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PROTECT
THE OCEANS

HIGH STAKES

The environmental and social impacts of destructive fishing on the high seas of the Indian Ocean

Purse seiner fishing, Indian Ocean
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Humpback whale, Indian Ocean
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EXECUTIVE SUMMARY

The Indian Ocean is a crucial ecosystem in the race to protect the high seas.[1] From safeguarding marine biodiversity to promoting sustainable, socially responsible fishing, the changes needed to protect the Indian Ocean could pave the way for ocean protection the world over.

The timing has never been more critical. Across the global oceans, fish populations have been decimated by industrial fishing and marine habitats are reeling from the cumulative impacts of overexploitation and climate breakdown. The Indian Ocean is a frontline for these crises. The climate emergency is transforming the region, multiplying the pressures already exerted on wildlife and local communities by the industrial fishing vessels that plunder the high seas. It is estimated that around one third of the assessed fish populations in the Indian Ocean are overfished.[2]

In this report, we will focus on fishing pressure on the high seas of the western Indian Ocean; the threats this industry poses to biodiversity and livelihoods, and the need to transform ocean governance with a Global Ocean Treaty.

The Indian Ocean is the smallest and shallowest of the ocean basins, lying primarily in the southern Hemisphere with a relatively narrow continental shelf.[3] It spreads over almost seventy five million square kilometers, from the southern tip of South Africa to the west coast of Australia. Surrounded by thirty six coastal states and eleven hinterland nations, the combined population of the circumferential land mass represents 30% of humankind.

The region is home to immense biodiversity. It contains 30% of global coral reef cover, 40,000 square kilometers of mangroves, some of the world's largest estuaries, and nine large marine ecosystems.[4],[5]

Yet the region suffers from a multitude of destructive fishing activities. A Greenpeace report on tuna fisheries released in 1993 described how the tuna industry has "been allowed to develop under a philosophy that ocean life is limitless and available without restraint for private profit."[6] The continued development of the global tuna industry, including in the Indian Ocean, over the last three decades has shown that statement to be spot on.

Industrial purse seiners have substantially modified pelagic habitats and some of the Indian Ocean's most important tuna stocks are overfished. Large-scale driftnets, described as "walls of death" and banned by the UN General Assembly 30 years ago, continue to be used extensively, leading to the decimation of whale and dolphin populations, whilst deep sea trawlers drag their gear over highly diverse seamounts. Recently, new fisheries targeting squid—a species which plays a fundamental role in the marine food web—have boomed unchecked.

Well-managed fisheries are critical to the food security of coastal communities around the world, particularly in the Global South. The contribution of fish to food security is staggering: capture fisheries and aquaculture provide three billion people with almost 20% of their average per capita intake of animal protein, whilst a further 1.3 billion people get about 15% of their per capita intake. Further still, people in Bangladesh, Comoros, Indonesia, Maldives and Sri Lanka get more than half of the animal protein in their diets from fish.[7]

Yet despite the region's reliance on seafood, fisheries are being grossly mismanaged by weak institutions and political decisions that disregard long-term conservation and the urgency of the ecological crisis. As a result, many key marine populations are endangered. The concerning trend of declining ocean health in the Indian Ocean is a clear example of how the current mechanisms in place to govern the oceans are broken. That's why it is essential for governments to create a strong Global Ocean Treaty that can prevent harm from extractive activities and put the needs of marine life and coastal communities first. As we approach the final stages of the Treaty negotiations at the United Nations, world leaders have the chance to transform the fate of the high seas, creating tools that can turn back the clock on ocean destruction and resuscitate marine ecosystems, protecting invaluable species and sustaining coastal communities for generations to come.

A FAD deployed in the Indian Ocean
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HIGH SEAS FISHERIES: INEQUITABLE AND UNSUSTAINABLE

Fishing in the Indian Ocean—both in coastal and international waters—accounts for approximately 15% of reported marine catches globally.

Since the 1980s, catches have been growing, particularly in the eastern Indian Ocean where catches of small pelagics, tuna and shrimp have increased.[8] However, it's important to note that data on Indian Ocean fisheries are often inaccurate due to poor monitoring of fishing activities. Most fish stocks have not been well assessed, so figures need to be treated with caution. Therefore, according to the information available, around one third of the assessed fish populations in the Indian Ocean are considered overfished.[9]

On the high seas of the Indian Ocean, the most valuable fisheries target tuna and tuna-like species such as swordfish, marlins and others—species that are critical to the region's marine ecosystems and coastal economies. High seas fisheries also target deep sea fish and, more recently, squid.

Tuna fisheries straddle the waters of coastal countries and the high seas. They are managed through a Regional Fisheries Management Organisation (RFMO) and the Indian Ocean Tuna Commission (IOTC)—where all countries participating in these fisheries, both from the region as well as distant water fishing nations, meet to discuss conservation and management measures. Unfortunately, the lack of an adequate response to overfishing has made clear that the work of the IOTC has been heavily influenced by industrial fishing interests and guided by short-term profits. This has resulted, as this report explores, in a number of key fish populations being seriously impacted by overfishing and destructive fishing.

Another RFMO, the southern Indian Ocean Fisheries Agreement (SIOFA), is responsible for the management of deep sea fisheries in the southern Indian Ocean. Deep sea fisheries are very poorly managed, posing a threat to vulnerable marine ecosystems such as seamounts (see 'The ocean floor in need of protection' on p14). Fisheries targeting squid have rapidly expanded in recent years and, as in many other parts of the world,[10] there is currently no international management organisation overseeing them.

