

Forum:	Environment Commission
Issue:	Measures to reduce industrial impact on marine biodiversity
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Introduction

All species are an integral part of their ecosystems by performing functions that are essential to the maintenance of the environment. Not only do they affect the balance of the ecosystem, they play an important role economically in terms of food production, industry, and tourism. As the ocean is a complex three-dimensional world, home to 230,000 documented marine species, marine biodiversity is a field that is still poorly understood due to the vastness in size; there is still unexplored ocean terrain. Advancements in technology have both positive and negative impacts. It helps in discovering and classifying new species; however, it also pollutes the oceans. The effects on marine life are apparent, but are often overlooked due to the insufficient knowledge about aquatic terrain.

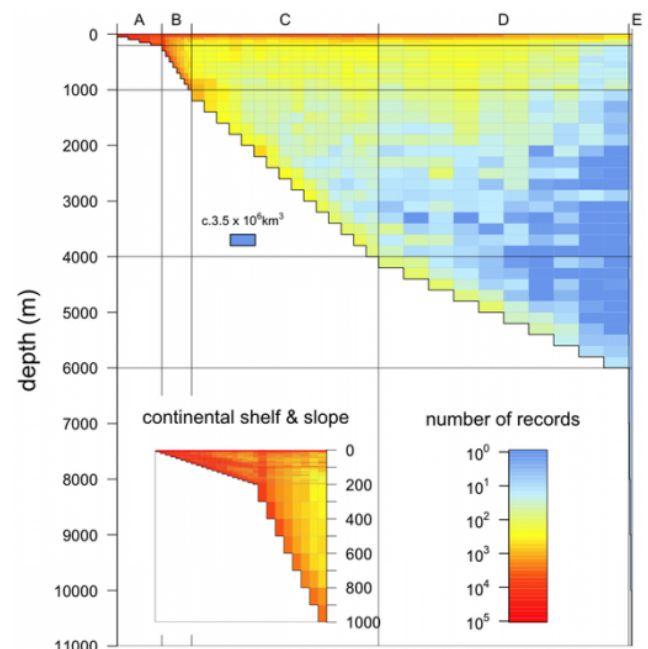


Figure 1: Scaled cross section of the depth of the global oceans and the data we have for each depth

Definition of Key Terms

Biodiversity

As defined in the United Nations Convention on Biological Diversity, biodiversity is the “variability among living organisms from all sources, including, inter alia [among other things], terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species, and of ecosystems.”

United Nations Convention on Biological Diversity (CBD/UNCBD)

The United Nations Convention on Biological Diversity is a multilateral treaty signed in 1993 with three main goals: the conservation of biological diversity; the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources. Seen as a key document regarding sustainable development, this convention was ratified by all countries worldwide except for Andorra, Brunei Darussalam, the Holy See, Iraq, Somalia, Timor-Leste, and the United States of America. As the United States of America did not ratify, they have been scrutinized for their minimal action on sustainable development.

Cartagena Protocol on Biosafety

The Cartagena Protocol on Biosafety is an international agreement on biosafety adopted in 2000 after the UNCBD. The Protocol seeks to protect biological diversity from the potential risks posed by genetically modified organisms resulting from modern biotechnology. The protocol allows countries to ban imports of genetically modified organisms if they feel there is not enough scientific evidence to prove the product is safe and requires exports to label shipments containing genetically modified primary agricultural goods.

Nagoya Protocol

Like the Cartagena Protocol, the Nagoya Protocol was adopted after the UNCBD, in 2010. With the aim of achieving one of the three goals put forward in the UNCBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources, thereby contributing to the conservation and

sustainable use of biodiversity. To do so, the Nagoya Protocol sets out obligations for its contracting parties to take measures in relation to access to genetic resources, benefit-sharing and compliance. There have been concerns about the added bureaucratic and legislative will and how this may affect scientists and their research into biodiversity. Non-commercial biodiversity researchers and institutions fear exchanging material between institutions will be difficult to maintain.

