing two or three young animals—and by "sacrificing" I mean pulling them

from their natural environment while placing them in the richest possible captive scenario – we felt that the sharks held in the Oceanário's main exhibit acted as ambassadors for their species. Moreover, because these captured few represented the dozens of millions of sharks slaughtered needlessly each year, we would be able to tell their story to a broad public, engage people with these animals and deepen their understanding of them. This seemed like a fair trade to us.

TAGGING AND TRACKING

For those sharks much too vulnerable to survive in an aquarium, my work in conservation also includes tagging and tracking their populations globally. The blue shark is a constant traveler and monitoring their journeys is now a networked effort of maritime biologists, aquarists, commercial fishermen and ordinary shark lovers worldwide.

Our own tagging adventure began when we found the "Sea Sunset", a 12 meters long yacht that we chartered from Walter Canelas and his sportsfishing operation. Walter was a former World Champion angler who had taken the title in South Africa many years before when he caught a massive Marlin on his line. I had come to know him in early 2002, weeks before my first tag and release tournament off Sesimbra. Rita Sá and Francisco Leitão, both active members of the Portuguese Elasmobranch Association (check it out at www.apece.pt), called me and said, "We've learned of an amazing guy you just have to meet!"

A few days later, we were all sitting outside the "Mexicana", a friendly coffee shop in Lisbon not far from where I live. Walter explained what he did and how he was a fervent advocate of shark conservation, although he took his struggle to the ocean, while we took it online with our troop rallying, to Brussels in the form of lobbying and to schools while lecturing all over the place about sharks.

On this pleasant afternoon, I received another of those well-earned lessons in humility that egomaniacs such as yours truly deserve now and then. After listening to Walter's cool tales of fights with exotic sea creatures as big as the Loch Ness monster, I ranted on about the scientific advantages of tagging sharks and the phenomenal data that came with recaptures. I detailed for him how I had tagged numerous non-Lemon sharks in 1994 and how we could get as many free tags as we needed from the North American National Marine Fisheries Service cooperative shark-tagging program, (which has been running for decades). Walter smiled and very politely told me "Friend, we've been tagging sharks since before you were born, I know all about the NMFS and how to get tags from them. But thanks anyway."

However, for all you land-dwelling readers and first-time sailors let me humbly explain what shark tagging involves. As mentioned earlier, blue sharks are great ocean-going travelers, logging thousands of kilometers every year. Driven by an internal biomagnetic compass, they migrate in a circular direction from the Caribbean Ocean, across the Atlantic, journeying along routes through the Gulf Stream and up the coast of the USA. They then swim east to Europe, south to Africa and make the return trip to the Caribbean.

The whole process of the shark's voyage may take up to one year, sometimes more, sometimes less. The mechanism by which sharks, and other sea creatures, navigate through the oceans, often not even in contact with the sea floor, is not completely understood. Some claim they rely on the earth's magnetic field while others, such as my good friend Nuno Queiroz, and his advisor, David Sims, believe blue sharks, specifically, swim along the borders that separates different water masses. No doubt, a strategy that allows them to follow those waters that are rich in nutrients and therefore nourishment. The NMFS Cooperative Shark Tagging Program is a collaborative effort between that organization, recreational anglers, biologists and the commercial fishing industry to study the life cycle of Atlantic sharks. The program began almost fifty years ago and now involves thousands of international shark-lovers

from the Atlantic and Gulf coast of North America and Europe. Data from tagged sharks and other species provide marine biologists with valuable information on age, growth, mortality, populations, behavior and the extent of migrations across global seas. Numbered tags are sent to volunteers to record information (date, location, gear, size and sex of shark), along with a tagging needle, instructions, current management information, and shark ID cards. Once tagged, a shark may be recaptured many months later by a commercial boat or a recreational angler. Either way, if the fishermen or volunteers involved are true friends of the species, they'll record and update the shark's current statistics then release it and mail the data back to the NMFS program.

Many folks from various countries are now involved in this initiative. Their participation offers us hope that a wonderful appreciation and empathy for sharks is growing to counter the evil forces of finning. The practical aspects of this noble endeavor start with one tricky undertaking. You have to go get the shark to tag it!