Illegal, Unreported and Unregulated (IUU) fishing is considered a major threat to the ability to manage fisheries resources sustainably in the Indian Ocean, with "monitoring, control and surveillance systems known to be weak and with fisheries governance fragmented across multiple organizations and agreements."[11] IUU fishers operate with disregard for conservation and management measures and do not report their catches, thereby undermining national and regional efforts to manage fisheries sustainably. IUU fishing can lead to the collapse of local fisheries, with small-scale fisheries in developing countries proving particularly vulnerable—threatening livelihoods and exacerbating poverty and food insecurity.[12]

"Despite the region's reliance on seafood, fisheries are being grossly mismanaged by weak institutions and political decisions that disregard long-term conservation and the urgency of the ecological crisis."

However, fish populations are not only impacted by fishing activities. The recent Intergovernmental Panel on Climate Change Special Report on Global Warming of 1.5° C found that catches of tropical tunas, including skipjack and yellowfin tuna, are "projected to have substantially larger [climate change related] impacts (three times or more decrease in catch potential) than the global average", particularly in the western central Pacific Ocean, eastern central Atlantic Ocean and the western Indian Ocean.[13] This could have an obvious negative economic impact on Indian Ocean fishing communities, yet the existing management bodies have failed to consider and act on climate as a threat multiplier for these fish populations.

The importance of tuna fisheries for the region cannot be overstated. In the Maldives, the tuna sector accounts for 67% of total exports and its contribution to the gross domestic product ranged from 4 to 12% from 2008-2018, contributing to around 11% of the labour force and 85% of the total protein consumed by Maldivians. The number of fishers could be as high as 10,832.[14] In the Seychelles, the tuna industry contributed to more than 90% of exports in 2011.[15] In Madagascar, the fishing sector accounted for almost 7% of national gross domestic product, 6.6% of the total exports and supported the livelihoods of 1.5 million people in 2018.[16]

Tuna fisheries on the brink

As a Greenpeace report on tuna fisheries pointed out back in 1993: "The tuna industry is a prime example of the global crisis in fisheries. As such, it has been allowed to develop under a philosophy that ocean life is limitless and available without restraint for private profit."[17] The development of the global tuna industry over the last three decades has proven that statement to be spot on.

The Indian Ocean accounts for approximately 21% of the world's tuna catch, making it the second largest region for tuna fishing.[18, 19] Yet despite the critical importance of tuna to the region's ecosystems and economies, an important number of tuna populations are overfished.

Yellowfin tuna in the Indian Ocean was deemed to be "very close to an overfished state, or already overfished" by the IOTC back in 2008[20] and formally classified as overfished in 2015.[21] Although IOTC parties agreed to a "recovery plan" in 2016,[22] yellowfin tuna populations have shown no signs of recovery. In fact, the IOTC scientific committee identified "the 2018 catch being the largest since 2010 (440,833 MT),"—a fact that tells of the lack of accountability by Indian Ocean fishing fleets. In 2019, the IOTC adopted a new "recovery plan" but it was full of exemptions[23] and did not address some of the fundamental problems, such as the massive use of drifting Fish Aggregating Devices (FADs) in the fishery (see 'FADs have changed the Indian Ocean seascape' on p9).[24]

"Climate change could have an obvious negative economic impact on Indian Ocean fishing communities, yet the existing management bodies have failed to consider and act on climate as a threat multiplier for these fish populations."

These significant flaws left the 2019 recovery plan insufficient, yet the IOTC failed to amend it in 2020. With overfishing of yellowfin tuna continuing (the impact of which falls hardest on small-scale fishing communities in developing coastal States) the IOTC bowed to pressure to convene a special session of the Commission in March 2021. Despite proposals tabled to reduce yellowfin tuna catch and limit the use of FADs, the European Union—serving the interests of industrial fishing companies from France and Spain—blocked the agreement, resulting in a meeting that failed to agree any conservation measures.[25] Despite vocal public advocacy from developing nations in the region, major retailers, small-scale fishing associations and environmental groups, this impasse postpones further discussions until June 2021, effectively giving industrial fleets the green light to continue harming ocean health and coastal livelihoods.

The problems of unsustainable fishing in the Indian Ocean are not limited to yellowfin tuna. Besides yellowfin, the IOTC continues to fail to address the overfishing of other important fish such as bigeye tuna, albacore, striped marlin, blue marlin and others, let alone the dire situation and/or uncertainty around the status of several species of sharks in the region (see 'The plight of sharks' on p10).[26]

Across vessel sizes, gears and countries, governments responsible for managing tuna fisheries have clearly failed to contain capacity and effort within sustainable limits, and to implement legal obligations deriving from international agreements, such as the UN Fish Stocks Agreement.[27] These include the application of the precautionary approach, the assessment of the impacts of fishing on all species (target and associated), on minimising waste and loss of fishing gear, protecting biodiversity, managing fishing capacity, or adopting and enforcing precautionary target and limit reference points.[28]

Through the relentless use of FADs, European-owned purse seine vessels have substantially altered the western Indian Ocean pelagic ecosystem, resulting in the capture of millions of immature tropical tuna (see 'FADs have changed the Indian Ocean seascape' on p9). Pelagic gillnet, or driftnet, fisheries are responsible for a substantial part of the catch and are very unselective, as well as poorly monitored (see 'Greenpeace documents prohibited large-scale driftnets on the high seas' on p12). Longline fishing fleets are responsible for the decline of many shark species (see 'The plight of sharks' on p10), and have been frequently associated with labour and human rights abuses.[29] What's more, longline fleets operating in the region rely heavily on transhipments at sea—a practice that is both difficult to monitor and has been linked to IUU fishing. According to IOTC Secretariat reports, reported at-sea transhipment events increased by 94% from 2014-2018, with the amount of fish reported as transhipped rising by 54% during the same period.[30]

For decades, fishing fleets from a few industrialised countries dominated most tuna fisheries, leaving little or no space for others. More recently, some developing coastal States have started to develop or expand tuna fisheries in both waters under their jurisdiction and beyond, increasing fishing pressure on already fully or over-exploited stocks.[31] These problems won't be solved unless the inequitable and unsustainable allocation of the region's common fish resources is addressed: overfishing must be eliminated while ensuring the rights of developing States are met.

