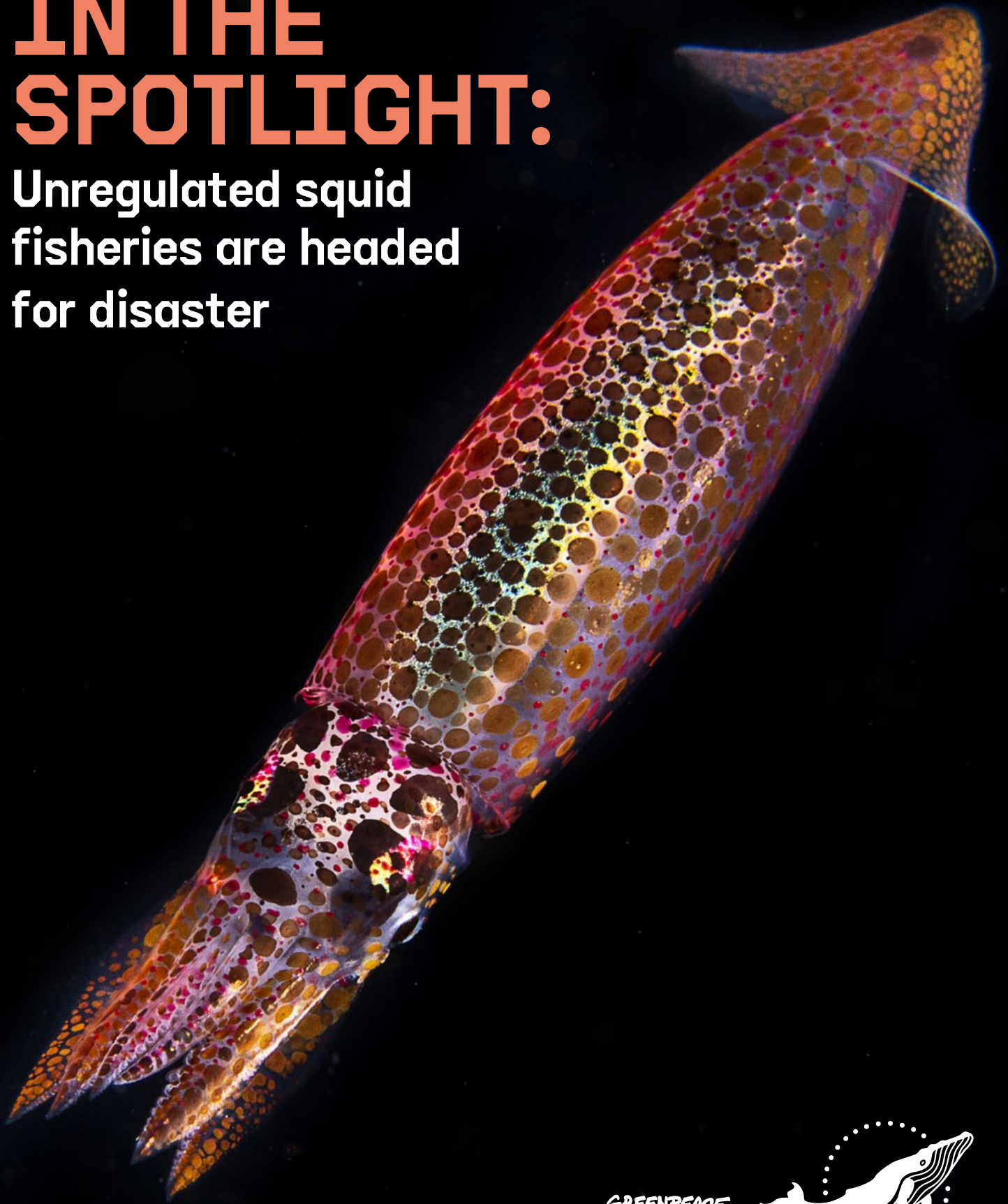


SQUIDS IN THE SPOTLIGHT:

Unregulated squid
fisheries are headed
for disaster



GREENPEACE

PROTECT
THE OCEANS





Transshipment
between a squid
fishing vessel and a
reefer in the North
Indian Ocean

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"Squids are essential to healthy, functioning oceans. As both predator and prey, they sustain entire food webs and perform vital ocean functions."

INTRODUCTION

Last century, after relentless industrial fishing, finfish catches peaked at 130 million tonnes and have been in decline ever since.¹ Now, squids could face the same fate, with unregulated industrial fishing on the high seas decimating these vital species. With a rapid increase in squid fishing occurring despite a lack of adequate data or environmental regulation, it seems the industry has learned nothing from the depletion of finfish populations all those years ago.

This unchecked growth in squid fishing not only impacts the species but the entire marine ecosystem. Squids are essential to healthy, functioning oceans. As both predator and prey, they sustain entire food webs and perform vital ocean functions, such as their ability to transport carbon and nutrients between marine ecosystems, acting as transient ‘biological pumps’.

In the last two years, Greenpeace International has laid bare the insufficient nature of current ocean governance, exposing the ways in which the status quo fails to protect biodiversity on the high seas. We, alongside Greenpeace Germany, have conducted regional studies (South West Atlantic,² Western Indian Ocean),³ sectoral studies (in relation to ghost fishing gear,⁴ transshipments⁵ and deep seabed mining),⁶ and reported on the plight of species that play key roles in marine ecosystems, such as sharks,⁷ turtles⁸ and now squid. These analyses shed a light on the numerous gaps in ocean governance, ranging from fisheries management organisations and conservation agreements, to shipping regulators and flag States.

In this report, we examine the expansion of squid fisheries and look at three regions where this expansion has occurred. We consider the ways in which these fisheries have been allowed to expand with little scrutiny or management rules – even in areas where Regional Fisheries Management Organisations (RFMOs) have a mandate to manage them – and explore why several major squid fisheries have been characterised as unregulated.

The cumulative impacts of climate change, ocean acidification, pollution and overfishing of vital species like squid make it startlingly evident that humankind is modifying marine ecosystems at a scale never before seen in history.

In the face of such unprecedented challenges, it is clear that we need to radically rethink the systems that caused this crisis. Yet governments continue to champion a fragmented and piecemeal approach to ocean protection – a woefully inadequate response that pays no mind to marine wildlife, ecosystems or the billions of people who rely on them.

There is an urgent need for a strong Global Ocean Treaty.⁹ One which ensures that regional and industry bodies take a more holistic approach to the conservation of the high seas. The Treaty must establish modern, comprehensive and transparent Environmental Impact Assessments before expanding any activity that may harm high seas biodiversity, and a global mechanism for establishing fully protected marine protected areas. This is the only way to give struggling marine populations and in turn, entire ecosystems, the time and space they desperately need to recover.