We participated in the first shark tag and release tournament ever done in Portugal, precisely on my 30th birthday, 9 June 2002. The tournament was organized by ZUCA, a sportsfishing club based in Sesimbra, a small fishing town 45 minutes south of Lisbon, now a very touristy place that attracts thousands of visitors every weekend. The tagging event *per se* was preceded by a whole day dedicated to educating observers as to what sharks they were going to see and teaching the fishermen about the practice of using circle hooks, how to safely remove the hook and measure and tag the shark. One of the fishermen was vehemently against it all, exclaiming dismissively that it couldn't be done. Leonor, then my wife, came to my rescue as I explained to him that scientists, volunteers and fishermen from all over the world tagged sharks – big ones too – every single day. The guy wasn't convinced and claimed I was full of hot air. Leonor snapped a finger angrily in front of his nose, "He's

tagged Tiger sharks 4 meters long in the Bahamas, you moron, and my husband doesn't lie!" It was an intense discussion and I eventually asked Jó Pinto, one of the organizers and head of the ZUCA club, to put me as an observer in the reluctant fisherman's boat. It turns out we bobbed up and down in the water all day and caught *nothing*, which was a shame because I was eager to illustrate how one can successfully tag and release an adult shark.

Fig. 13.4 – *Leonor Sousa taught sports fishermen in Sesimbra all about shark biology the day before the first shark tag and release tournament in Portugal, 9 June 2002. The South Africa Pavilion donated the white shark model behind her to the Portuguese Elasmobranch Association during the Expo 98 World's Fair. The APECE later gave it to the Oceanário's Educational Department, although we snagged it to show occasionally whenever we were doing workshops or training sessions on shark biology.*

The evening before the Tournament, Luís Pires, a local businessman who

owned multiple fishing boats that operated as far as South America, took all us youngsters out to eat. He was impressed by the eagerness of the Portuguese Elasmobranch Association to finance students interested in marine sciences and wanted to help in any way possible.

We didn't have much money then Still, we offered students 250 thousand *escudos (*about 125 euros) scholarships every chance we could; a small sum that nevertheless allowed them to participate in research expeditions and gain hands-on experience of marine biologists at work. Check out such awards at www.apece.pt/apece_bolsas.html and the "Research Fund" page of the Flying Sharks website to see what I mean. (Note: The Flying Sharks Company didn't come to be until 2006 and our FS Research Fund was only established in 2008).

Luís's claim was as simple as it was inspiring: he had been living a successful life thanks to the plentiful bounties extracted from the oceans, so he wanted to give back. Between dessert and coffee, he sprang the news: he was going to award the Portuguese Elasmobranch Association 5,000 euros plus a brand new desktop computer. Leonor, Rita, Francisco, and I had definite dropped jaw syndrome at this announcement.

During the tag and release tournament, every boat held one observer assigned to validate the species and size of the animals caught – and released – and report on them to the organizers once they returned to shore at the end of the day. Much of the training we did the day before was directed to these observers, who needed to learn the difference between a blue and a Mako shark, *Isurus oxyrinchus*, which were by far the main candidates to be caught and tagged during this operation. Interestingly, or I should say, *annoyingly*, every single boat during this session tagged at least one blue shark except ours, which was the God's way of preventing me from demonstrating to the suspicious fishermen in my boat that tagging wasn't such a big deal after all.

I must admit I wasn't too upset, though, for Walter Canelas had approached me with a fiendish plan. He believed all the chumming that was to happen during the tag and release

tournament would surely attract many critters, big ones too. He invited me to join him on a night excursion *after* the tournament. "Hell, yes." was my enthusiastic reply as I wondered how was I going to explain to my darling wife that, not only were we to spend my 30th birthday out on the ocean tagging blue sharks, but we'd be doing it also throughout the night. She replied with a nervous "Hmmm… Let's see later, ok?" and I immediately understood the night voyage would be for my enjoyment alone. Leonor's stomach was even less tolerant than my own of the gastric upsets one encounters on the ocean. Vítor Costa, an enthusiastic aquarist from the Oceanário who worked on the Open Ocean team, asked if he could tag along (no pun intended).

The boat was wild that night, as Lima Ferreira, Walter's business partner, had invited a few friends to come as well and they were a bit too loud for Walter's taste. We celebrated my birthday with whisky and Portuguese custard tarts (called *pastéis de nata*) that fine evening. Whisky is not really my cup of tea but I felt that on my 30th birthday I deserved better than water. The guilt I felt from leaving Leonor home alone pushed me towards the Cutty Sark bottle too. Regrettably, the evening passed without so much as a single reel firing up, so we returned to shore at about 6:00 a.m., dismayed and distraught.

THE FINE POINTS OF CHUMMING, BAIT HOOKS AND SHARK CAPTURES

A few months later, David Lopes, one of the Oceanário's C.E.O.s joined me along with Ana Oliveira, head of the marketing department on yet another tagging venture. Again, we played all day and chummed the hell out of the water, but not a single shark graced us with its presence. I managed, however, to bring some of that messy mix, or at least the smell of it, back home with me. I always enjoyed jumping in the clear blue ocean and forgot to reboard the boat using a bowline, which means I crossed the chum that slicked the surface of

the water off the stern. Avoid that, if you can, when going out shark tagging; the stench is a major woman-deterrent and can definitely ruin your social life.

