

How can we protect the forests of the deep?

Deep sea life is being destroyed by sea bottom trawling before scientists can unravel the mysteries of the deep.

There is unprecedented concern about the destruction of our deep seas. More than 1000 eminent marine scientists from 60 countries have signed a public statement calling for a moratorium on bottom trawling in international waters.

Greenpeace and a broad coalition of environmental groups are campaigning for a UN General Assembly Resolution to impose an immediate moratorium on high seas bottom trawling.

The moratorium would allow a 'time out' for the UN to assess deep-sea biodiversity and ecosystems, and to develop legally binding international regimes to conserve and manage the bottom fisheries of the high seas.

The scientific mysteries that remain about seamounts and the complex ecosystems that take centuries to develop around them, gives added urgency to the need for an immediate moratorium on high seas bottom trawling. Continuing to ignore the consequences of clear cutting these deep sea rainforests would be a scientific and environmental disaster.

Photo courtesy: NIWA

"We know that seamounts support large pools of undiscovered species, but we cannot yet predict what is on the unstudied ones. The tragedy is that we may never know how many species become extinct before they are even identified."

Dr Frederick Grassle, Rutgers University



Bottom trawl nets are notorious for clearfelling deep sea corals such as this threatened species (*Paragorgia* sp.) during the initial trawls of virgin seamounts.

Cover Photo: As juveniles, glass squid live in the upper ocean. However, as adults, they live in much deeper water. Sperm whales and other marine mammals dive down to feed upon these and other oceanic squid; in fact, deep-living squid are the sperm whale's staple diet. Scientists fear that bottom trawling is altering the fragile deep-sea ecosystem, potentially with severe and unpredictable consequences. © ExploreTheAbyss.com



Marine biologist Kat Bolstad holds a black coral twig recovered from bycatch discarded from a deep water trawler in international waters in the Tasman Sea. Black coral is protected in nearby NZ waters, and is listed under the international CITES agreement.

www.greenpeace.org/saveourseas

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Far from human eyes

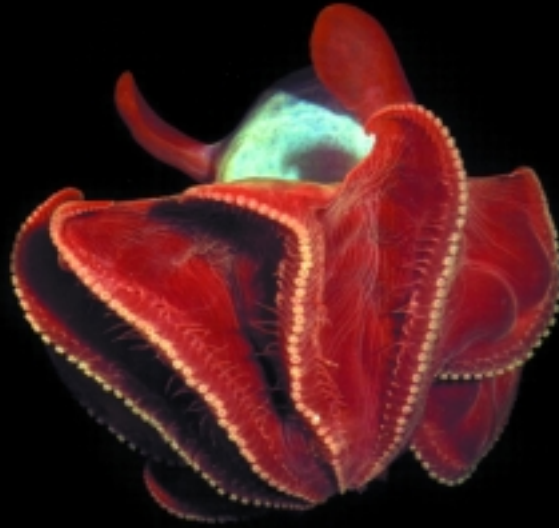
exists an undiscovered world.

Veiled by water and far below the surface,

the mysterious dark ocean depths are rich with life.

Mountains under the sea

Deep beneath the oceans, massive mountains, ridges and plateaus rise from the sea floor never to reach the surface. The Earth's longest mountain range is not on land but under the sea – the Mid-Oceanic Ridge, which winds around the globe from the Arctic Ocean to the Atlantic. It is four times longer than the Andes, Rockies, and Himalayas combined! The biggest of these underwater mountains are called 'seamounts', rising more than 1,000 metres from the sea floor. Scientists estimate that there are between 30,000–100,000 seamounts scattered throughout the oceans, though less than 1% have been properly explored and documented.