Offloading squid in South Korea
© Paul Hilton / Greenpeace



THE EXPANSION OF GLOBAL SQUID FISHERIES

In the last few decades, the expansion of fisheries targeting squid has been remarkable. Catches of cephalopods (which include squid, octopus and cuttlefishes), has increased almost 10-fold over six decades, from around 0.50 million tonnes annually in 1950 to a peak of 4.85 million tonnes in 2014.¹⁰ In particular, squid catches increased worldwide in this period.^{11 12}

China Mainland, Peru and Indonesia have dominated squid catches in recent years, while South Korea, Japan, Taiwan and Spain had the highest availability of cephalopods for local consumption. However, the expansion of squid catches has not coincided with an expansion of protective measures to prevent overexploitation.

Fisheries targeting cephalopods and invertebrates in general have significantly expanded in recent decades, in stark contrast to declining catches of finfish. While global landings of all marine species peaked in the mid 1990s,¹³ landings of invertebrates continued to mount. This could be an industry response to declining finfish catches, combined with an abundance of invertebrate species due to the decline of predators in the ecosystem.¹⁴

Recent trends show that this rise in cephalopod, and therefore squid, catches is not expected to continue, with evidence of overexploitation of some cephalopod species.¹⁵ Global cephalopod catches seem to have levelled off and have recently experienced important fluctuations. A peak in catches of 4.3 million tonnes in 2007 was followed by a decrease to under 3.5 million tonnes in 2009, peaking again at 4.85 million tonnes in 2014. After that, cephalopod catches fell again to about 3.6 million tonnes in 2017, 2018 and 2019.¹⁶

These fluctuations may partially reflect the natural variability of some cephalopod populations, along with the fact that a significant share of world cephalopod landings relies on a very small number of oceanic squid species.¹⁷ The fall in landings since 2007 was almost entirely attributable to a temporary collapse of the landings of Argentine shortfin squid (*Illex argentinus*). The recovery since 2009 was mainly driven by increased landings of jumbo flying squid (*Dosidicus gigas*) and recovery of the Argentine shortfin squid since 2011. The drop in the world cephalopod catch in 2016, by over 1.1 million tonnes, reflected another 85% drop in the catch of Argentine shortfin squid and reduced landings of jumbo flying squid and Japanese flying squid (*Todarodes pacificus*).¹⁸

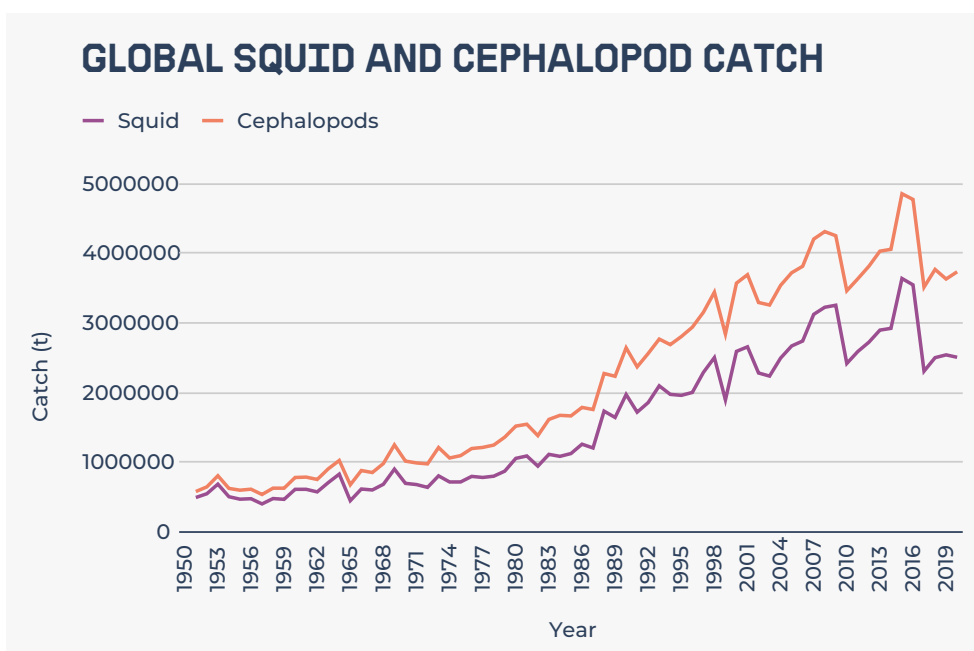


FIGURE 1
Global catches of squid and cephalopods from 1950-2019⁸⁹

TOP SQUID FISHING POWERS

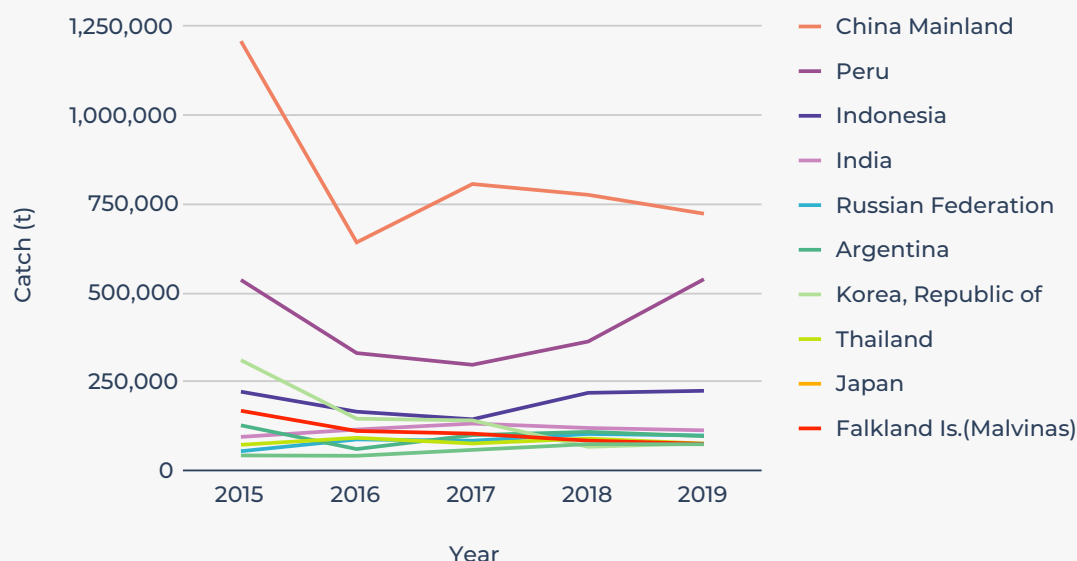


FIGURE 2
The top squid fishing powers from 2015-2019⁹⁰

The Food and Agriculture Organization (FAO) '2020 State of World Fisheries and Aquaculture' report also shows how a few pelagic species, notably squid species, carry a lot of weight in the overall catches of many regions. According to the FAO, in the South East Pacific, sharp declines in catches from over 20 million tonnes in 1994 to between 7 to 10 million tonnes in recent years have been "partially offset" by the significant increase in jumbo flying squid landings. In the North West Pacific, the significant decline over 25 years of Japanese pilchard (*Sardinops melanostictus*) and Alaska pollock (*Theragra chalcogramma*) are "in contrast" with a great increase of squids, cuttlefishes, octopuses and shrimps since 1990. In the Eastern Central Pacific, a large proportion of the landings are small and medium-sized pelagic fish, squids and prawns. In the South West Atlantic, the most important species in the landings are Argentine shortfin squid, representing 10-40% of the region's total catches. However, total landings of this species experienced a sharp drop, from more than 1.0 million tonnes in 2015 to 360,000 tonnes in 2017.¹⁹

Overall, the situation suggests that overexploited finfish species have been substituted with cephalopods and other invertebrates, a trend which may be masking a serious problem of overfishing and flawed fisheries management.