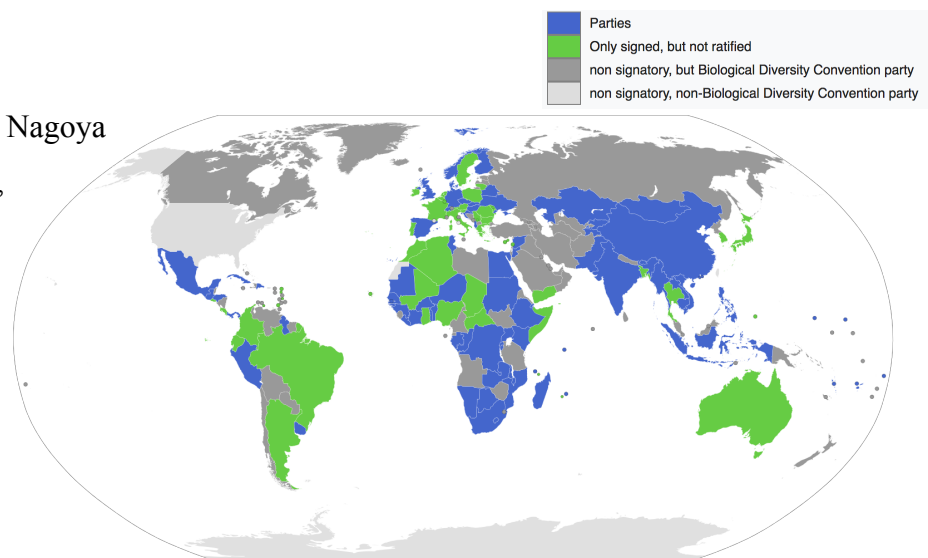


Figure 2: Signatories of the UNCBD and the Nagoya Protocol

Marine life

Marine life, or ocean life, refers to the plants, animals and other organisms that live in salt water of the sea or ocean. Marine organisms include microorganisms, algae and plants, fungi, invertebrates, vertebrates and plankton. Shorelines are in part shaped and protected by marine life, and some marine organisms even help create new land.

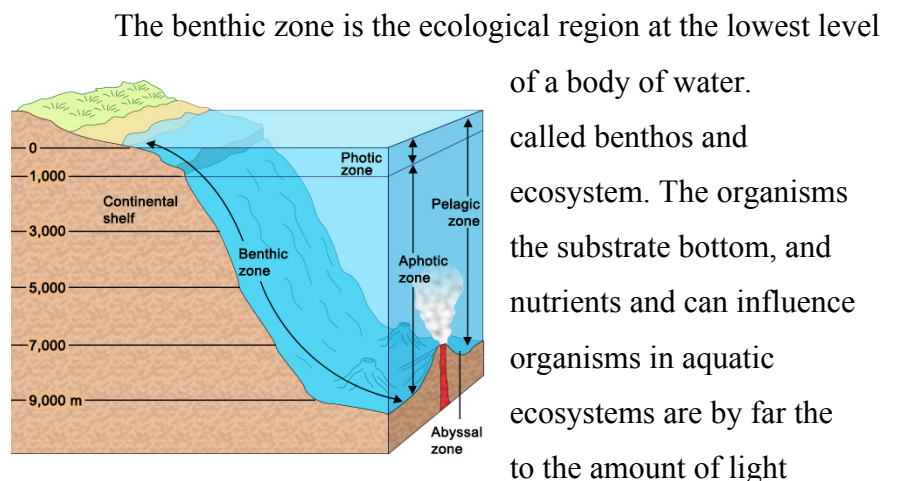
Fishery

Fishery, also known as fish farming, is the process of man-made raising or harvesting of fish. A fishery is often a combination of fish and fishers in a region, the latter fishing for similar species with similar gear types. While fishery may involve the capture of wild fish, it may also be raised through fish farming or aquaculture. Currently, over 500 million people in developing countries depend on fisheries and aquaculture to satisfy consumer needs.

Benthic Zone

Chart of the location of the benthic zone

Organisms living in this zone are collectively, referred to as a benthic. They are almost permanently attached to the substrate and they control the flow of energy and food resources on fish and other ecosystems. Benthic marine life is richest in terms of biodiversity due to light penetration, and higher diversity of biotopes.