Deep sea treasures

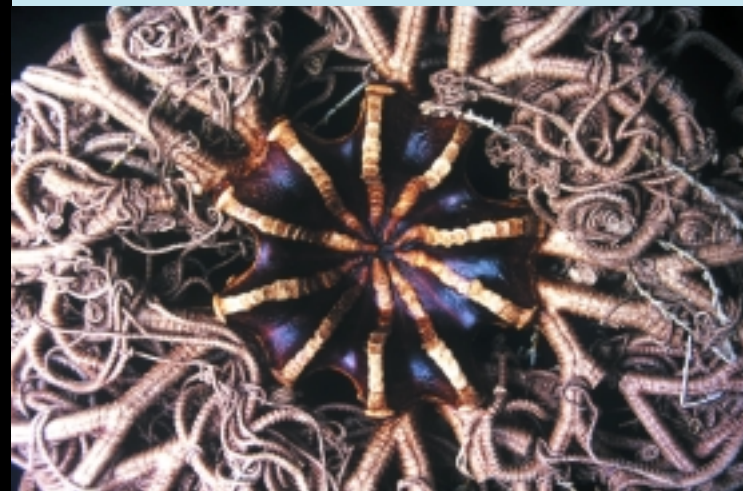
Underwater mountains are oases of life. Here, nutrient rich currents well up, feeding diverse and extraordinary ecosystems.

On some mountains, groves of towering corals reach up into the darkness, catching food in their open fans. Some corals are thousands of years old, several storeys high, with trunks as thick as lamp posts. These slow growing corals are the ancient forests of the deep.

Sea spiders, whelks, octopus, squid and other animals weave their way through the forest while crabs and other crustaceans hide in crevices. In the sediments a myriad of worms, clams, shells and small crustaceans thrive.

In these deep sea forests unknown creatures have lived for millions of years.

- Orange Roughy – A fish that can live over 120 years and doesn't breed until it is 20-30 years old – lives around seamounts and gathers above them to spawn.
- Giant Squid – Grows to 12 metres long and weighs in at 300kgs. No one has ever seen one in the wild – an example of how little we know about the deep.



- Basket star (above) – Resemble walking bushes when moving across the seabed, but when they stop to feed they arrange their arms into a beautiful fan. The upheld fans trap krill and other plankton.
- Whales and Sharks – These predators can be found in the deep ocean and around seamounts. Sperm whales dive to hunt squid. The Pacific sleeper shark is the biggest known deep sea fish, up to 7 metres long.

Mysteries of the deep

One study of an area half the size of a tennis court found 898 species, over half of which were unknown to science.

Investigations are underway that look into the biomedical properties of deep sea organisms and their potential in the treatment of cancer and other diseases.

Umbrella octopus, lizard fish and primitive lobster (left) have all been brought up from the deep sea by bottom trawl nets.

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Un-named seamount sea urchin (right)



Sea bottom trawling – the biggest threat

But these beautiful and extraordinary communities are under threat, by bottom trawling – one of the most destructive fishing practices in the world.

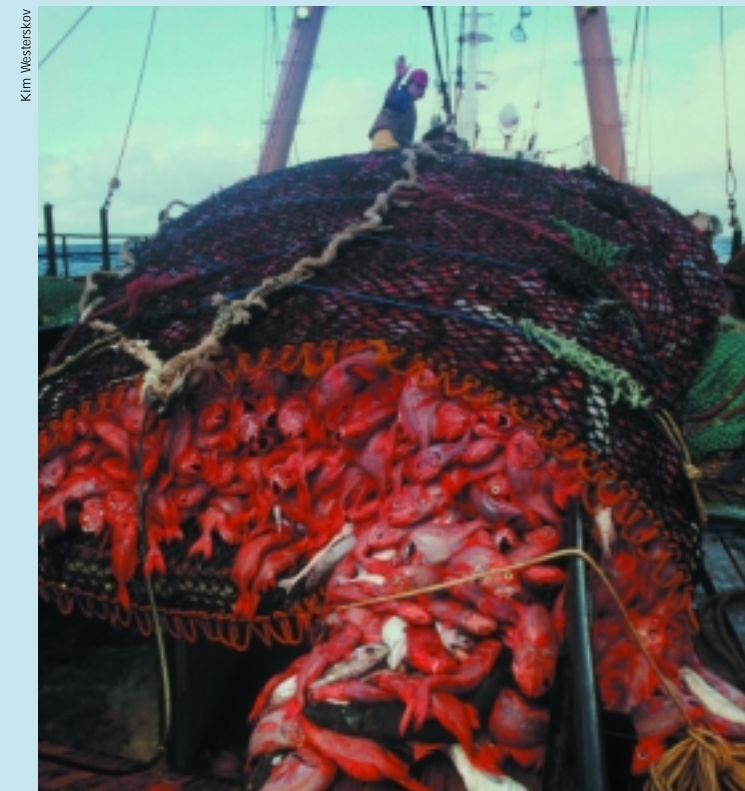
Armed with acoustic fish-finders and satellite technology, fishing is now happening at the greatest depth in history.