In 2019, the top five fishing powers targeting squid globally were China Mainland, Perú, Indonesia, India and Russia, with China Mainland, Peru and Indonesia accounting for almost 60% of the global squid catch.²⁰ A recent analysis of global trade in cephalopods found that they are one of the fastest growing products in terms of market share in the global seafood trade.

"The situation suggests that overexploited finfish species have been substituted with cephalopods and other invertebrates, a trend which may be masking a serious problem of overfishing and flawed fisheries management."



The jumbo flying squid, or humboldt squid
© Norbert Wu / naturepl.com

According to this research, only three markets (China Mainland, Spain and Japan) led the majority of global market movements between 2000 and 2019. Only eight traders dominated the cephalopod market in Asia (China Mainland, India, South Korea, Thailand and Vietnam), Europe (the Netherlands and Spain), and the USA. In terms of consumption, in 2013, South Korea, Japan, Taiwan and Spain had the highest availability of cephalopods for local consumption.²¹

Despite the expansion of fisheries targeting invertebrates, population assessments and data are often lacking.²² Even though our

understanding of cephalopod biology and ecology in recent decades has improved, many of their populations are not assessed, and some assessments use methods not well adapted to cephalopod life history and ecology.²³ Indeed, recent investigations warn that the increasing percentage of invertebrate fisheries which are being overexploited, collapsed, or closed is “reminiscent of an earlier phase in finfish fisheries during which the rate of finding new fishing areas, new target species, and more efficient gears masked overall catch trends.”²⁴ As such, it is paramount that cephalopod fisheries are effectively monitored and managed to protect them against overfishing.

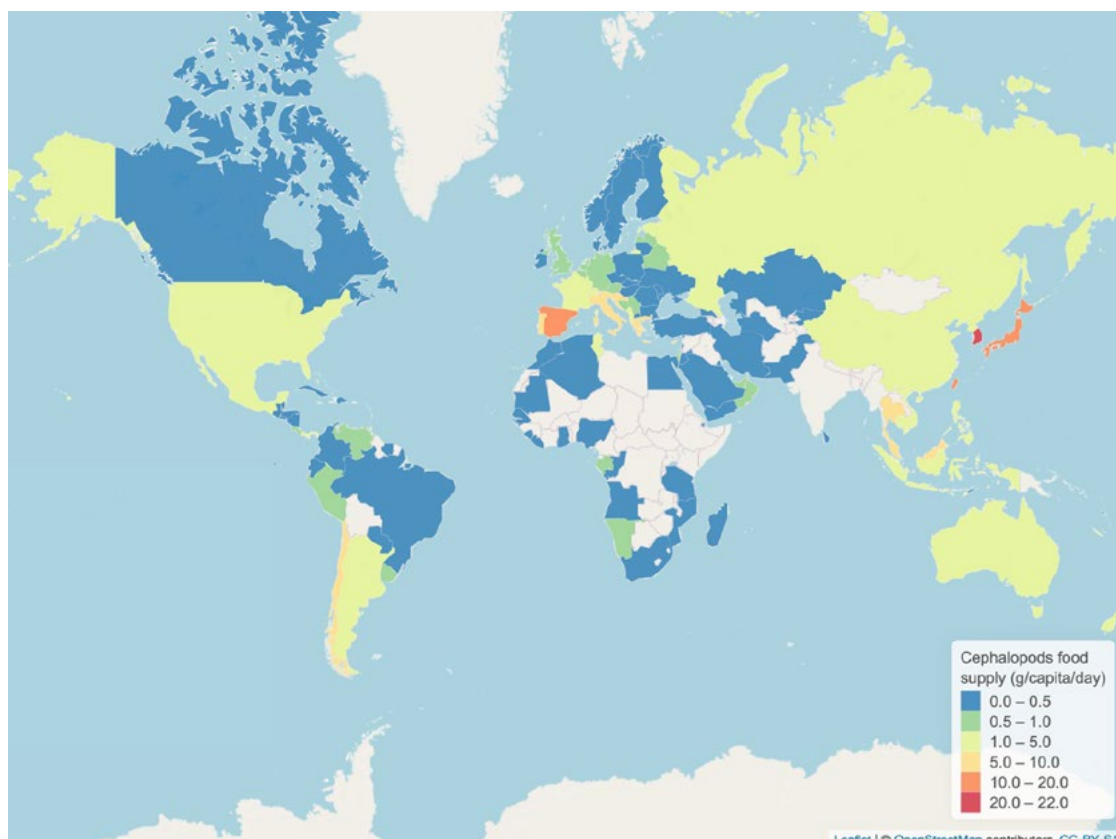


FIGURE 3
Worldwide cephalopod food supply in g/capita/day for 2013⁹¹

"There are currently no specific regulatory and monitoring systems in place to analyse the traceability of the global trade in cephalopods."



A squid vessel
in the North Indian Ocean
© Abbie Trayler-Smith / Greenpeace

MANY SQUID FISHERIES ARE UNREGULATED, PARTICULARLY ON THE HIGH SEAS

Whilst finfish catches are generally regulated, albeit far from perfectly, invertebrate fisheries have expanded “with little scientific scrutiny.”²⁵ In fact, the increase in global fishing effort for cephalopods, notably squid, has been attributed to an increase in large jigging vessels²⁶ operating on the high seas,²⁷ where most of these fisheries are effectively unregulated.

Logic dictates that the expansion of any fishery would require a set of conservation and management measures, including data collection, stock and environmental impact assessments, capacity and effort limits, monitoring and control provisions. However, these measures are often very limited for fisheries targeting invertebrates – a situation which must be urgently improved. Given the important ecological role of these species (see page 17: ‘A vital species: the environmental importance of squid’), fisheries management must seek to avoid harm to and – where necessary – restore these vital marine ecosystems. As researchers have pointed out, “while finfish fisheries and some more established invertebrate fisheries have received increasing assessment, regulation, and rebuilding, many invertebrate fisheries do not get the same level of attention or care.”²⁸

Regulation of fisheries requires good data collection. However, accurate information on squid fisheries is lacking for many regions, particularly regarding fisheries on the high seas. As stated, this is important since the increase in global fishing effort for cephalopods, notably squid, has been attributed to an increase in large jigging vessels fishing on the high seas. These vessels are mainly targeting Argentine shortfin squid, Japanese flying squid, neon flying squid (*Ommastrephes bartramii*) and Gould’s flying squid (*Nototodarus gouldi*), with an increased number of small artisanal boats also catching jumbo flying squid nearshore with hand jigs.²⁹