Tuna transhipment in the Indian Ocean
© Jiri Rezac / Greenpeace

It's important then, to stop using almost exclusively historical rights to allocate access to these resources. These rights do not recognise the legitimate aspirations of developing countries to participate in these fisheries. Crucially, every State needs to agree to much stricter conservation measures, more efficient monitoring and data reporting.

The new allocation mechanisms must be based on fair and transparent environmental and social criteria, rewarding those States and operators who comply the most. They must take into account the environmental impacts and social returns of different fleets and practices.[32, 33] Otherwise, beneficial owners from distant water fishing nations will simply transfer their industrial fishing capacity to developing coastal States under different types of arrangements.[34] To ensure effective and equitable implementation, developing States must be granted support to abide by these rules.

The current regime governing the high seas is outdated, ineffective, full of gaps and profoundly unjust. It allows a handful of governments supporting narrow corporate interests to exploit ocean resources, while the majority of nations, including developing coastal and island countries in the Global South whose populations depend heavily on healthy marine ecosystems for food, livelihoods and jobs, are most affected by high seas degradation.

The harmful impact of overfishing on the high seas of the Indian Ocean falls hardest on fishing communities in island and coastal nations like the Maldives, Mauritius, Madagascar and the Seychelles. Their lower-impact small fishing boats are left with empty nets as massive factory ships grab ever more fish from further out at sea. As the assistant director of fisheries at Kenya's agriculture ministry recently told the Guardian: "Kenya, the Maldives and like-minded coastal nations only fish in the Indian Ocean, so if the stocks get depleted we are the ones who suffer, [...] the foreign fishing vessels, like the EU vessels, will move to other oceans, but we won't be able to move – and we will be stuck with no fish."[35]

POLE AND LINE FISHING: SUPPORTING COMMUNITIES AND MARINE LIFE

Skipjack accounts for over half the tuna catch globally. Stocks are not generally overfished but, with the majority of the world's skipjack caught by purse seiners using FADs, it is crucial that these fisheries receive proper scrutiny for their environmental impact (see 'FADs have changed the Indian Ocean seascape' on p9).

Pole and line fishing is inherently more selective than FADs. If conducted properly, it has low bycatch levels and can yield impressive socioeconomic benefits for coastal States.[36] The Maldivian pole and line fishery, for example, is one of the largest coastal fisheries in the Indian Ocean, estimated to account for 18-20% of the total catch of skipjack tuna in the region.[37]

Plus, the demand for sustainable tuna has never been higher, particularly in key markets in Europe, the US and Japan. As such, coastal States could greatly benefit from developing domestic pole and line fisheries. This could generate local jobs, both in the fishery and across the supply chain, whilst creating a sustainable alternative to industrial fishing—provided a strong management regime is in place and there are substantial reductions in other types of fishing.

Pole and line fishing in the Maldives

FADs HAVE CHANGED THE INDIAN OCEAN SEASCAPE

For centuries, fishers have observed that tuna tend to school under floating objects like driftwood. To increase their catches, fishers learned to exploit this behaviour by deploying artificial objects, either anchored or set adrift, to act as beacons for fish.

These days, a drifting Fish Aggregating Device (FAD) is a floating object (anything from a log to a human-made structure) with a buoy and often an echo sounder attached. But whilst effective at luring catch, FAD numbers have made them a highly destructive fishing method. They attract huge numbers of juvenile tuna from all three tropical species (skipjack, yellowfin and bigeye tuna) and cause higher levels of bycatch (species caught unintentionally) than when fishing for free schools of tuna. FADs also contribute to ghost fishing,[38] damage to coral reefs and an increase in fishing capacity in fisheries already operating at overcapacity. Some potential impacts are still poorly understood or remain in discussion, such as the possibility that by drifting with so many FADs, tuna may occupy suboptimal areas and/or reduce school size.[39]

Yet despite these dangers, the number of drifting FADs deployed globally has skyrocketed. While claiming to be amongst the most sustainable fleets in the Indian Ocean, some European-owned purse seiners use hundreds of these FADs at a time, with their companies building specialist support vessels to deploy and retrieve them.

Estimating the number of FADs released into the oceans annually is inherently difficult. A 2015 estimate carried out by The Pew Charitable Trusts estimated that the total number of drifting FADs deployed in 2013 ranged from 81,000 to 121,000.[40] This unchecked growth in FAD deployment has changed tuna pelagic habitats at an unprecedented scale and the Indian Ocean has been no exception.

In 2014, it was estimated that the total number of drifting FADs in the Indian Ocean had increased by about 70% since the early 2000s and could have reached up to 14,000. The annual number of small yellowfin caught under these FADs went from less than four million in 1991 to more than 20 million in 2013.[41] More recently, studies estimate that in the Indian Ocean, the

A FAD deployed in the Indian Ocean
© Pierre Baelen / Greenpeace

number of drifting FADs increased from 2,250 in October 2007 to 10,300 in September 2013, with at least a fourfold increase over that period.[42, 43] Worse still, 9.9% of the FADs that were lost ended up on beaches in Indian Ocean coastal states, resulting in 1,500-2,000 reaching the shores each year. These beached FADs potentially impact sensitive habitat areas, such as the coral reefs of the Maldives, the Chagos Archipelago and the Seychelles.[44]

Concerns over the increasing use of drifting FADs have been in place for well over two decades. French tuna scientists Alain Fonteneau wrote in 2000: "It appears that the present massive use of FADs worldwide is perhaps an unsafe fishing mode, which could produce serious overfishing of many stocks. There is then a consensus that the use of FADs needs to be controlled and limited to sustainable biological levels."[45] Back then, FAD numbers were a fraction of what the tuna industry uses today. However, despite their obvious negative impacts, industry pressure has consistently blocked effective action to curtail the use of FADs. This was seen most recently at the IOTC's special session in March 2021, where distant-water fishing nations blocked agreement on a proposal tabled by Kenya and Sri Lanka, which included a three month FAD closure, halving the maximum amount of FADs allowed for use at any one time and eliminating supply vessels used for FAD deployment.

