



The ocean needs to remain healthy for life on the planet to survive. It is considered more vital than the rainforests for providing oxygen to the planet.

There are many problems with the ocean that we all know about like plastic pollution (bottles, straws) and trawling and some that are more obscure: that about half of the plastic pollution is discarded fishing tackle; run-off from animal farms and human nitrates (sewage), algae from fertiliser run-off, cruise ships dumping their sewage at sea, longline fishing, mangrove damage from shrimp farms and coastal development, mining at sea removing living reefs, rising sea levels due to climate warming, military testing damaging ecosystems... the list goes on...

There are, aside from human 'food', many products that derive from fish; animal feed, fertiliser, medicine, supplements and isinglass - to name a few.

Here, we concentrate on the climate change problem caused by fish in the food industry.

We've looked at a selection of studies and news articles about fishing and climate change; there are summaries of the key points, with further reading recommendations at the end.

### **Big fish sinking to the seabed could sequester millions of tons of carbon**

The "Fisheries prevent blue carbon sequestration" study analysed various fish since 1950, and also factored in the emissions from fishing vessels over the last 70 years.

Most land animals release the carbon store in their bodies into the atmosphere when they die. The bodies of marine animals drift down and are ultimately sealed in the deep ocean. This is known as blue carbon and can lie undisturbed - "locked up" - for thousands of years. Fishing stops that from happening by bringing them to the surface and releasing the carbon into the atmosphere instead. The study highlights how half of the loss of blue carbon is in areas found to be unprofitable.

Blue carbon refers to carbon dioxide removed from the atmosphere by the world's ocean ecosystems. The carbon is sequestered by algae, mangroves, salt marshes, seagrasses and macroalgae (kelp and seaweeds), through plant growth and the accumulation and burial of organic matter in the soil. Carbon is also sequestered through the formation of

calcium carbonate shells by marine organisms whose shells make up the chalk in the Cliffs of Dover. Organic material tends to be denser than seawater, so it sinks into open ocean ecosystems away from the coastlines, transporting carbon along with it. This process, called the biological pump, is one reason that oceans constitute the largest carbon sink on the planet.

Mangroves, salt marshes, and sea grasses make up the majority of the ocean's vegetated habitats but only equal 0.05% of the plant biomass on land. Despite their small footprint, they can store a comparable amount of carbon per year as land ecosystems and are highly efficient carbon sinks. Oceans cover 70% of the planet, consequently ocean ecosystem restoration has the greatest blue carbon development potential.

~ Let more big fish sink: Fisheries prevent blue carbon sequestration—half in unprofitable areas. Study authors from University of Montpellier, Changing Ocean Research Unit, Institute for the Oceans and Fisheries, The University of British Columbia, National Geographic Society, University of California, Bren School of Environmental Science and Management, Institut Universitaire de France. October 2020.)

<https://advances.sciencemag.org/content/6/44/eabb4848>

### **Predicting Future Oceans: Climate Change, Oceans & Fisheries**

The conclusions of a Nereus Program report are summed up in the closing statements of two of those who made it. "Global marine ecosystems have already been largely altered by overfishing," said Dr. Daniel Pauly, Professor at the University of British Columbia. "This report clearly points out that any solution needs to deal with the CO<sub>2</sub> problem as well." Dr. Sasakawa, the chairman of the Nippon Foundation, said that "We are at a critical point. If no effective measures are taken against the current problems facing the oceanic environment, human beings will no longer be able to sustain its economic activities, much less its existence."

~ Nereus Program Report "Predicting Future Oceans: Climate Change, Oceans & Fisheries" 2017.

<https://nereusprogram.org/reports/nereus-report-predicting-future-oceans-climate-change-oceans-fisheries/>

### **Toward a better understanding of fish-based contribution to ocean carbon flux**

Carbon flux means the movement of carbon in the ocean, including from the surface to the deep sea. Carbon in excretions from fishes (c.1.65 billion tons annually) make up about 16% of the total carbon that sinks below the ocean's upper layers. The Fish Carbon Working Group says; "Carbon that makes its way below the sunlit layer becomes sequestered, or stored, in the ocean for hundreds of years or more, depending on the depth and location where organic carbon is exported. This natural process results in a sink that acts to balance the sources of carbon dioxide."

~ Scientists from the Fish Carbon Working Group. Funding comes from the Ocean Carbon and Biogeochemistry program, which has support from the National Science Foundation and National Aeronautics and Space Administration. February 2021.

<https://aslopubs.onlinelibrary.wiley.com/doi/full/10.1002/lno.11709>

## **Does climate change affect oceans and marine life**

The International Panel on Climate Change Report of 2014 and the Nature Report of 2019 state that oceans absorb 93% of heat that builds up in the atmosphere, and 25% of the carbon dioxide (CO<sub>2</sub>) released from fossil fuels. Climate change causes shifts in ocean temperature, acidification, deoxygenation and changes in currents.

A few key quotes from these reports include:

"The current science suggests that as the ocean warms and loses oxygen, the body size of animals will be reduced, the distribution of fish will change and the surface production of phytoplankton is going to decline. When there's less plankton at the base of the food web, there's going to be less fish." said Lisa Levin, a professor at Scripps Institution of Oceanography.

David Helvarg, executive director of Blue Frontier, a marine conservation group, said "We're consuming more fish, but less of it is coming from the ocean. The mitigation solutions that involve the ocean include protecting natural carbon storage and enhancing it through restoration of mangroves, salt marshes and sea grass beds. We can reduce emissions on the ocean by reducing shipping emissions. The ocean can be involved in the solutions."

"If we can reduce fossil fuel emissions ... we can substantially reduce the scenario we project," Cheung said.

~ 4. IPCC Report <https://www.ipcc.ch/report/ar5/wg2/> 2014.

Nature Report <https://www.nature.com/articles/s41558-019-0412-1.epdf> 2019.

Climate Change Threatens the World's Fisheries. IPCC Report. Sept 2019.

<https://insideclimatenews.org/news/29092019/ocean-fish-diet-climate-change-impact-food-ipcc-report-cryosphere>

## **Fisheries and Climate Change**

Many cold water species are reducing and some tropical species are appearing on our coasts. Almost all coral ecosystems in tropical areas are expected to disappear by 2050. Climate change is also going to impact bacterial and phytoplankton communities, which are key to the marine food web. As the planet heats up fish will move towards cooler waters. Fishing operations in inter-tropical areas have already diminished by 10-40%, which has significant repercussions for tropical countries. The prediction is that most of the exploited species in Europe will head towards the Polar Regions.