The management of squid fisheries is rife with technical challenges. Natural fluctuations in squid populations and those forecasted due to environmental changes and the climate crisis make it difficult to define the appropriate type of assessment methods, including data requirements and management measures.^{30, 31} Given their current scale, it is therefore critical that these fisheries are properly managed, in accordance with the precautionary principle, “so they do not face the same fate as many of their longer-lived counterparts.”³² Yet despite growing market demand, researchers focusing on trade found that there are currently no specific regulatory and monitoring systems in place to analyse the traceability of the global trade in cephalopods.³³

The ecosystem and precautionary approaches to fishing are widely endorsed and codified in international law.³⁴ These approaches provide greater consideration for ecosystem structure and function, improving management decisions and therefore the sustainability of marine resources.³⁵ Yet they are poorly applied and fundamentally absent from most existing management measures for squid fisheries, particularly on the high seas. Instead, single-species fisheries management – which largely ignores the impacts of fishing on associated species – continues to dominate.

In fact, in some of the main catching regions, including the high seas, there is no multilateral mechanism to regulate these fisheries (see case studies on the South West Atlantic and the North West Indian Ocean). That means that the management of many squid fisheries, particularly on the high seas, conforms to the definition of ‘unregulated fishing’ in the FAO’s ‘International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing’.³⁶

CASE STUDIES

Only a small proportion of global squid fisheries are regulated. Two recent Greenpeace reports^{37, 38} exposed the unregulated nature of squid fisheries on the high seas of the South West Atlantic and the North West Indian Ocean.

With no agreed multilateral management measures in place, these areas have seen high increases in the numbers of vessels operating there, with unknown impacts on marine ecosystems. In the South East Pacific, the existence of a RFMO has not resulted in measures capable of ensuring the protection of marine ecosystems from overfishing.

SOUTH WEST ATLANTIC

One of the most heavily exploited marine populations in the South West Atlantic is the Argentine shortfin squid, a neritic-oceanic species and one of the largest squid fisheries in the world.

Argentine shortfin squid plays an important ecological role and has an extensive distribution and migration, straddling the waters of Argentina, the Malvinas/Falkland Islands and into the high seas. There are no multilateral management measures in place to prevent the overexploitation of this species and the conservation of marine ecosystems.

Catches of squids in the South West Atlantic rose from 1970 until 1999, after which point there were important fluctuations. Most recently, catches reportedly peaked in 2015 at 1,011,330 tonnes, followed by a sharp decrease to 249,260

tonnes in 2019.³⁹ This boom and bust cycle partly reflects the high natural fluctuations of these populations.⁴⁰ After all, recruitment in squid populations is influenced by oceanographic conditions and climate change which is likely to drive more variability within the environment. Researchers suggest that dramatic declines in these populations, with consequences in associated and dependent species, “could be potentially avoided by considering environmental factors in the development of management strategies for increasingly targeted squid stocks.”⁴¹ It seems clear that in the absence of an appropriate management framework, there is no way to deal with these fluctuations, let alone effectively prevent overfishing. This instability, when coupled with climate change as a threat multiplier, should be of utmost concern for any nations dependent on the cephalopod market.