THE PLIGHT OF SHARKS

The depletion of shark populations globally is a prime example of the deleterious impacts of the global fishing industry. A recent report looking at the global decline of shark and ray populations points to overfishing as the primary cause of their decline. Its authors estimate that "since 1970, the global abundance of oceanic sharks and rays has declined by 71% owing to an 18-fold increase in relative fishing pressure. This depletion has increased the global extinction risk to the point at which three-quarters of the species comprising this functionally important assemblage are threatened with extinction." The study suggests that in the Indian Ocean, sharks have declined steeply since 1970, with an overall decrease of 84.7%. Devil ray abundance has declined by at least 85% in the past 15 years in the south western Indian Ocean.[46]

Yet despite years of observed declines in shark populations, accurate data continues to be missing, as fishing nations fail to record and report their shark catches. The overfishing of sharks is driven by the continued expansion of international trade. Whilst historically, shark fishing was associated with the trade in fins, recently the trade in shark meat has rapidly expanded and other shark products, such as cartilage and oil, all contribute to a market worth almost $1billion a year.[47]

In tuna fisheries, fishing vessels that use longlines are the most responsible for the decline of sharks. A 2019 report combining satellite monitoring of pelagic sharks and longline fishing came to the conclusion that 24% of the mean monthly space used by sharks falls under the footprint of pelagic longline fisheries. This overlap increases up to 76% when it comes to commercially valuable sharks and to 64% when it matches internationally protected species. The study concludes that pelagic sharks have limited refuges from current levels of fishing on the high seas.[48]

Shark catches, both as bycatch and as targeted fisheries, need to be dramatically reduced if we want to see healthy oceans for future generations.[49] The impacts on shark populations are, however, not limited to fisheries occurring on the high seas, and urgent action is needed at all levels, including providing support to coastal communities that may rely on shark fishing. This is particularly important given the major role of very poor countries in shark fishing and trade: "40% of the reported global shark catch comes from seven of the major shark fishing nations with the lowest Human Development Indices, most of which border the Indian Ocean (Indonesia, India, Pakistan, Yemen, and Tanzania). Almost one-third (7/23) of the least developed fishing nations are also major exporters of fins to Hong Kong."[50]

Conservation measures adopted by the IOTC parties to protect sharks are extremely limited and reporting on shark mortality data is poor. Out of seven shark species for which the IOTC scientific committee was asked to provide advice, in only one case (blue sharks) was the committee able to assess the status of the stock. For the other six species,[51] the stock status was deemed to be uncertain and, in most cases, with a comment that "this situation is not expected to improve in the short to medium term."[52] In the case of blue sharks, which make the main catch of some longline fleets in the region, it is advised that "current catches are likely to result in decreasing biomass and making the stock become overfished and subject to overfishing in the near future." However, no catch limits have been agreed for the species.

When it comes to preventing the depletion of shark populations, the performance of the IOTC has been inadequate. This is a common problem with most tuna regional fisheries management organisations, further emphasising the need for a Global Ocean Treaty to prioritise the protection of biodiversity across the high seas.

As in many other ocean areas, the absence of well-managed ocean sanctuaries, where shark juveniles can be fully protected, is worrying, as they could greatly benefit the recovery of their populations.[53] However, there are some promising examples in this regard. After the Maldivian Government decided to create a shark sanctuary in 2010, shark populations were found to increase in the majority of their atolls. This increase in shark numbers has significantly benefited the local economy, with a sharp increase in dive tourism.[54]

"In the Indian Ocean, sharks have declined steeply since 1970, with an overall decrease of 84.7%."

Blue shark caught on a Spanish longliner in the Indian Ocean

GREENPEACE DOCUMENTS PROHIBITED LARGE-SCALE DRIFTNETS

Following years of campaigning by Greenpeace, the use of large-scale driftnets on the high seas,[55] known as "walls of death" for their capacity to indiscriminately kill marine life, was banned by the United Nations General Assembly (UNGA) through resolutions adopted in 1989 and 1991.[56] The ban came into effect on 31 December 1992.

Back then, concerns about the impact of fishing on marine ecosystems were still not widespread and the UNGA ban set a strong precedent that gave hope to many environmental advocates. For the first time, a type of fishing gear was banned not for its impact on the target species, but for its impact on the wider ecosystem and on vulnerable species.