We were hoping that 2003 would bring us better luck at locating Blue sharks. On February 24, Mark and I boarded Walter's boat, the "Sea Sunset", taking with us a round collecting vat 1.1 meters wide. We eagerly watched as Walter set multiple circle hooks out at various depths and dropped a bag of chum in the water. (Preparation of this fiendish mixture was always a highlight of these trips.) It consisted of half-rotten mackerel left in the garage for a few weeks to reach its full odorous shark-attracting potential. When Jorge – a police officer who moonlighted for Walter as his deckhand - opened the plastic drum containing the rancid goop, I remember my eyes rolled back and my nostrils just about imploded! It was one of those rare moments when wished I had become a lawyer instead of a marine biologist.

Walter was a firm advocate of using circle hooks, which are predominantly more humane and lodge in the corner of the shark's mouth, rather than inside the gut, eyes, gills or even skin, as most "J" hooks do. The "J" hook is a traditional hook the shape of its name. It snags just about everything that crosses its path, including fingers and checkered flannel shirts. Once an animal bites the bait around a J hook, the hook will embed in whatever flesh it gets first as soon as the fishermen feels a slight pull on the line and gives it a yank.

Circle hooks, on the other hand, have an extra bend inside and won't catch on anything unless whatever you want to snag is trapped inside the barbell. This greatly minimizes the chances of injuring sharks while fishing, although it seriously increases the difficulty in getting them hooked. The circle hook will snag nothing if the line pulls at the point where the angler feels the shark has taken the bait. The idea is to allow the animal to run with the bait and actually let it swallow it. Only when it's inside the gut will the fisherman slowly apply pressure to the clutch of the reel. The bait slowly leaves the stomach and rises up the gullet to the mouth. The fisherman then gives his rod a firm yank and forces

the circle hook to snag the corner of the shark's jaw, which heals nicely once the hook is removed on the deck. If it sounds hard, trust me, it is. And that's why it was amazing watching Walter in action as he skillfully reeled in a few small blue sharks as if it were nothing.

Fig. 13.5 – *Walter Canelas (left) and João Correia (right) handle a 1.6 meters long Blue shark on deck before pulling the circle hook out of its mouth and introducing it to the transport tank to move it to the Oceanário de Lisboa, 15 July 2003.*

Soon we had two young blues swimming inside the holding tank on Walter's boat. They were around 60 or 70 centimeters long (for the non-metric, that's just over 24 inches). I called the Oceanário to advise we'd be arriving at a different location than we departed from, mostly because we were scared sh#tless of losing the animals, and decided that docking right next to the facility would be less stressful on the sharks.

Fig. 13.6 – *Walter's deckhand (left) and Nuno Queiroz (right) monitor a captive Blue shark while being moved to the Oceanário de Lisboa. Notice the 12 volts submersible pump, in the middle, which helped to dissolve oxygen in the water to a saturation of 200%.*

Miguel Oliveira, our on-land Operations Manager, worked his sweet-talking magic and managed to have the usually fastened dock gate unlocked minutes before we arrived. Soon Mark and I were gently hauling the blues from the holding tank into huge plastic bags, tough enough that the sharks couldn't bite through them. The bags were each loaded with fifty kilos of water plus the shark weight. We then carefully poured both water and animals

into a transfer tank in the back of the van, waved Walter Canelas goodbye and drove the five minutes distance to the Oceanário at high speed.

The little sharks swam ceaselessly inside the tank, which was amazing to behold since blue sharks are infamous for their unwillingness to adapt to captive circumstances. However, being young, small and energetic ensured that these two moved continuously; they demonstrated zero difficulty despite the tank being a tight space. The juvenile blues were destined for the Open Ocean exhibit. Once we had moved them from the tank into the Oceanario's largest exhibition, Marta Couto, an aquarist, and I jumped in the water to protect the little guys during their first time in their new habitat with all its scary predatory inhabitants. These included four 2 meters long (maybe more) Sandbar sharks (*Carcharhinus plumbeus*), two 1 meter long Jewfish (*Epinephelus itajara*), four multiple sized – yet rather large - Potato cods (*Epinephelus tukula*) and one gigantic 1.5 meters long Queensland grouper (*Epinephelus lanceolatus*).

For a couple of sweet hours, Marta and I drifted through the water with the beautiful blue sharks, following their graceful darting flow as they soared around the tank. I was as concerned for them as any parent who had just dropped his kids off at a new school. I feared they were attracting far too much attention by swimming nervously near the surface and hugging the walls, occasionally breaking the water with their peeking snouts. Eventually things seemed calm enough so Marta and I left them in peace to go shower. Minutes later there was a loud thump on the men's locker room…

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