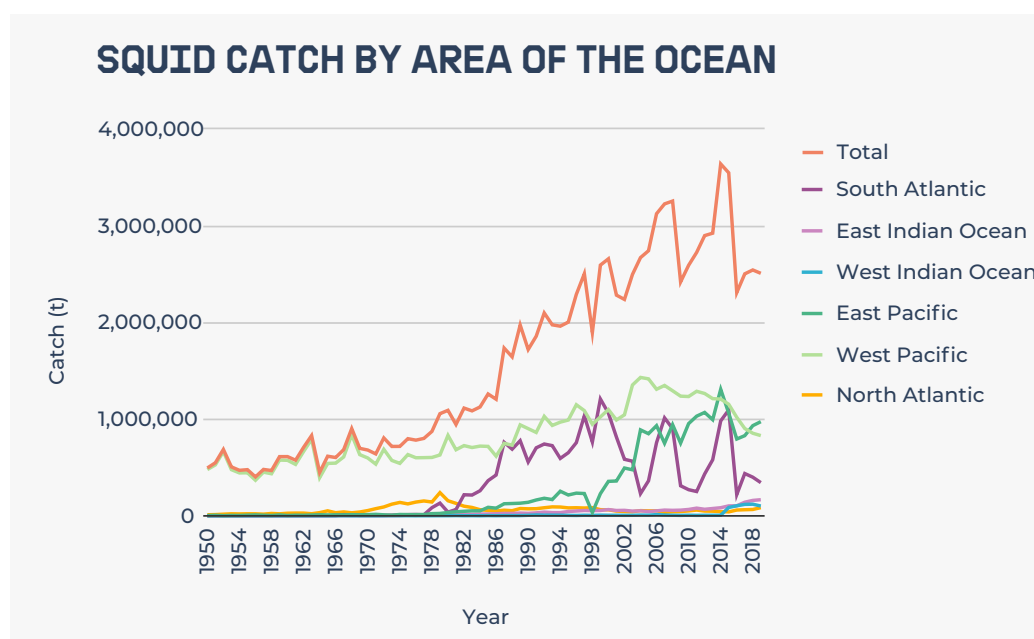
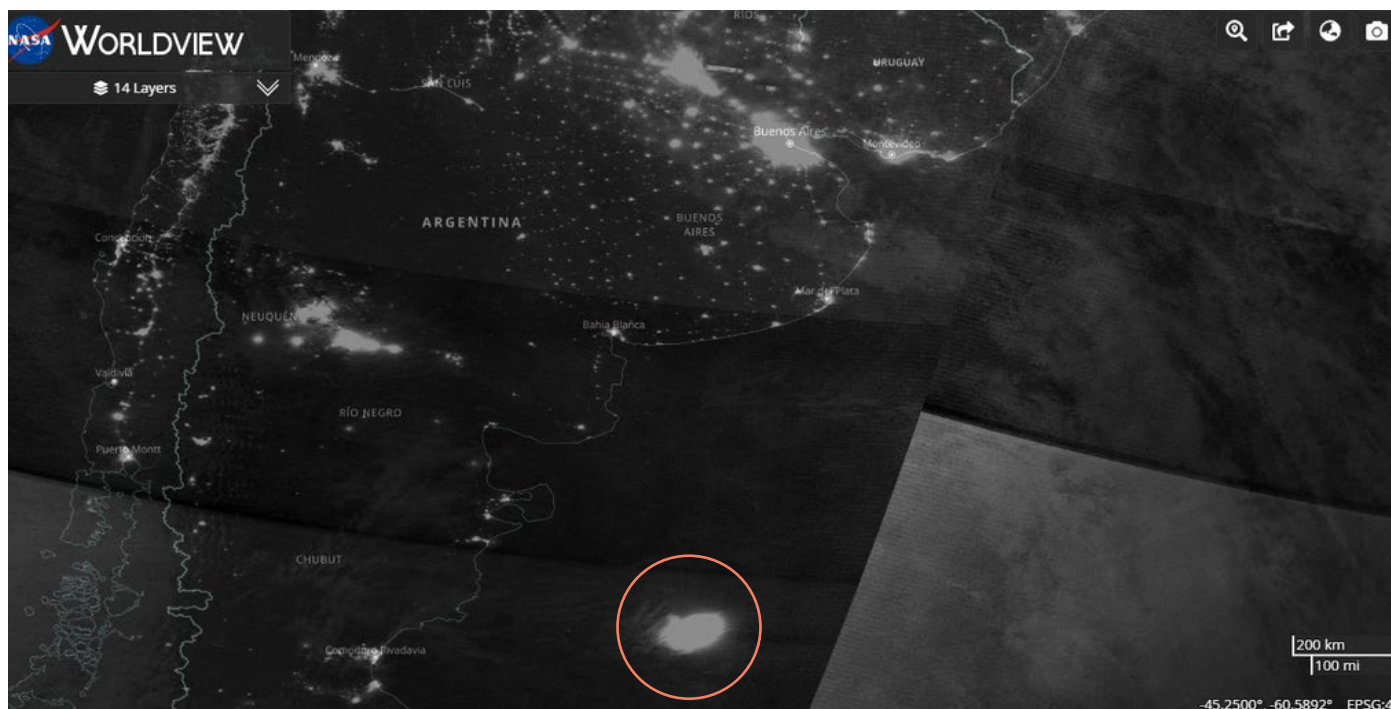
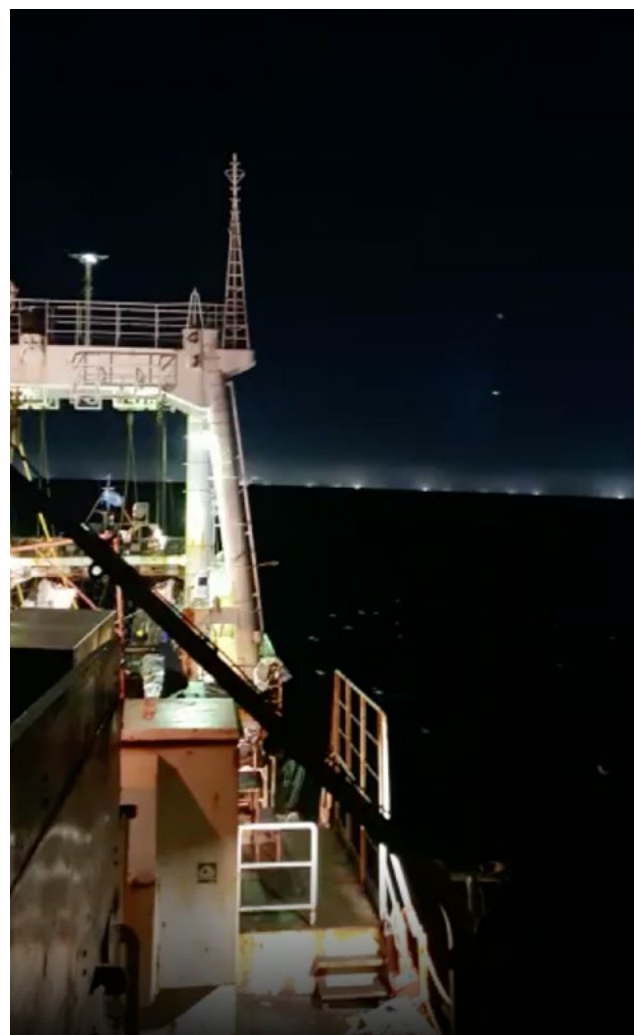


FIGURE 4
Squid catch by area
of the ocean from 1950-2018³²



Above: A satellite image of the Blue Hole, showing the concentration of fishing vessels in January 2022 (orange circle) © NASA Worldview

Below: View of squid vessels from onboard a boat in the Blue Hole © Greenpeace



Argentine shortfin squid, among other species, has attracted a substantial international fleet. In 2019, Greenpeace estimated that from January to July, the number of fishing vessels in the Blue Hole – an area of the high seas located some 500km east of the Gulf of San Jorge, in the Argentinean Patagonia – exceeded 400 during peak squid fishing season.⁴² The Argentinean government identified 546 foreign vessels operating off its Exclusive Economic Zone (EEZ) during the 2020-21 fishing season, of which 379 were squid jiggers and 81 were bottom trawlers, which also catch squid.⁴³ Indeed, the concentration of squid jiggers was so substantial that at night, the lights onboard the vessels rendered the border of the Argentinean EEZ clearly visible from space.

The fact that this squid fishery straddles the waters of Argentina, the Malvinas/Falkland Islands and into the high seas is a critical issue for its management. As well as being targeted in the EEZs of Argentina and the Malvinas/Falkland Islands, it has been estimated that between 11% and 35% of the shortfin squid stock is concentrated in the area over the Patagonian shelf and slope on the high seas,⁴⁴ an area outside national jurisdictions. This shows just how important it is to ensure that coordinated, compatible measures are put in place across the range of the population.

Yet fishing vessels targeting squid in the region are subject to practically no regulation, limited only to those enforced by flag States.⁴⁵ This absence of multilateral rules, combined with dwindling resources that increase the demand on marine life, is a recipe for disaster.

This absence also makes it difficult to assess the level of fishing capacity and effort in the fishery; to determine the impacts of fishing or introduce effective monitoring, control and surveillance provisions. Recent global analysis shows that the area is a hotspot for transshipment activities, particularly given the large squid fleets present.⁴⁶ Distant water fishing vessels are known to turn off their Automatic Identification System (AIS) and enter Argentinean waters illegally. What's more, there is a strong symbiotic relationship between labour abuses and IUU fishing. Where there is weak regulation and poor enforcement, sustainability and human rights inevitably suffer.⁴⁷

During the 1990s, the Argentinean and British governments created the South Atlantic Fisheries Commission (SAFC) to promote conservation and determine allocation quotas of straddling populations of fish and squid. The SAFC didn't result in an effective management regime and the meetings were discontinued. In any case, such a bilateral commission would not have the ability to prevent overfishing unless a multilateral cooperation mechanism was established, including fleets fishing in international waters. Now, even bilateral initiatives have reached an impasse, leaving valuable species and ecosystems completely vulnerable to overfishing.

THE EAST PACIFIC

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The fishery targeting jumbo flying squid in the East Pacific, which ranges from the Southern coasts of the United States to Chile and the adjacent high seas, is one of the largest fisheries in the world and the largest invertebrate fishery.⁴⁸

The number of vessels targeting squid has seen a sharp increase in recent years. Unlike other unregulated squid fisheries, the high seas portion of this fishery is under the purview of the South Pacific Regional Fisheries Management Organization (SPRFMO). However, this has done little to protect the fishery, with the organisation failing to exert an effective control of the fishery or prevent mounting fishing effort on regional squid populations.