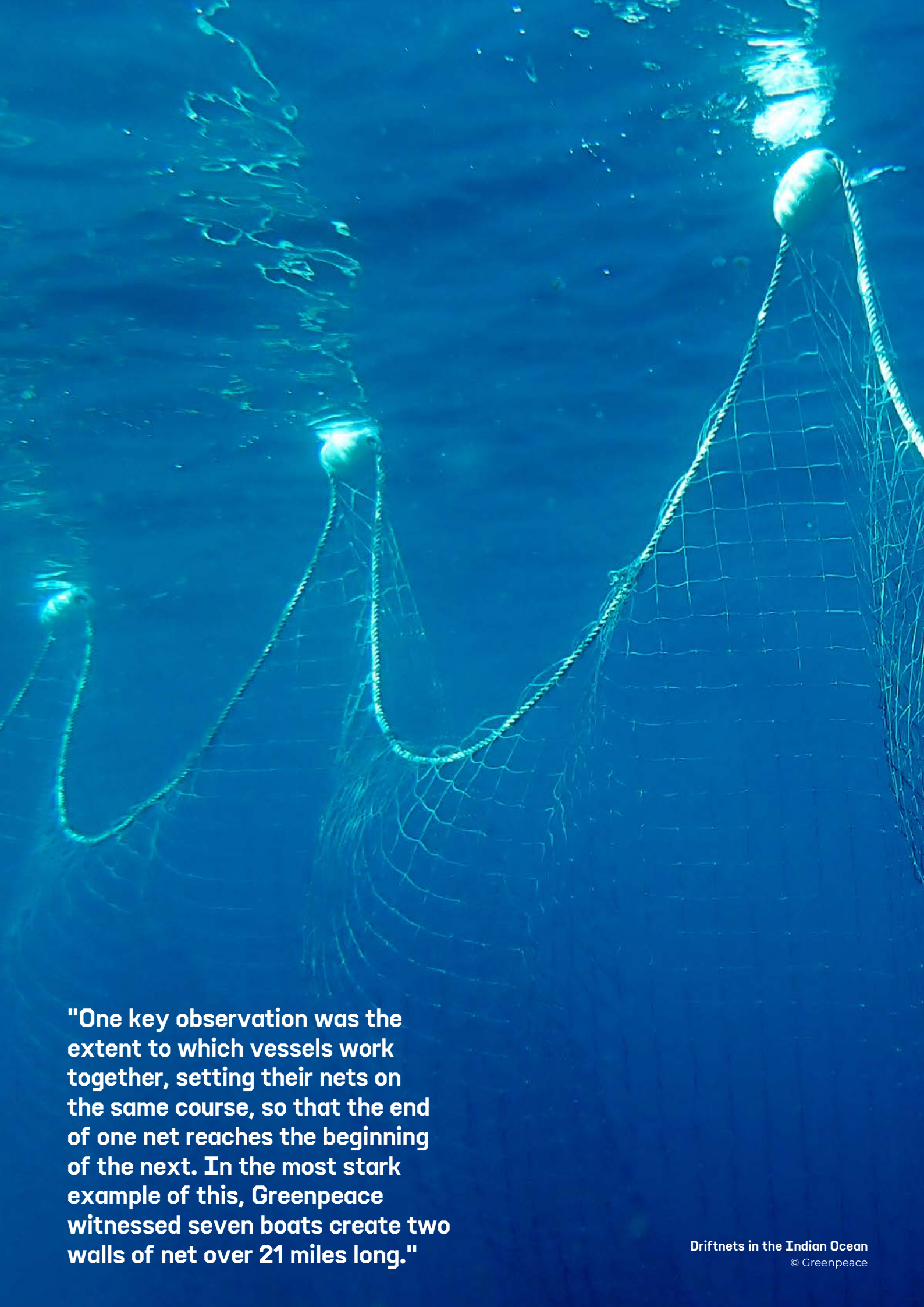
The ban came into place at a time when extensive driftnet fisheries were active around the world. Since States and regional bodies were failing to ensure the sustainability of their fishing activities, the international community stepped in to prohibit large-scale driftnet usage on the high seas. The ban has been subsequently extended to cover national waters in some places—tuna fisheries in particular. In the Indian Ocean, pelagic gillnets (which are driftnets) are still commonly used by some coastal States[57] and account for approximately 34% of Indian Ocean tuna catches.[58] Their use is legal where they are no longer than 2.5km, although even smaller driftnets are known to have high bycatch levels. Despite their widespread use, the monitoring of this gear is very limited and there is scarce quantitative information about their impact.

Yet the impact of these fishing operations on the Indian Ocean biodiversity appears to be massive. A recent study reviewing the impact of driftnet fishing on cetaceans in the Indian Ocean estimated a cumulative total of 4.1 million small cetaceans killed in driftnets between 1950 and 2018.[59] This bycatch was estimated to have peaked at almost 100,000 cetaceans a year during the period 2004-2006, but has declined by over 15% since then—a decrease that could well reflect the sharp reduction in population size.[60]

Over the course of a three week investigation in the northern Indian Ocean in February 2021, the Greenpeace ship MY Arctic Sunrise documented the Iranian driftnet fishery. Their target catch is tuna—both yellowfin and skipjack. Many of these vessels had either turned their Automatic Identification System (AIS) off or were transmitting a weak AIS signal and so not visible on satellite tracking maps.[61] However, after tracking down two of these vessels, within six days Greenpeace had come across a further 25. Every single one of the vessels interviewed was using nets of at least 8km in length and mostly upwards of 11km. There was no attempt to conceal this from Greenpeace which gave us reason to believe that there was no awareness that nets of this length are illegal.[62] We observed five vessels hauling in their catch over as many days, and each of them was using multifilament nets that hung from the surface to a depth of approximately eight metres.

One key observation was the extent to which vessels work together, setting their nets on the same course, so that the end of one net reaches the beginning of the next. In the most stark example of this, Greenpeace witnessed seven boats create two walls of net over 21 miles long. The catch of the vessels varied however, general observations were that all vessels were catching between 1-3 tonnes of tuna per day—the vast majority of which was skipjack, with some other species visible. Bycatch was not high in proportion to tuna catch, although endangered species, including devil rays, were seen far more frequently than expected and it was clear there was no reporting of non-target species taking place. All the unwanted catch was immediately discarded.