~ The Ocean and Climate Platform (see also 'Further Reading' below)

<https://ocean-climate.org/en/fisheries-and-climate-change>

## **Ghost Gear, The abandoned fishing nets haunting our oceans, 2019**

An estimated 640,000 tonnes of ghost gear enters the ocean every year, equivalent in weight to more than 50 thousand double decker buses according to a 2019 Greenpeace Report. Ghost gear is estimated to make up 10 % of the plastic waste in our oceans, but represents a much higher proportion of large plastics found floating at the surface. Associated rubbish from fisheries, such as packing containers, tape and buoys also

contribute to ocean plastic. In some specific ocean areas, fishing gear makes up the vast majority of plastic rubbish, including over 85 % of the rubbish on the seafloor on seamounts and ocean ridges. The first scientific paper published on the great pacific garbage patch shows over 50% of the plastic there is discarded fishing nets and tackle.



~ Nature <https://www.nature.com/articles/s41598-018-22939-w>

### **Saltwater Fish Extinction by 2048**

So says an international team of ecologists and economists. This will be due to overfishing, pollution, habitat loss, and climate change. Even to these ecology-minded scientists, the results were an unpleasant surprise;

"I was shocked and disturbed by how consistent these trends are - beyond anything we suspected," said Boris Worm, who led the research.

Study researcher Nicola Beaumont, PhD, of the Plymouth Marine Laboratory, U.K.; "If biodiversity continues to decline, the marine environment may not even be able to sustain our lives."

Already, 29% of edible fish and seafood species have declined by 90%.

Ocean species filter toxins from the water, protect shorelines and reduce the risks of algae blooms.

"A large and increasing proportion of our population lives close to the coast; thus the loss of services such as flood control and waste detoxification can have disastrous consequences," Worm says.

The researchers analysed vast quantities of data and concluded that the loss of species is happening fast and getting faster.

~ Worm, B. Science, Nov. 3, 2006; vol 314: pp 787-790. News release, SeaWeb. News release, American Association for the Advancement of Science. Nov 2006.

<https://pubmed.ncbi.nlm.nih.gov/17082450/>

## Four Ways the Fishing Industry is Destroying the Planet

An Animal Equality article highlighted toxic water conditions on aqua-farm sites, aqua-farming itself, bottom trawling and longline fishing as just four of the ways that fishing is causing climate devastation.

Aquafarmed fish spend their lives (up to two years) confined in densely populated spaces. Aquafarms use pesticides and antibiotics, these chemicals along with faeces contaminate surrounding areas causing illness and disease amongst wild fish. A study in Science shows that a 2-acre fish farm can have as much waste as a town of 10,000 people. Bottom trawling is where giant nets the size of football pitches are dragged across the ocean bed. Up to 95% of global ocean damage is a direct result of bottom trawling, says the United Nations. Fishing boats that trawl the ocean floor release as much carbon dioxide as the entire aviation industry, according to a groundbreaking study.

Longline fishing is a technique in which boats drag long fishing lines through the water with several hooks on them. These fishing lines are up to 50 feet long, and they catch and kill indiscriminately. The unwanted animals are then thrown overboard as "bycatch."

~ Animal Equality Four Ways the Fishing Industry is Destroying the Planet

<https://animalequality.org/blog/2019/09/30/fishing-industry-destroying-environment/>

<https://science.sciencemag.org/content/247/4943/631>.

[https://www.un.org/Depts/los/general\\_assembly/documents/impact\\_of\\_fishing.pdf](https://www.un.org/Depts/los/general_assembly/documents/impact_of_fishing.pdf)

<https://www.theguardian.com/environment/2021/mar/17/trawling-for-fish-releases-as-much-carbon-as-air-travel-report-finds-climate-crisis>

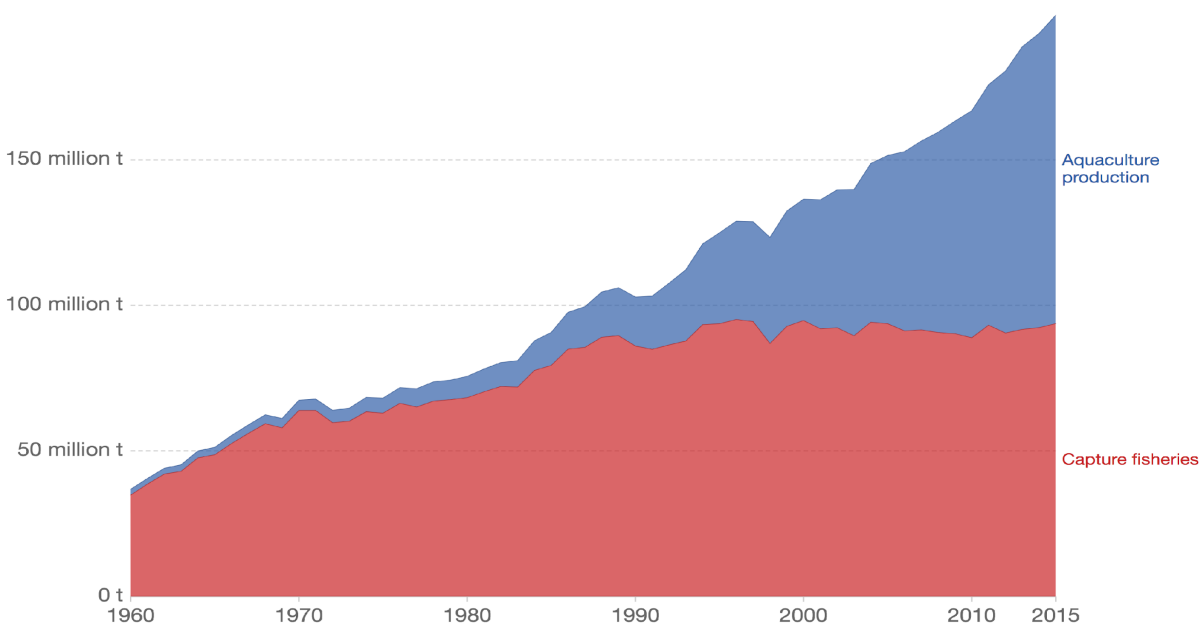
[SUPERTRAWLERS - The Fishing Boats You Didn't Know Are Ruining Our Seas](#)

## Aquaculture now surpasses fish caught in the wild...

### Seafood production: wild fish catch vs aquaculture, World

Aquaculture is the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants. Capture fishery production is the volume of wild fish catches landed for all commercial, industrial, recreational and subsistence purposes.

Our World  
in Data



Source: UN Food and Agriculture Organization (FAO)

OurWorldInData.org/seafood-production • CC BY

In 2016 91 million tonnes of wild species and 80 million tonnes of farmed fish with 20 million tonnes of wild fish converted to fish meal.