Although the population structure of jumbo flying squid in the East Pacific is not well known, it is a widely distributed population straddling the EEZs of several countries and the high seas.⁴⁹ There are well established fisheries targeting jumbo flying squid, both artisanal and industrial, in the jurisdictional waters of Peru, Chile and Ecuador, as well as on the high seas, where vessels predominately flagged to China Mainland, Korea and Taiwan operate. The SPRFMO – a multilateral body involving the presence of 18 participants⁵⁰ is responsible for the management of these fisheries on the high seas. Its members have a clear mandate to establish measures for the high seas and ensure those adopted for areas under their respective national jurisdictions are “compatible in order to ensure conservation and management of straddling fishery resources in their entirety.”⁵¹



Artisanal fishing boats in Peru © Getty Images

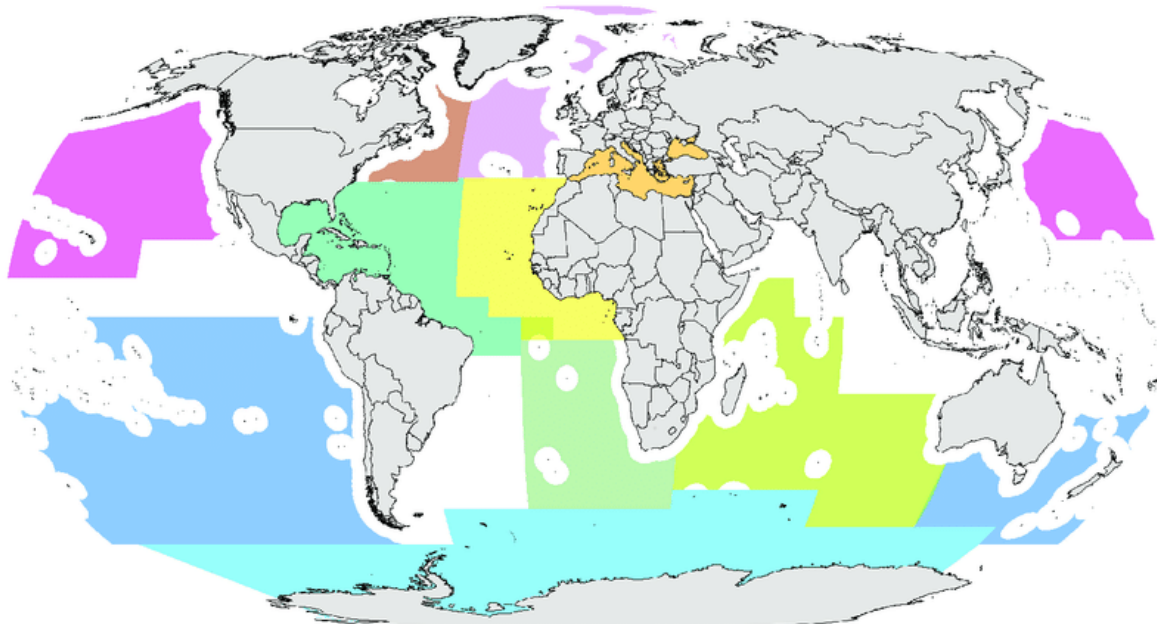


FIGURE 5

Area of competence for each RFMO
© Frontiers in Marine Science⁹³

CCAMLR	GFCM	NEAFC	SEAFO	SPRFMO
CECAF	NAFO	NPFC	SIOFA	WECAFC

The inability of SPRFMO members to establish an adequate management framework⁵² to ensure the sustainability of this fishery is a matter of grave concern. Particularly if we take into account that, according to estimations by Global Fishing Watch (GFW),⁵³ the squid fleet may represent 74% of the total vessels registered to SPRFMO, making it arguably one of its core businesses.⁵⁴

In 2020, there were 587 vessels considered active in the SPRFMO Convention area, mostly flagged to China Mainland.⁵⁵ This is a substantial increase from the 257 vessels considered active in 2015.⁵⁶ The total fishing days have also increased greatly, almost doubling in the last five years.

However, this has not been translated into proportionally higher catches. For instance, the number of fishing days reported to the SPRFMO Secretariat went from 60,883 fishing days active in 2015, compared to 120,335 days in 2020, while reported catches went from 337,971 tonnes to an estimated 361,090 tonnes in the same period. In 2019, the catches of jumbo flying squid reported to the SPRFMO Secretariat by coastal States (Peru, Chile and Ecuador) were 586,692 tonnes, compared to 313,333 tonnes taken by distant water fishing fleets (China Mainland, Korea and Taiwan). Of these, Peru (526,900 tonnes) and China Mainland (305,670 tonnes) were by far the major fleets, jointly accounting for 92.5% of the reported catch.⁵⁷

The actual level of fishing activity may be higher than official figures. According to an analysis by GFW, 615 squid fishing vessels were active in the region in 2020,⁵⁸ compared to a total of 587 vessels estimated by the SPRFMO Secretariat.⁵⁹ In the GFW analysis, over 10% of the vessels identified as active by AIS could not be matched to the official list. Greenpeace's at-sea investigations have consistently revealed the widespread discrepancies between AIS signals and the vessels observed.

The adequacy of effective monitoring, control and management measures (or lack thereof) specific to the fishery needs to be addressed. In 2020, GFW identified a total of 41 carrier vessels active in the area – a figure far greater than the number reported on the SPRFMO Active List that year, which was 12.⁶⁰ This indicates a serious risk of unreported catches. Tellingly, AIS misuse has been verified in the SPRFMO area, with 13% of the fleet exhibiting AIS irregularities that obscured vessel identity and location. In addition, observer levels are clearly insufficient to ensure an adequate data collection and sampling in the fishery.⁶¹

It is troubling that the problems associated with the expansion of this squid fishery in recent years and the absence of adequate regulatory measures is well known to SPRFMO members. So much so that in 2018, an independent performance review⁶² conducted by the SPRFMO clearly exhibited the management flaws in the flying jumbo squid fishery. The review urged the

Commission to act swiftly to address a number of issues, including data collection, the adoption of a specific and comprehensive conservation and management measure, as well as put in place “precautionary measures until sufficient information is available to undertake a reliable stock assessment.”^{63, 64} A number of respondents to the questionnaire conducted by the review panel “expressed concern about the lack of management decisions for the Jumbo flying squid fishery” and “highlighted the fact that this was the largest fishery in the Convention Area, yet no fisheries management decisions had been taken and there were serious gaps in the provision and collection of fisheries, biological and environmental data on this fishery.”⁶⁵

It was not until 2020 that the SPRFMO introduced its first Conservation and Management Measure (CMM) related to the management of the squid.⁶⁶ However, this failed to address some of the main problems in the fishery, in particular capacity and effort management, catch limits and more strict control provisions. The SPRFMO held its 10th Commission Meeting on 24-28 January 2022, where parties again failed to improve the management of this important fishery.