This is a seriously underreported fishery and yet it is catching significant amounts of the tuna managed by the relevant RFMO. They have no effective method for documenting the bycatch of vulnerable species, including cetaceans, and so prove yet again the failure of the current governance system to properly manage ecosystems and the critical need for a Global Ocean Treaty.



"One key observation was the extent to which vessels work together, setting their nets on the same course, so that the end of one net reaches the beginning of the next. In the most stark example of this, Greenpeace witnessed seven boats create two walls of net over 21 miles long."

Driftnets in the Indian Ocean

Orange roughy caught by a deep sea trawler
© Roger Grace / Greenpeace

The ocean floor: in need of protection

Deep sea ecosystems are known to be especially vulnerable to fishing and for this reason, deep water corals, sponge fields and other organisms living in the deep sea are considered Vulnerable Marine Ecosystems (VMEs). Deep sea species are usually long-lived, slow to reproduce and cannot withstand high fishing pressure. For these reasons, a lot of deep sea fishing has been described as mining rather than fishing, where high catches made on practically virgin deep sea fish populations have been quickly followed by their depletion.

Most of the Indian Oceans high seas are too deep to be fished. However, there are a number of topographic features at depths between 700 and 1,800 metres where some deep sea fisheries were developed, starting "around 1998 and proceeded very rapidly through a boom-and-bust scenario prior to stabilizing at a low level with a handful of vessels from 2004." However, "catches of alfonsino and deep water sharks have increased between 2014 and 2016, whereas orange roughy catches remained similar."[63]

There are no comprehensive stock assessments agreed for the two main species caught in Indian Ocean deep sea fisheries (alfonsino and orange roughy) due to insufficient data. A recent FAO study looking at the seven species targeted by vessels in these areas identified orange roughy as depleted, whilst the other six species had an unknown status.[64] As one of the longest living species of fish in the ocean, with a particularly late maturity, restoring orange roughy populations presents a serious challenge. That same study states that catches of demersal elasmobranchs (sharks and rays) were "significant in the Indian Ocean and northern Atlantic, but much less fished elsewhere." Deep sea sharks are extremely vulnerable to fishing.

These deep sea fisheries are managed by SIOFA, the regional organisation responsible for the sustainable management of these fisheries and the protection of fragile deep sea ecosystems. Despite a number of resolutions adopted by the UN General Assembly since 2006,[65] SIOFA has done little to protect VMEs. It has adopted five area closures to protect VMEs which are closed to bottom trawl fishing but remain open to bottom longline fishing. Seamounts are crucial hotspots of marine biodiversity and are home to many endemic species.[66] The proportion of seamounts and other underwater features closed to bottom trawl fishing is 3% or less of the area of seamounts at fishable depths in the SIOFA convention area.[67]

The expansion of unregulated fisheries

While urgent action to mitigate the harmful impacts of well-established fisheries operating throughout the Indian Ocean high seas is delayed by governance failings and political inaction, a troubling issue is the recent development of new and completely unregulated fisheries, notably the arrival of a large number of vessels targeting squid.

According to a recent report by the World Wildlife Fund, squid fisheries have rapidly expanded in recent years, with the number of vessels increasing by 830% in just five years, from 30 vessels in 2015 to 279 at the end of 2019.[68] Catches from these fleets are not managed by any international body and therefore not subject to agreed catch limits, time or area closures, or an international monitoring system. This recently developed squid fishery is dominated by Chinese vessels.

> **"The widespread unregulated fishing of squid poses a threat to the entire ecosystem, including vulnerable populations of cetaceans and seabirds which rely on healthy squid populations for sustenance."**

Only a small proportion of global squid fisheries are regulated. In the Atlantic, northern Pacific and Indian Ocean, they are almost entirely unregulated. In 2019, a Greenpeace report[69] exposed the unregulated nature of squid fisheries in the south western Atlantic high seas. With no agreed management measures in place, the area has been inundated with vessels—so much so that at night, their lights make the boundary of the Argentinean Economic Exclusive Zone (EEZ) clearly visible from space.[70] In July and August 2020, a fleet of over 300 mostly Chinese fishing boats was identified fishing near the buffer zone around Ecuador's Galapagos Islands fishing primarily for squid.[71, 72]

In early 2021, Greenpeace spent several days observing a fishery near Yemen from our ship MY Arctic Sunrise. Soon after exiting the country's EEZ, bright lights could be seen on the horizon in several directions. As Greenpeace progressed further into the Indian Ocean, these football-stadium-scale lighting rigs became more numerous. Using AIS maps of the area, well over 100 Chinese fishing vessels, presumed to be catching squid, were counted in the north western Indian Ocean. From the deck of the ship, twenty such vessels could be counted at any one time along the horizon.

The industrialisation of the high seas by this fleet became further evident when vessels were interviewed and observed up close. The fishery used multiple gear types, often with the same vessel switching between using nets and jigging (although Greenpeace only observed nets in use). These nets are a less selective method of fishing, particularly when deployed alongside floodlights which attract a wide variety of species. Fishing throughout the night, one vessel admitted to catching up to six tonnes per night, offloading its catch regularly to refrigerated cargo vessels (known as reefers) which take it back to port. All of this, combined with the sheer scale of this fishery, give great cause for concern.

After all, squid are fundamental to pelagic ecosystems.[73] They are 'nutrient vectors' and play a key role as transient 'biological pumps,' linking spatially distinct marine ecosystems.[74] Indeed, the widespread unregulated fishing of squid poses a threat to the entire ecosystem, including vulnerable populations of cetaceans and seabirds which rely on healthy squid populations for sustenance.