## **Six in 10 Fish species could face reproductive failure as temperatures Rise**

Like humans, fish need to breathe in more oxygen as the temperature rises.

"Our findings show that, both as embryos in eggs and as adults ready to mate, fish are far more sensitive to heat than in their larval stage or sexually mature adults outside the mating season," Flemming Dahlke, a marine biologist at the Alfred Wegener Institute and lead author of this study about rising ocean temperatures. The study found that if global warming is limited to 1.5 degrees Celsius by 2100, only 10 percent of fish species would either have to move to new, cooler spawning grounds or experience reproductive failure. If greenhouse gas emissions remain high, however, and warming reaches 5 degrees C or more, up to 60 percent of fish species would be impacted.

"Humankind is pushing the planet outside of a comfortable temperature range and we are starting to lose suitable habitat," Hans-Otto Pörtner, a climatologist at the Alfred Wegener Institute. The double whammy of climate change and pesticide use could crash fish populations.

The rise in temperature is also a problem for the recreational fishing industry (worth \$46 billion in the US alone). This is because the fish are having to migrate to remain within water that is a suitable temperature for their very existence.

~ Alfred Wegener Institute for the Marine Research meta-study "Rising water temperatures could endanger the mating of many fish species" July 2020.

<https://science.sciencemag.org/content/369/6499/65> & "Fish in Hot Water: Streams, Lakes, and Oceans" Climate Central. 2019

<https://medialibrary.climatecentral.org/resources/fish-in-hot-water-streams-lakes-and-oceans>

## **Estimating the Number of Fish Caught in Global Fishing Each Year**

A study by Fish Count UK has been made for the numbers of fish killed globally each year by fishing. The study used FAO data together with the average weights for fish species. It is estimated that, on average each year:

- **790 – 2,300** billion\* fishes were caught from the wild for 2007-2016.
- **970 – 2,700** billion fishes were caught from the wild for 1999-2007.
- **460 – 1,100** billion fishes were caught to make fishmeal and oil for 2007-2016.
- **51 – 167** billion farmed fishes were killed for food in 2017.
- **250 – 600** billion farmed crustaceans were also killed for food in 2017.

\* rounded to 2 significant figures.

In a similar scenario to that of passing protein through cows to provide less protein for humans to eat than if they, the humans, ate the crops directly; many fish caught are for feed. Feed fish species tend to be small. It takes between 2.5 and 5kg of wild feed fish to

produce 1kg of farmed carnivorous fish. e.g. a 10g sand-eel converted to fishmeal and fish oil dies to produce 3g of salmon flesh.

### The negative impact of IUU fishing - key facts

**Global losses** from IUU fishing are estimated to be between **\$10 and \$23.5 billion per year**. Between **11 and 26 million tonnes of fish are caught illegally per annum**<sup>4</sup>.

IUU fishing represents a major **loss of revenue**, particularly to some of the poorest countries in the world where dependency on fisheries for food, livelihoods and revenues is high. For example, it is estimated to **cost West Africa \$1.3 billion a year**<sup>6</sup>.

In 2005 the European Union imported nearly €14 billion of fisheries products. **Conservative estimates valued IUU catches imported into the EU in the same year at 500,000 tonnes or €1.1 billion**<sup>5</sup>.

Estimates suggest that global IUU catches correspond to between **13% and 31% of reported fisheries production**. In some regions this figure can be as high as **40%**<sup>4</sup>.



The figures exclude fish caught illegally (including unregulated and unreported catches), fish caught as bycatch and discarded (thrown overboard), fish that die due to injuries, stress or exhaustion following escape from fishing gear, fish caught by lost and discarded fishing gear ("ghost fishing"). Also excluded are all the unrecorded fish which can include bait and feed.

# BYCATCH

## by-catch

noun \-kach, -kech\ - The portion of a commercial fishing catch that consists of marine animals caught unintentionally.

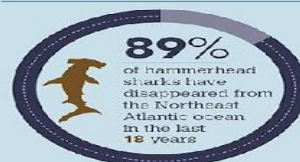
**300,000**  
cetaceans are  
killed every year



Cetaceans are marine mammals including whales, dolphins and porpoises

Just over **27** million tonnes of marine life are discarded annually as a result of fishing

**27**  
million



**9 OUT OF 10**

Marine life, cetaceans and seabirds caught at sea are discarded, this means only **10%** caught are eaten



Discard Rate



Percent kept

**Top 4 fisheries**  
highest discard  
ratios by weight

Kg Discard per  
Kg Landed



**300**  
thousand  
seabirds  
are killed  
each year

**26** species of seabird, including **23** species of albatross are threatened by extinction due to longlining



**1 IN 5**

People on this planet depend on fish as a primary source of protein within their diet

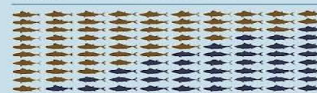


**Less than 2%**

Of our planet's ocean is protected from factors that kill marine life and destroy environments

**57%**

Of the world's fish supply is already exploited



**ANNUAL**  
discard rate  
by world region



National Oceanography Centre - Natural Environment Research Council  
 Food & Agriculture Organization of the UN  
 The Royal Society for the Protection of Birds