In summary, the flying jumbo squid fishery on the high seas of the East Pacific Ocean provides a clear case of fishery expansion in the absence of adequate information and management measures. Furthermore, it represents a failure to implement relevant provisions in international law by an RFMO, such as the precautionary approach, or to even act upon the recommendations of its own performance review panel.

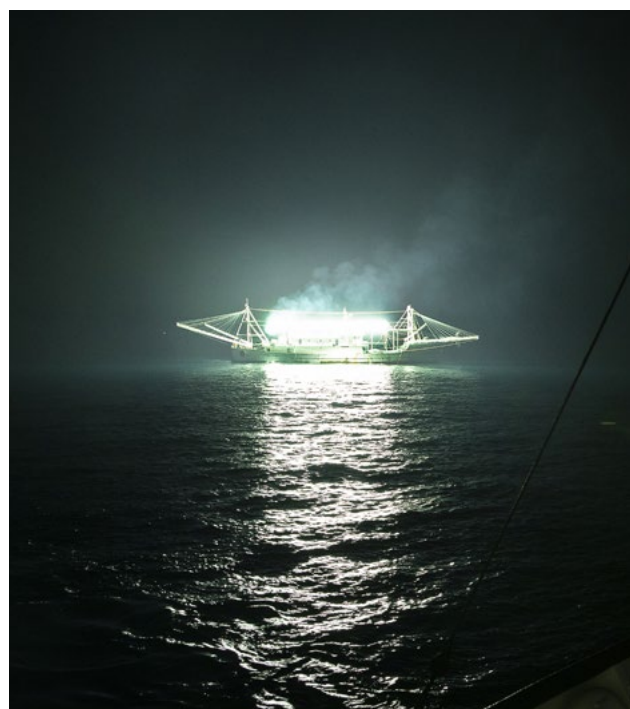
NORTH WEST INDIAN OCEAN

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In recent years, a new squid fishery has developed on the high seas of the North West Indian Ocean, off the EEZs of Yemen and Oman. There is currently no regional fisheries body overseeing this fishery, with no agreed conservation and management measures, monitoring, control and surveillance provisions. What’s more, no data is publicly available about the status of these squid populations or the precise number and type of vessels targeting them.

Throughout the Indian Ocean high seas, urgent action to mitigate the harmful impacts of well-established fisheries, such as those targeting tuna, has been delayed by governance failings and political inaction. As such, the development of new and completely unregulated squid fisheries is seriously troubling.⁶⁷

According to a report by the World Wildlife Fund (WWF), 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 In 2020, monitoring of the fishery conducted by Greenpeace and Trygg Mat Tracking⁶⁹ indicates that squid fishing operations in the region have continued to expand significantly.⁷⁰



Lights from a squid vessel in the North Indian Ocean
© Abbie Trayler-Smith / Greenpeace

INDIAN OCEAN SQUID CATCH

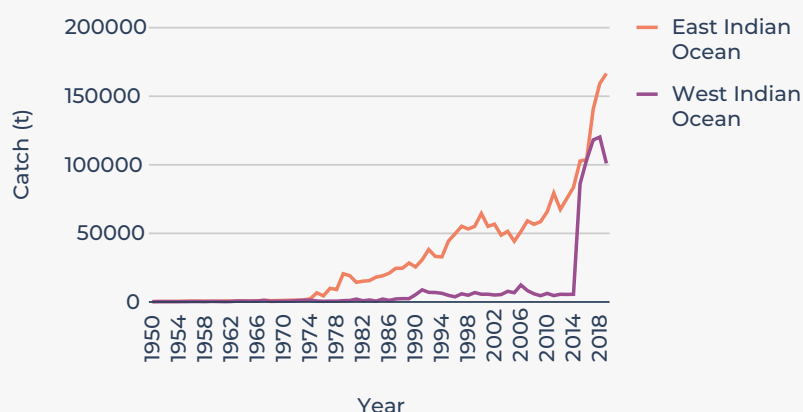


FIGURE 6
Squid catch in the Indian Ocean from 1950-2018³⁴

As is the case with squid fisheries in the South West Atlantic, no squid fishing on the high seas of the Indian Ocean falls within the area of competence of any RFMO, as neither the Indian Ocean Tuna Commission nor the South Indian Ocean Fisheries Commission have a mandate to manage squid fisheries. Catches from these fleets are therefore not managed by any international body and not subject to agreed catch limits, time or area closures, or an international monitoring, control and surveillance system. The squid fisheries in the high seas of this region are therefore effectively unregulated.


In early 2021, Greenpeace spent several days observing the 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 gear used by vessels targeting squid in this region is also becoming a matter of concern. Our at-sea documentation found that in early 2021, all fishing vessels present in the fishing ground were using nets rather than jigs, although some officers did identify their vessels as jiggers over ship radio communications. The absence of jiggers may relate to the timing of the documentation⁷¹ but an increasing use of nets is concerning as they are less selective and

more intensive than jigging, particularly when deployed alongside floodlights which attract a wide variety of species – including tuna and small pelagic fish.

As in the South West Atlantic, recent analysis has identified a cluster of transshipment activity on the high seas which has been linked to a squid fishery.⁷² In this region, the level of AIS transmission is very low, with a significant number of vessels switching AIS off or transmitting intermittently whilst on the fishing ground, providing limited vessel identifier information transmitted over AIS.⁷³ This makes monitoring of the fleet particularly challenging and the precise number of transshipments at sea uncertain. The levels of squid catches are not clear in this area. According to industry estimates, in 2019 the catch may have exceeded 100,000 tonnes.⁷⁴ However, the FAO database contradicts this, not recording any data for the relevant area. This irregular data reporting is incompatible with meaningful fisheries management.

The fishery is almost exclusively composed of Chinese vessels. China has recently started to implement measures to address the management of its squid fleet on the high seas,⁷⁵ and issued two Ministerial Circulars in 2020 and 2021 in light of “crowded fishing grounds on the high seas, low single-vessel output, declining market prices, and reduced corporate profits.” Although this represents an opportunity to strengthen the management and regulation of this fishery, there are no guarantees. With only one flag State involved (at least on the high seas),⁷⁶ other participants could join the fishery or coastal States could develop their own squid fisheries – be it in their waters or in the adjacent high seas.



"Widespread unregulated fishing of squid poses a threat to the entire ecosystem, including vulnerable populations of cetaceans, seabirds and commercial fisheries which rely on healthy squid populations for sustenance."