A squid fishing boat in the Indian Ocean
© Paul Hilton / Greenpeace

"An ambitious Global Ocean Treaty, with a formal mandate to deliver the conservation and sustainable use of Biodiversity Beyond National Jurisdiction (BBNJ), would put protection at the heart of ocean governance."

A devil ray caught in gillnets intended for tuna

INDIAN OCEAN AT RISK: HOW A GLOBAL OCEAN TREATY CAN HELP

Fishing in international waters is primarily overseen by various RFMOs. Each of these organisations is supposedly responsible for ensuring that the specific fisheries in their remit are conducted in a sustainable manner and according to the obligations codified in relevant international law—notably the United Nations Fish Stocks Agreement (UNFSA) under the UN Convention on the Law of the Sea (UNCLOS).

But most RFMOs are decades-old international agreements with a track record of ignoring scientific advice on ecosystem health, putting the economic short-term interests of the fishing industry before conservation, and failing to take into account the protection of marine ecosystems that fishing activities rely on. As we have seen in the case of the Indian Ocean, the IOTC and SIOFA are failing to protect marine biodiversity. This has been reflected in the overfishing of key species and the lack of protection for vulnerable habitats and wider marine life—in disregard of scientific advice. Furthermore, there has been a failure to manage fishing capacity and phase-out destructive fishing methods to prevent overfishing and favour coastal fishing communities who use low-impact, small-scale fishing methods.

The recent failure at the Special Session of the IOTC to address the long-term overfishing of yellowfin tuna shows that even when the writing is on the wall, RFMOs are not capable of taking the necessary action to protect marine life. If RFMOs continue to operate by consensus and manage fisheries with a single-species approach, whilst allowing themselves to be dominated by the interests of those historically responsible for overexploitation, marine ecosystems and coastal communities will continue to suffer the consequences.

International cooperation is crucial to avoid overfishing—especially for highly migratory species like yellowfin tuna. RFMOs with mandates for fisheries in the Indian Ocean, like the IOTC and SIOFA, must be fundamentally reformed to have conservation at their core so that they can ensure that fisheries are conducted in an ecologically responsible and socially just manner. New rules and, where needed, institutions, must be put in place to avoid the uncontrolled expansion of fishing on unregulated species, as we are seeing with squid.

In addition to the need to fundamentally reform RFMOs, their siloed mandates and continued failings to protect and restore marine biodiversity mean that urgent political progress to finalise a Global Ocean Treaty is imperative. An ambitious Global Ocean Treaty, with a formal mandate to deliver the conservation and sustainable use of Biodiversity Beyond National Jurisdiction (BBNJ), would put protection at the heart of ocean governance, enabling governments to more effectively address the impact of fishing and other industrial pressures on global ocean ecosystems.

A strong Global Ocean Treaty would empower governments to put in place a representative and well-connected network of marine protected areas, including fully or highly protected areas, for critical habitats, following scientific recommendations and in coordination with, but not delegated to, relevant management bodies such as RFMOs. These could cover nursery, breeding and feeding grounds for fish, as well as migratory routes for sea creatures and blue carbon ecosystems to help climate mitigation. The creation and effective management of a network of ocean sanctuaries across the high seas will increase the protection and resilience of exploited marine species, supporting sustainable livelihoods and food security within the Indian Ocean region and beyond.

Within its provisions, the new Treaty should ensure that human activities, including fishing, are strictly assessed and effectively managed so that the marine environment is afforded comprehensive protection from the cumulative impacts of human activities and climate change. A rigorous Environmental Impact Assessment framework would also ensure that new fisheries, such as the squid fishery, cannot simply emerge out of nowhere without being subjected to further scrutiny.

The Global Ocean Treaty will not replace or undermine RFMOs, but complement and strengthen their work to ensure sustainability and ecosystem health by improving cooperation among the management bodies responsible for the regulation of specific activities on the high seas. The Global Ocean Treaty regime will also support the gathering and sharing of data to help RFMOs to deliver on their conservation obligations, and progress ocean conservation and fisheries management as a whole. By providing scientific expertise and guidance, the Treaty will improve governments' ability, including through RFMOs, to minimise the harm that industrial fishing causes to the wider ocean, and instead act collectively to restore ocean health.

The Global Ocean Treaty also provides a unique opportunity to support greater and more inclusive participation from developing nations in efforts to better understand and protect the global oceans. The high seas are a global public good, yet accessing and benefitting from these waters has been limited to a number of nations and sectors—including industrial fishing fleets—to the detriment of ocean health and coastal communities. If effectively designed, the Global Ocean Treaty can support all countries to participate in and benefit from scientific and technological innovations to conserve the high seas for the benefit of all. This can equip and support researchers and practitioners in the coastal and island nations in the Indian Ocean region to tackle the climate emergency, safeguard food security and rebuild sustainable livelihoods centred on restoring ocean health.

"The high seas are a global public good, yet accessing and benefitting from these waters has been limited to a number of nations and sectors—including industrial fishing fleets—to the detriment of ocean health and coastal communities."

Flying fish at the Saya de Malha Bank
© Tommy Trenchard / Greenpeace

SAYA DE MALHA BANK

In the heart of the Indian Ocean, there is a hidden underwater bank teeming with life. The Saya de Malha Bank is part of the Mascarene Plateau, a continuous shallow ridge connecting the Seychelles in the north to Mauritius and Réunion in the south. It is the largest submerged ocean bank in the world. Analysis of historic fishing data and first-hand observations by Greenpeace ship MY Arctic Sunrise has revealed that industrial fishing vessels using longlines and illegal driftnets frequent the area on a regular basis.