Bottom trawl nets can be enormous. The biggest have mouths the length of a rugby field. Some are weighted across the bottom with heavy steel rollers that indiscriminately smash and crush corals – they swallow everything in their path.



Orange roughy fishermen offloading the steel rollers that weigh down bottom trawl nets.

When hauled onboard, ever-decreasing tonnages of over-exploited orange roughy and oreo spill across the deck, and so too does the trawl 'trash'. This unwanted bycatch includes the deep sea reef-forming black coral, threatened giant mussels and clams, barnacles and squid.

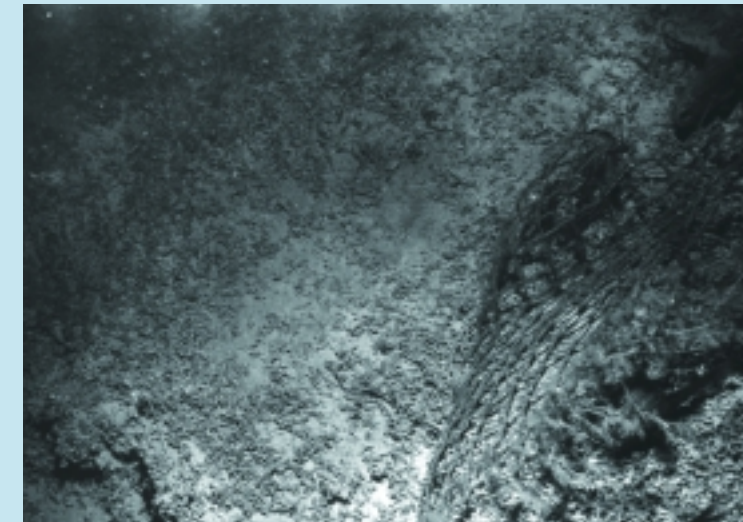


Orange roughy are caught both as they are breeding above seamounts and among their habitats on seamounts.

Bottom trawling clearfells the ancient coral forests of the sea. No one knows how long it takes for these communities to recover, or even if they can.



Coral forests can be up to 2000 years old and form the habitat of orange roughy and many species currently unknown to science.



Once a coral forest is bottom trawled it bears little resemblance to its natural state. Nobody knows if it can recover from this destructive fishing method.

Very little is known about the biology of deep sea fish, but it is all too apparent that these fish stocks, like the ecosystems in which they live, are very vulnerable to collapse. Some populations of orange roughy are now estimated to be only three percent of their original size. This large-scale destruction is being wrought at the hands of only a few countries and a small number of fishing vessels.

Only eleven countries are engaged in industrial scale deep sea bottom trawling: Spain, Russia, Portugal, New Zealand, Norway, Japan, Estonia, Lithuania, Iceland, Denmark (for the Faroe Islands), and Latvia. The European Union countries alone account for more than 60% of the overall catch. With coastal waters increasingly depleted of commercially valuable fish populations, these vessels have moved on to more lucrative grounds. New Zealand companies now bottom trawl in international waters, where virtually no rules govern their fishing. They have travelled as far as South Africa and Europe in their quest.