Humbolt squid at night, East Pacific Ocean
© Franco Banfi / naturepl.com

A VITAL SPECIES: THE ENVIRONMENTAL IMPORTANCE OF SQUID

The expansion of squid fisheries and resulting demand for this species has “no historical precedent.”⁷⁷ Nor has this expansion taken into account the vital role squids play in the functioning of marine ecosystems. As such, this rapid expansion and, in some cases serial depletion, of global invertebrate fisheries may have grave environmental consequences.⁷⁸

Squid species are short-lived, semelparous⁷⁹ and fast growing, with high feeding rates. They have high reproductive rates and are sensitive to ecological changes, thriving in favourable conditions but quickly deteriorating in poor ones. Year to year, their abundance may be highly variable.⁸⁰

As established, higher catches of squid reflect the expansion of fishing fleets. However, the abundance and availability of many invertebrates may have also increased due to the decline of predators in the ecosystem, caused by overfishing of other species and changes in the marine environment, such as ocean warming. Recent analyses have concluded that globally, cephalopod populations have increased over the last six decades.⁸¹ But this growth does not make squids impervious to human activity in the future.⁸²

The importance of cephalopods in sustaining marine ecosystems cannot be overstated. Worldwide, they are a key component of food webs, providing a major prey source for coveted fish species like tunas and salmon, cetaceans like dolphins, sea lions and whales, and a variety of seabirds. In the South West Atlantic, cephalopods are estimated to account for 38% of fish prey, including for key species like hake which are the mainstay of other local fisheries.⁸³

Squid are also predators themselves that make long migrations over their lifecycle. They are responsible for moving large amounts of biomass (i.e. the fish, crustaceans and plankton they consume), including carbon and nutrients,

from one area of ocean to another (e.g. the twilight zone to the ocean surface), acting as transient ‘biological pumps’. They may also be keystone species on which entire ecosystems directly and indirectly depend.^{84, 85, 86} As such, overfishing of squid poses a serious threat to the entire ecosystem, including vulnerable populations of whales and dolphins.

Although squids are sensitive to environmental changes, populations are resilient and can recover from a decrease in their numbers. However, when heavy fishing pressure coincides with poor environmental conditions, a critical tipping point is reached, potentially disrupting the entire food chain. If populations fall below certain levels, this could have catastrophic ecological and economic consequences.⁸⁷

Given the vital role cephalopods play in the marine ecosystem, it is clear that cephalopod fisheries should be managed in a sustainable manner, preferably in the context of ecosystem-based fishery management. Widespread unregulated fishing of squid poses a threat to the entire ecosystem, including vulnerable populations of cetaceans, seabirds and commercial fisheries which rely on healthy squid populations for sustenance.



A STRONG GLOBAL OCEAN TREATY: STATUS QUO ON THE HIGH SEAS IS NOT AN OPTION

The relentless expansion of squid fisheries, particularly on the high seas, is a prime example of industrial activity impacting biodiversity when it is allowed to operate with impunity.

This year, governments will reach the final stage of negotiations for a new Global Ocean Treaty, defining the terms for protection of biodiversity in areas beyond national jurisdiction (ABNJs). Governments must ensure that the final text provides a strong Treaty, with comprehensive environmental obligations – particularly on environmental and strategic impacts assessments – and the power to establish fully or highly protected areas that allow marine life to recover.

It is of paramount importance that no human activities or sectors, including fishing, are excluded from the scope of the Treaty. These negotiations represent an historic opportunity to change ocean governance. There has never been a more pressing time to move away from a system primarily geared towards short-term rights for ocean exploitation, to one where governments are held accountable for marine conservation and the sustainable extraction of marine resources.

Currently, there is no effective mechanism for the protection of ABNJs. A strong Treaty could rectify this, placing conservation at the heart of ocean governance. That's why Greenpeace, together with scientists, civil society organisations, businesses and a growing number of political leaders, is calling on governments to agree to a strong Global Ocean Treaty that can help deal with both the lack of holistic management of the high seas, as well as provide protection to the incredible wildlife that lives there.

In the case of squid fisheries, the solutions are not immediate or simple due to the sheer size of the fleets targeting squid. A range of options have been suggested to address

their management on the high seas, from the creation of a global management organisation to govern squid fishing globally, to the expansion of the mandate of existing regional bodies so as to include squid and other invertebrate fisheries. In some cases, the prospects for establishing regional bodies with the competence to manage these fisheries effectively are low, as in the South West Atlantic or the Western Indian Ocean. As we have seen with the SPRFMO, the existence of an RFMO with the competence to manage a squid fishery is not a guarantee of effective biodiversity protection. RFMOs with mandates for these fisheries must be fundamentally reformed to have conservation at their core. And while none of the options suggested seem to provide an effective solution, international cooperation remains crucial to avoid overfishing – especially for straddling populations like oceanic squid species.

"Governments must ensure that the final text provides a strong Treaty, with comprehensive environmental obligations – particularly on environmental and strategic impacts assessments – and the power to establish fully or highly protected areas that allow marine life to recover."

"Major gaps in ocean governance have resulted in unprecedented threats to squid populations and, more broadly, the high seas as a whole. Governments can and must address this crisis by urgently agreeing a robust Global Ocean Treaty that moves beyond the status quo and is capable of protecting our oceans and the billions of people who depend on them."

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 marine species, 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 its provisions, the new Treaty should ensure that human activities which could potentially harm biodiversity in ABNJ, including fishing, are strictly assessed and effectively managed so that the marine environment is afforded comprehensive protection from the cumulative impacts of human activities on the ocean and climate change. This will help build resilience to climate change, ensure consideration of all potential and cumulative impacts, and inject precaution into management and decision-making processes.⁸⁸ A rigorous, modern and transparent Environmental Impact Assessment framework would also ensure that new fisheries, such as some of the squid fisheries we have discussed, 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 comprehensive ecosystem health by filling gaps and improving cooperation among the management bodies responsible for the

regulation of specific activities on the high seas. The Global Ocean Treaty regime will also streamline biodiversity conservation in the work of existing bodies and 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. By setting regular reporting requirements for State Parties, individually or collectively, and inviting RFMOs to do the same, the Treaty will contribute to enhancing accountability and transparency.

As highlighted in this report, major gaps in ocean governance have resulted in unprecedented threats to squid populations and, more broadly, the high seas as a whole. Governments can and must address this crisis by urgently agreeing a robust Global Ocean Treaty that moves beyond the status quo and is capable of protecting our oceans and the billions of people who depend on them.

"It is of paramount importance that no human activities or sectors, including fishing, are excluded from the scope of the Treaty."



Whale shark

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64 The panel recommended, *inter alia*, “that the Commission strengthen the timelines for the submission and independent verification of catch and effort data for the Jumbo flying squid fishery”, urged that “such measures to be adopted together with a general management measure for that fishery;” recommended that “the Commission take urgent action to implement management measures for the Jumbo flying squid fishery, and for precautionary measures to be put in place until sufficient information is available to undertake a reliable stock assessment”, recognised “the progress in collating and analysing information about Jumbo flying squid and developing stock assessments but Considered that the absence of a precautionary management measure for the Jumbo flying squid is problematic;” recommended that “the Commission consider the implementation of fishing effort limits in the Jumbo flying squid fishery based on existing fishing capacity as a precautionary interim measure pending further scientific and management advice from the Scientific Committee.” Ibid 49.

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76 Ibid 71.

77 Ibid 35.

78 Ibid 14.

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80 Ibid 17.

81 Ibid 32.

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