Due to the bank's isolation in the middle of the high seas, studies and observations of this ecosystem are few and far between. However, pygmy blue whales are known to breed in the area, and the deep waters surrounding the bank are rich in nutrients, supporting sperm whales, flying fish and tuna.

The Saya de Malha Bank is also known for supporting the largest seagrass meadow in the world and, therefore, one of the biggest carbon sinks in the ocean. Seagrass meadows account for less than 0.2% of the world's oceans but absorb approximately 10% of the carbon buried in ocean sediment annually.[75] One hectare of seagrass can store up to twice as much carbon as terrestrial forests. By keeping carbon safely locked in the seabed, seagrass meadows help slow climate breakdown. Worldwide, they are critical feeding and breeding grounds to a wealth of wildlife, from dugongs to tiger sharks and a colourful assemblage of fish.

Governments around the world have recognised the Saya de Malha as an Ecologically and Biologically Significant Area (EBSA). The seabed is under shared governance of the Seychelles and Mauritius, while the water flowing through the seagrass meadows is international waters.

DEEP SEA MINING: A NEW THREAT

Adding to existing threats, deep sea mining—the extraction of minerals at great depths in the deep ocean—presents a potential new threat to the Indian Ocean marine ecosystems if commercially developed.

Five exploration contracts in the Indian Ocean's international seabed have been granted by the International Seabed Authority (ISA)—the UN body responsible for managing deep sea mining—to contractors sponsored by the governments of Germany, China, India and South Korea.[76]

If governments allow commercial mining to start in the deep ocean, scientists say this threatens unavoidable harm to ocean ecosystems. Deep sea mining will cause severe and irreversible damage to the oceans, driving further biodiversity loss and risking species extinction.[77]

Mining in the deep ocean would pose an additional climate risk, releasing carbon stored in deep sea sediments and disrupting the natural processes that add to those stores.[78] What's more, fish populations and other marine creatures could be adversely affected by mining-generated noise and light pollution, as well as the discharged sediment from processing ships that could create massive, standing midwater sediment plumes. Impacts experienced from increasing risks to food security will fall disproportionately on communities in developing countries that rely on seafood as their main source of protein. Deep sea mining would also undermine progress towards UN Sustainable Development Goal (SDG) 12, which aims to ensure sustainable consumption and production patterns, as well as SDG 14, which aims to conserve and sustainably use the oceans, seas and marine resources for sustainable development.[79]

A growing number of governments, parliamentarians, fisheries associations and conservationists are calling for a moratorium on deep sea mining, yet mineral exploration of the international seabed continues apace under the management of the ISA. To protect the ocean from overexploitation and the damage caused by the cumulative impacts of human activities, and consistent with the precautionary principle and the ecosystem approach, Greenpeace believes the deep ocean must remain off limits to the mining industry.

Whale shark
© Paul Hilton / Greenpeace

CONCLUSIONS AND RECOMMENDATIONS

The global oceans are facing more pressures now than at any time in human history. Wildlife populations are collapsing,[80] our oceans are heating and their very chemistry is changing at a faster and more extensive scale than ever before.[81] Due to these profound changes, the life support systems that healthy oceans provide for billions of people around the world are breaking down.

Over 80 world leaders have acknowledged that to reverse biodiversity loss within the next decade, "transformative change is needed: we cannot simply carry on as before."[82] As we have detailed in this report, transforming ocean governance is essential to restore ocean health. RFMOs responsible for fisheries on the high seas and migratory fish stocks have been unable to deliver the protection necessary to address the crisis facing our oceans.

There is currently no overarching or comprehensive framework to protect marine life on the high seas, despite the fact that 64% of our oceans lie beyond the national jurisdiction of any one nation. Governments have recognised this gaping hole in ocean governance and are at the final stage of negotiating a new legally-binding agreement under UNCLOS: a Global Ocean Treaty.

This new Global Ocean Treaty can overcome the fragmented and piecemeal approach to ocean governance that has driven marine biodiversity on the high seas into crisis. In particular, the Treaty should pave the way for the creation of a network of fully or highly protected areas covering at least 30% of the oceans by 2030, in line with scientific recommendations.

By improving cooperation between existing fisheries management organisations in the interests of protecting biodiversity and strengthening their ability to deliver on their conservation obligations, the Global Ocean Treaty can help address the harmful impacts of fishing on the high seas and bring in a new focus on conservation and equity that reflects the 21st century challenges of the climate emergency, biodiversity loss, food security and global solidarity.

Governments negotiating the Global Ocean Treaty must ensure it can achieve these goals by agreeing a regime capable of:

- Creating fully or highly protected areas for critical habitats, including critical nursery, breeding and feeding grounds, following scientific recommendations and adopting measures to protect them, in close coordination with, but without delegating to, relevant management bodies including RFMOs.
- Ensuring that human activities are strictly assessed and effectively managed so that highly migratory and straddling species, vulnerable ecosystems and species are comprehensively protected from the cumulative impacts of human activities, climate change and pollution.
- Triggering cooperation across ocean management bodies, including between RFMOs, for the conservation of marine life and ecosystems.
- Providing a platform for regularly addressing issues related to high seas biodiversity conservation in a holistic manner, thus triggering action, for instance through the collection of more and better data and data sharing.
- Providing capacity building and technology transfer that can enable meaningful and equitable partnerships, supported by long-term, easily accessible and reliable funding, for more inclusive and diverse participation of governments, researchers and practitioners from developing nations to collectively protect the global oceans.
- Establishing a robust institutional framework able to take legally binding decisions and supervise implementation as well as streamlined decision making mechanisms, like voting, that would not allow single governments to block progress, as happens in most RFMOs currently.

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Front cover:
Shark caught in a driftnet in the Indian Ocean

Published by Greenpeace International
April 2021
greenpeace.org/30x30

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