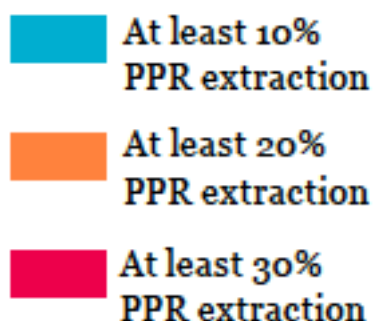


## Fishing Effort has increased but catch continues to decline from 1950 – 2006

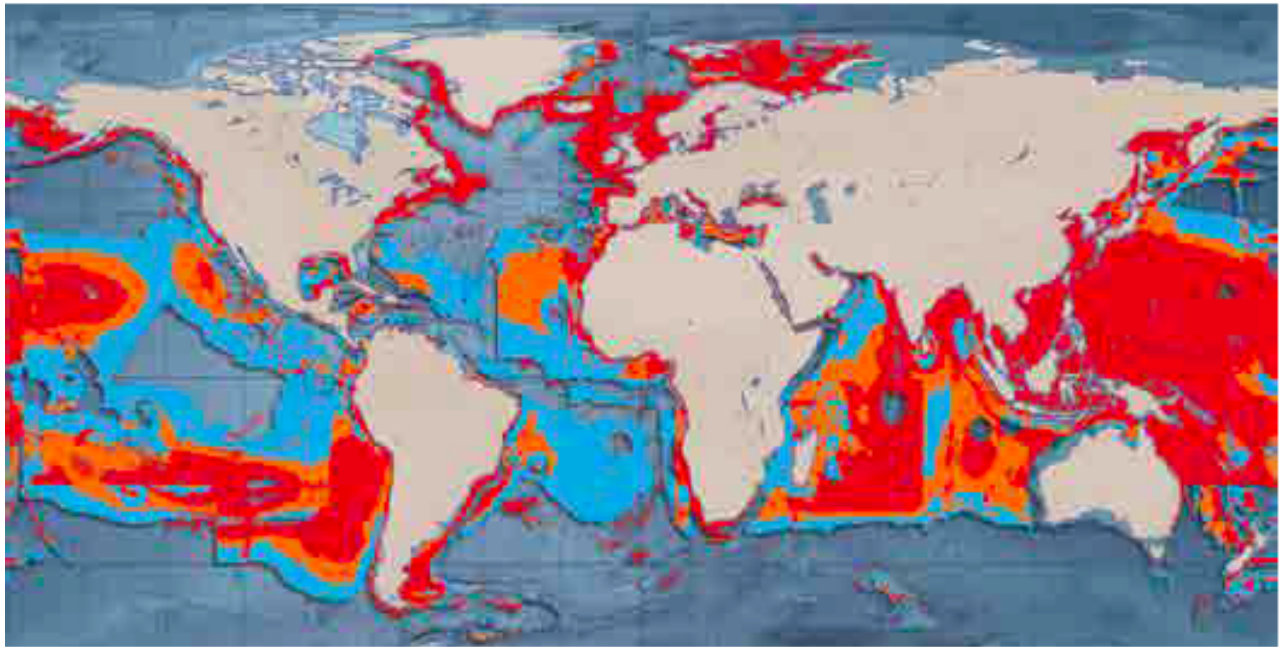
According to a recent study in the journal [Science Advances](#), the average distance industrial fishing fleets travel from their home ports to fishing grounds is twice what it was in the 1950s, expanding the total area of the world's oceans that are fished from 60 to 90 percent. Despite ranging farther afield and fishing in new waters, however, the fleets of the top 20 fishing countries — collectively responsible for 80 percent of the global industrial fishing catch — are hauling in far smaller amounts of fish. Today, about 7 metric tons of fish are caught per 1,000 kilometers traveled by those 20 countries' fleets, less than a third of the more than 25 metric tons they caught per 1,000 kilometers traveled in the 1950s.

### *Key*

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**1950**



**2006**

Almost 6 billion tonnes of fish and invertebrates (e.g. crustaceans and molluscs) have been extracted from the world's oceans since 1950. Annual catch increased dramatically from 28 million tonnes in 1950 to more than 110 million tonnes in 2014. However, since peaking in 1996 at about 130 million tonnes, catch has been decreasing at an average rate of 1.2 million tonnes per year.

The huge increase in the proportion of primary production requirement (PPR) extracted by fisheries globally between 1950 and 2006. PPR indicates the total amount of food necessary to sustain fish populations in a certain area (Watson, Zeller and Pauly 2011).

### **Climate change is removing ice**

Harp seals give birth on ice. Sea Shepherd knows that climate warming is removing the ice and, consequently, seals. In the Gulf of St. Lawrence, where once there were 200,000 seal pups, there are now patches of ice with just a few hundred seal pups. The Canadian government allows 400,000 adult seals to be killed each year. They define adulthood as six weeks or older.

Sea Shepherd points out that up to 40% of seafood worldwide is sourced illegally and that coordination between governments, conservation societies, and industry is needed to prevent this overfishing and fight climate change.

In what is one of his best interviews late last year with In Depth, a diving website, Captain Paul Watson the founder of Sea Shepherd made this analogy...

"If you take a look at the earth for what it really is, a spaceship on this incredible voyage around the Milky Way galaxy, at incredible speeds, every spaceship has a life-support system. That life-support system provides us with food, the air we breathe and regulates climate and temperature. That life-support system is a machine that isn't run by us. We are just visitors who are having a wonderful time entertaining ourselves. But what we are doing is killing off crewmembers. And there's only so many crew members you can kill before everything begins to break down. This planet is really run by trees and bees and worms and viruses and microbes. Those are the engineers of planet Earth. And we are killing

them. And if we do, we will follow. The passengers will go down with the ship when the crew are no longer able to operate that ship.”

~ In Depth & Eco Watch articles.

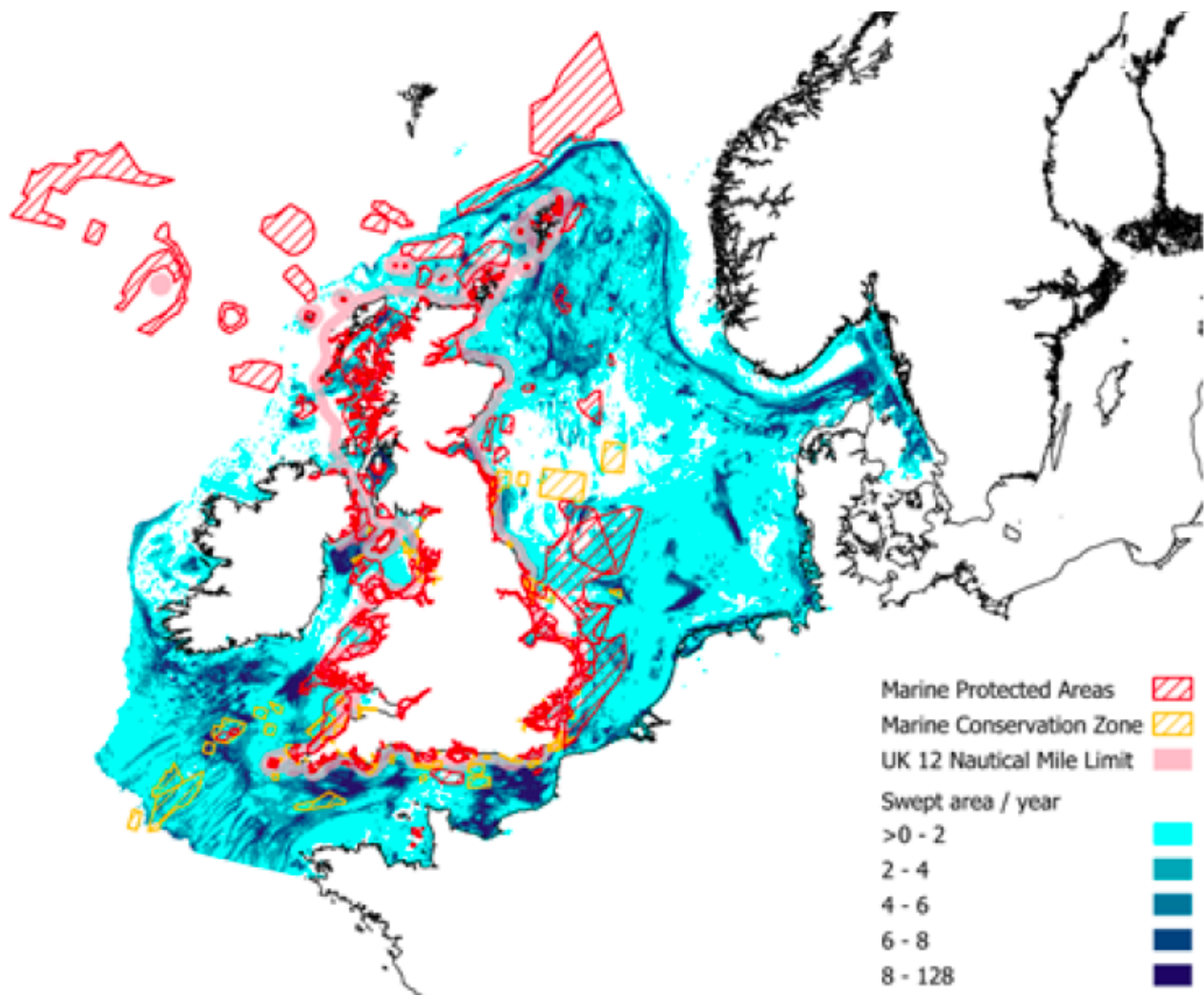
<https://que.com/blog/can-we-save-our-planet-environmental-hero-paul-watson-offers-a-perspective/>

<https://www.ecowatch.com/michelle-rodriguez-baby-seals-2336771103.html>

## Marine Protection Areas

Why are Greenpeace dropping boulders onto the seabed? These are to stop trawlers from operating in these protected waters. The government says they have created 300 MPA's (marine protected areas) but, in reality, very little is protected in these areas. Trawlers regularly dredge the sea beds even in these areas whilst the government sits by refusing to make it illegal.

The boulders will protect just 20% of an MPA off Brighton from these trawlers. 11



Distribution of trawling intensity overlaid with Marine Protected Areas and Marine Conservation Zones. Trawling intensity (shown in blue) indicates the estimated number of times per year that the seabed is fished by all bottom-contacting gears.

“Marine habitats capture up to 20 times more carbon per hectare than forests on land. Fully

restored, our coastal ecosystems could capture a third of the UK's emissions from 2018. Restoring and stopping deterioration of coastal ecosystems – tripling the area of seagrass and increasing the area of other habitats by 15% – could prevent the loss of almost 40 million tonnes of carbon dioxide equivalent (MtCO<sub>2</sub>e) and store a further 137 MtCO<sub>2</sub>e by 2050, equivalent to the emissions from 86,000 long-haul flights. This would have a net economic benefit of £10.1 billion by 2050 – which would increase further in the future as the protected and restored habitats continue to accumulate more carbon. Protecting and restoring these habitats could save an estimated £6.2 billion in spending on artificial flood defences by 2050.

Today, UK MPAs cover about a quarter of UK seas, but many are little more than “paper parks”, allowing even the most destructive types of fishing like bottom trawling. Extending full protection to 30% of our seas would yield multiple benefits, yielding net gains estimated at £10.5 billion and supporting up to 12,000 jobs in the tourism and recreation sector alone. Reduced trawling in these areas would also allow habitats to recover and capture carbon emissions worth an additional £459 million by 2050. Growing the populations of large marine mammals also supports carbon capture.

For effective marine conservation, scientists have recently suggested that MPAs would need to cover 37% of the ocean in total, very similar to the 40% coverage recommended by others for a representative network of **marine reserves** designed to protect biodiversity. Currently, there are in the region of 14,600 marine protected areas (MPAs) listed on the World Database on Protected Areas, which is just over 4% of the global ocean.

Increasing offshore wind capacity by 40GW by 2030 and 75GW by 2050, in line with net-zero commitments, would deliver savings in carbon emissions valued at £26 billion compared with a business-as-usual scenario. This level of offshore wind generation could also create 67,000 jobs along with 16,200 jobs in tidal power and 12,000 jobs in wave power.

Shipping is another area where we need to increase ambition to achieve net zero. In 2017, greenhouse gas emissions from UK shipping were 13.8MtCO<sub>2</sub>e – about 3% of total UK emissions. Halving emissions by 2050 through increased efficiency and alternative fuels would deliver carbon savings worth £9.8 billion.”

Based on this information it seems reasonable to assume that protecting 100% of the UK seas and moving to a plant based food system, could yield net gains of £31.5 billion and 36,000 jobs and a further £1.4 Billion in carbon sequestration benefits. By comparison, the UK fishing industry has an estimated value of £989 million per year and supports around just 12,000 full- and part-time fishers.



**COASTAL ECOSYSTEMS  
CAN PROVIDE OVER  
£6BN WORTH OF FLOOD  
PROTECTION SERVICES**



**£9.8BN WORTH OF  
SHIPPING EMISSIONS  
REDUCTIONS BETWEEN  
2020 AND 2050**

### **Total Benefits and Savings by 2050**

Coastal Ecosystem Restoration economic benefit of - £10.1 Billion

Reduced spending on Artificial Flood Defences - £6.2 Billion

Reduced Shipping Emissions - £9.8 Billion

100% No Take Marine Protected Areas economic benefit - £31.5 Billion plus carbon savings of £1.4 Billion and 36,000 jobs

Offshore Wind Savings in Carbon Emissions - £26 Billion and 95,000 jobs



**COASTAL ECOSYSTEMS  
CAN CAPTURE 33% OF  
THE UK'S 2018  
EMISSIONS, WORTH  
£10.1BN**



**SUSTAINABLY  
DEPLOYING OFFSHORE  
RENEWABLES  
WILL BRING £26BN  
IN BENEFITS**



**BETTER MANAGEMENT  
OF MPAS CAN DELIVER  
UP TO £10.5BN OF  
RECREATIONAL AND  
OTHER BENEFITS**

**Ending fishing in UK Waters could lead to a total of £41.6 billion in benefits, Reduced Spending of £6.2 Billion and £37.2 billion in savings due to reduced carbon emissions and 131,000 jobs in energy, tourism and recreations sectors.**

Today the UK fishing industry is worth less than £1 Billion per year and supports 12,000 jobs.

~ **Greenpeace, Carbon in Marine Ecosystems Technical Report 2017**, and WWF Report The Value of Restored UK Seas, 2021

<https://www.theguardian.com/commentisfree/2021/feb/26/if-the-uk-government-stop-industrial-fishing-oceans-activists-greenpeace>

<https://www.wwf.org.uk/ocean-heroes/uk-seas>

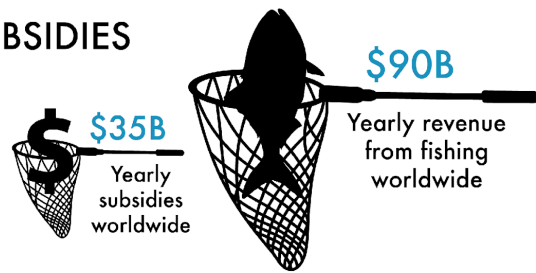
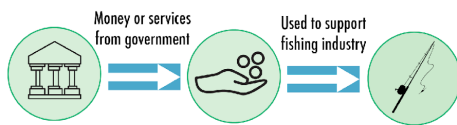
## **Fishing Subsidies**

The main problem is the massively subsidized fishing industry. OceanCanada and their collaborators from the Sea Around Us and the Nereus Program have published [an estimate of global fisheries subsidies](#) in the international journal *Marine Policy*. They found “that \$35 billion in subsidies are put into fishery industries around the world every year. Given that the total global revenue from fishing is \$90 billion per year, landed and sold, a third of revenue is from handouts”.

We're gonna need a bigger boat

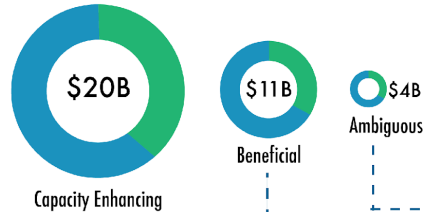
## GLOBAL FISHERIES SUBSIDIES

### WHAT ARE FISHERIES SUBSIDIES?

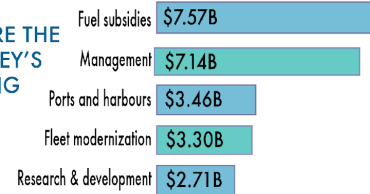


### TYPES OF SUBSIDIES GIVEN EACH YEAR

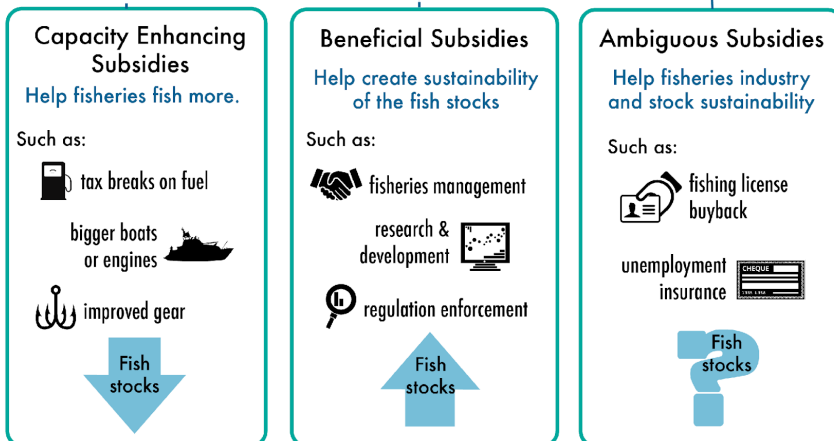
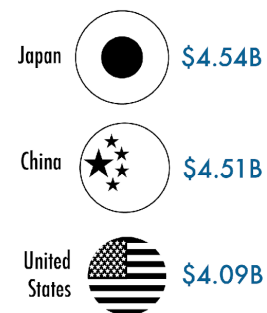
Developed Countries  
Developing Countries



### WHERE THE MONEY'S GOING



### TOP 3 COUNTRIES



Source: Sumaila, Lam, Le Manach, Swartz, & Pauly (2016). Design: Lindsay Lafreniere



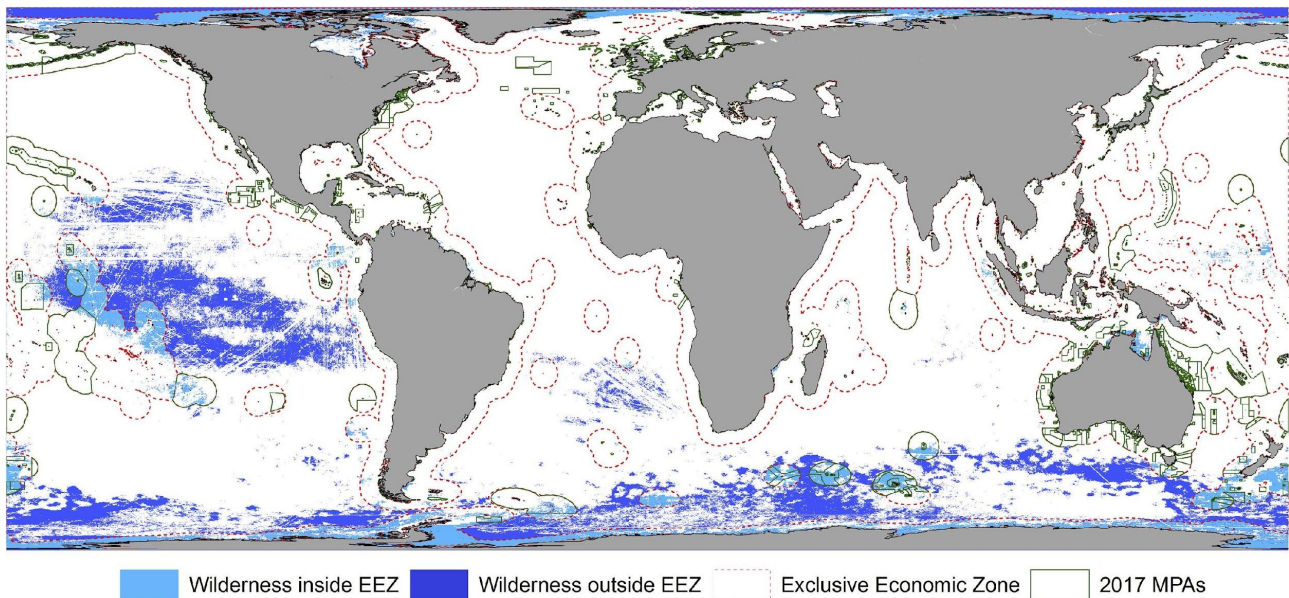
## Updated estimates and analysis of global fisheries subsidies, 2019

A 2019 [Report](#) updated the quantity of subsidies; "We estimate global fisheries subsidies at USD 35.4 billion in 2018, of which capacity-enhancing subsidies are USD 22.2 billion. The top five subsidising political entities (China, European Union, USA, Republic of Korea and Japan) contribute 58% (USD 20.5 billion) of the total estimated subsidy."

<https://www.sciencedirect.com/science/article/pii/S0308597X19303677?via%3Dihub#fig1>

## The Location and Protection Status of Earth's Diminishing Marine Wilderness

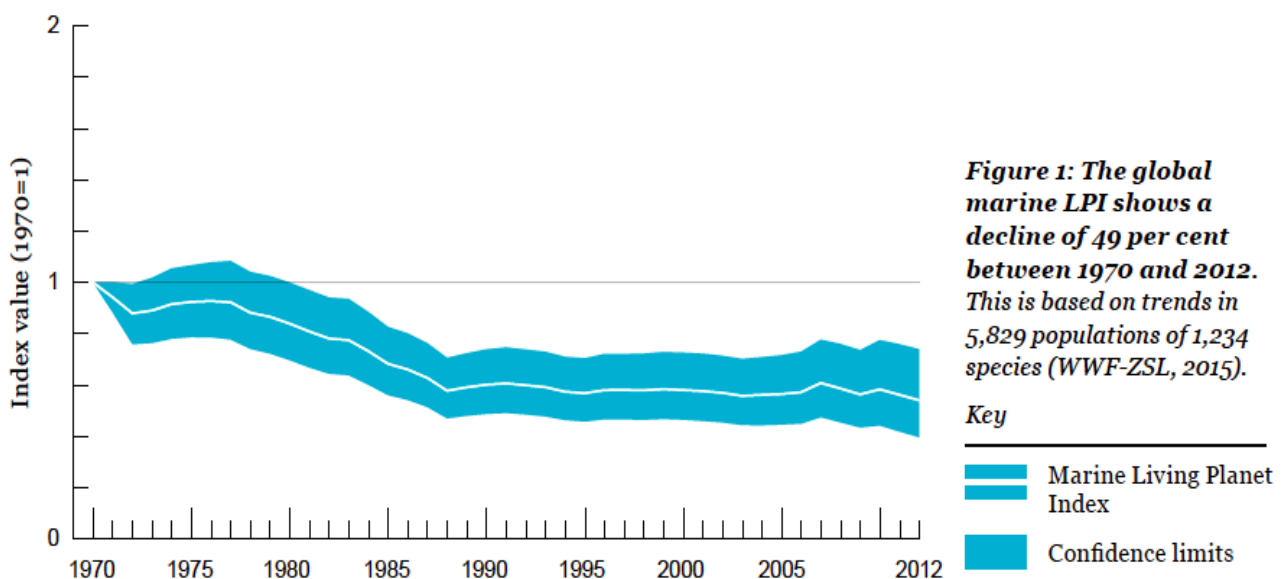
13% of the ocean meets this definition of global wilderness, with most being located in the high seas. An area is classified as a wilderness when they have both very little impact (lowest 10%) from 15 anthropogenic stressors and also a very low combined cumulative impact from these stressors.



~ [https://www.cell.com/current-biology/fulltext/S0960-9822\(18\)30772-3](https://www.cell.com/current-biology/fulltext/S0960-9822(18)30772-3)

## Marine Species Populations have declined by an average of 50% from 1970 to 2012

Populations of some commercial fish stocks, such as tuna, mackerel and bonito, have fallen by almost 75% according to the WWF Living Blue Planet Report, 2015 from the WWF and the Zoological Society of London.



## Dynamite, Cyanide, Lionfish and Shark Fishing

A few of the more obscure fishing practices that can get overlooked are in themselves billion dollar industries; dynamite fishing is very destructive and breaks up coral reef. 12 Cyanide fishing is a billion dollar industry; it initially came about in order to catch tropical

fish for aquariums, it is now used for catching fish as 'food' as well and it decimates the ocean and other living beings.

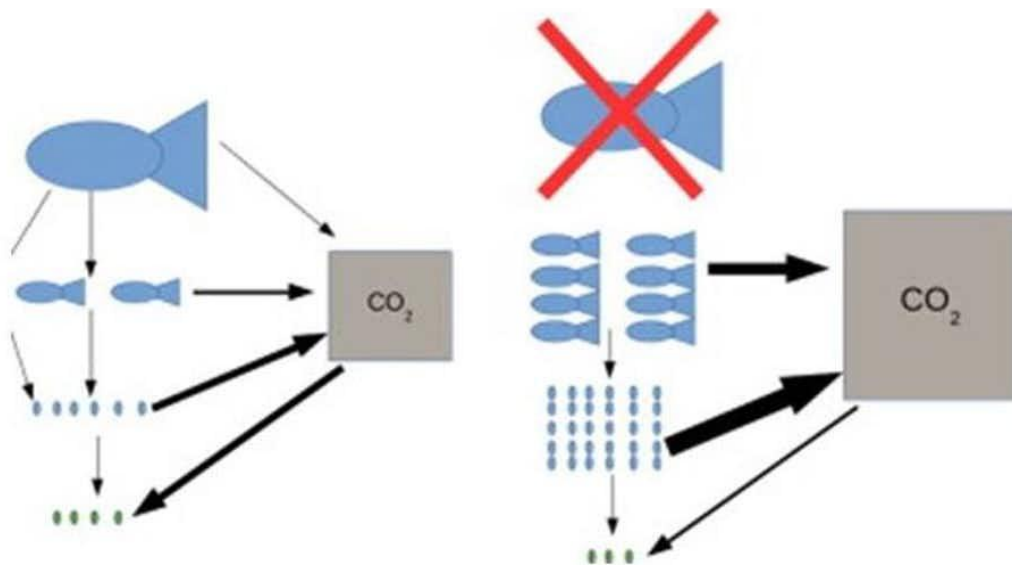
~ [https://en.wikipedia.org/wiki/Cyanide\\_fishing](https://en.wikipedia.org/wiki/Cyanide_fishing)

Lionfish caught in the Tropical Coral Triangle and released from an aquarium in the Caribbean, where they have no predators, is a voracious predator. One female spawns 2 million eggs a year. These non-indigenous Lionfish threaten the ocean's ecosystems off the east coast of the southern American areas.

~ <https://www.nature.com/news/invasive-lionfish-discovered-in-brazil-1.17414>

Sharks maintain healthy populations - balance - on a reef. By catching/removing them causes problems with ocean ecosystems. Over the past 20 years, the demand for shark fins soup has decimated shark populations. As most commercially caught fish are predators, fishing and shark finning are resulting in a rapidly decreasing number of predators in the marine ecosystem thereby more CO<sub>2</sub> contributing to climate change.

~ <https://www.sciencedirect.com/science/article/pii/S1574954116301820>



Removal of predatory fish through fishing can increase biomass of smaller fish and zooplankton and result in higher levels of CO<sub>2</sub> production in marine environments.

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## Industrial Fishing is Wrecking the Oceans

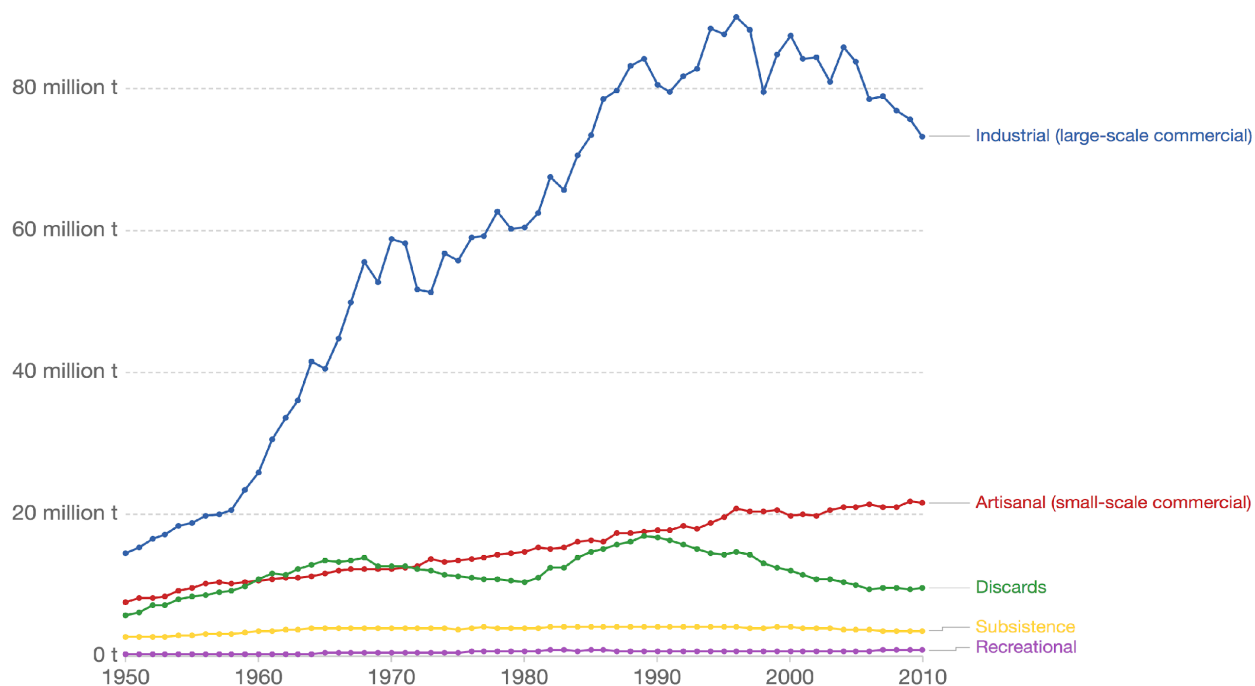
A recent study found "that vessels registered to wealthy countries are responsible for 78 percent of trackable industrial fishing in the waters of less-wealthy countries and a whopping 97 percent on the high seas, international waters that are outside of any one country's jurisdiction". The rich industrial fishing fleets are in effect stealing the fish from

the waters of poorer countries often legally through bilateral agreements that are unmonitored and unregulated.

## Global wild fishery catch by sector

Breakdown of global wild fishery catch by sector. This relates only to wild fishery catch, and does not include aquaculture (fish farming) production.

Our World  
in Data



Source: Pauly and Zeller (2016)

CC BY

## The predictions for the future health of the oceans are alarming.

Several studies foresee that the majority of the ocean will be occupied by little more than a combination of jellyfish and plastic waste 17, 18. Globally, 10% of the plastic in the oceans is discarded fishing gear.

~

<https://theconversation.com/attack-of-the-jellies-the-winners-of-ocean-acidification-50576>

<https://www.condorferries.co.uk/plastic-in-the-ocean-statistics>

<https://www.theguardian.com/environment/2019/nov/06/dumped-fishing-gear-is-biggest-plastic-polluter-in-ocean-finds-report>

**Trillions of sea creatures are killed yearly and this is clearly causing devastation to the ocean which in turn causes climate change. This won't happen when there is a plant-based food system!**

## FURTHER READING

"Fishing is dependent on marine food webs that are sensitive to overexploitation and climate change. This POSTnote focuses on marine fisheries, including wild capture and farming (aquaculture) of fin- and shellfish, and their processing. It summarises impacts on oceans and fisheries of changes including ocean warming, acidification, deoxygenation and storms, and explores how fisheries may adapt."

UK Parliament

Climate Change and Fisheries Research Briefing Published Thursday, 27 June, 2019

<https://post.parliament.uk/research-briefings/post-pn-0604/>

The International Union for Conservation of Nature report

The Ocean and Climate Change

[https://www.iucn.org/resources/issues-briefs/ocean-and-climate-change\](https://www.iucn.org/resources/issues-briefs/ocean-and-climate-change)

The Fish Site

Putting a figure on aquaculture's greenhouse gas emissions

<https://thefishsite.com/articles/putting-a-figure-on-aquacultures-greenhouse-gas-emissions>

Nature

Fuel use and greenhouse gas emissions of world fisheries

<https://www.nature.com/articles/s41558-018-0117-x>

Impacts of climate change on fisheries and aquaculture Synthesis of current knowledge, adaptation and mitigation options

Food and Agriculture Organisation of the United Nations

Fisheries and Aquaculture Technical Paper

<http://www.fao.org/3/i9705en/i9705en.pdf>

The Ocean Climate have produced six ocean fact sheets for the general public:

[https://www.ocean-climate.org/wp-content/uploads/2016/10/161011\\_FactSheets\\_EN.pdf](https://www.ocean-climate.org/wp-content/uploads/2016/10/161011_FactSheets_EN.pdf)

[https://www.ocean-climate.org/wp-content/uploads/2016/11/161115\\_DIFFCO\\_EN\\_06.pdf](https://www.ocean-climate.org/wp-content/uploads/2016/11/161115_DIFFCO_EN_06.pdf)

The Ocean: 1. The Planet's Thermostat, 2. Origin of Life on Earth, 3. From the Ocean to the Clouds, 4. Ocean Circulation, 5. An Indicator of Climate Change, 6. Sea Level: 300 years of Observation.

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Charlie Pritchard for Animal Rebellion's Medium blog 2021