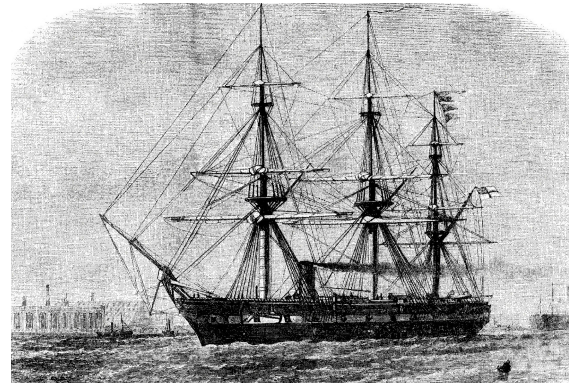
General Overview

History

In order to reduce the industrial impact on marine biodiversity, it is important to apprehend the evolution of these creatures and what scientists have researched and studied in the past. Understanding the technological advancements of industrial mechanisms and when they were introduced will also play a key part in solving the issue.

19th Century

Edward Forbes, a British naturalist, is generally regarded as the pioneer of marine biology. This sparked an age of exploration consisting of many voyages that contributed greatly to the knowledge gained about life in the oceans. The HMS Challenger



*HMS Challenger during its first expedition
1872-1876*

was an especially important expedition, where findings were made of unexpectedly high species diversity among fauna. Though many important discoveries were made, the explorers were limited due to their lack of technology to explore the deep seas.

20th Century

In the 20th Century, we witnessed many technological and scientific developments including the airplane, the rocket, electronics, atomic power, antibiotics and insecticides. The world became increasingly industrialized and the standard of living rose, the GDP per capita rising to about 135 in the USA, due to these developments. With the development of technology such as sound navigation ranging, scuba diving gear, submersibles and remotely operated vehicles allowed marine biologists to discover and explore life in deep oceans that was once thought to not exist, thus there has been more increase in marine life species due to the industrial revolution of the 20th Century. The prominent Woods Hole Oceanographic Institute, a nonprofit research organization dedicated to the study of marine science, was also founded in this century. Woods Hole Oceanographic Institute scientists travel the world trying to answer questions about climate change and conduct research that can be available to other scientists. However, with these developments, there is also an increased level of pollution.

Problems Raised by Industrialization

Effects on the food chain

Human activity has depleted ozone, increasing exposure of organisms to ultraviolet radiation. The exposure to ultraviolet radiation effects the motility and orientation of phytoplankton,



*Figure 3: Walrus cows and yearlings
(short tusks)*

resulting in a decrease in survival rate for these plankton. Phytoplankton and zooplankton form the bottom of the oceanic food chain, and provide energy and food for many larger mammals and fish. If these plankton were to become endangered, this will result in a butterfly effect. The fish above them in the food chain would lack food, which would decrease their population and this effect would be carried up all the way to the top of the food chain.

Overfishing/Fisheries

Many species are also under the stress from overfishing and habitat loss. Overfishing a certain species will make the food chain unbalanced and large fish will have difficulty finding a source of food. Fisheries also affect the food chain as they target a few specific species of fish, and therefore there is often an imbalance in the number of predators/ prey in the ecosystem. More than 85% of the world's fisheries have been pushed beyond their biological limits-more fish are being fished than the fish can replace through natural reproduction- and are in need of strict management.

Acidic Oceans

After absorbing a large proportion of the carbon dioxide released by human activities (on average approximately 0.9 kg per human), the oceans are becoming increasingly acidic, from approximately pH 8.25 to pH 8.14. As increasing acidity makes extracting dissolved oxygen from water more difficult for gilled marine animals, many species are suffering the negative impacts of ocean acidification. Shellfish, crabs, lobsters and corals may also find it more difficult to build their calcium carbonate shells. Coral are important to the ecosystem and many fish hide, find food, reproduce and raise their young in these coral reefs. The calcium carbonate shells of conch species such as the Caribbean snails have started to dissolve. The spines of tropical pencil urchins also started to dissolve.

Eutrophication

Eutrophication occurs when an excess of chemical nutrients -- typically compounds containing nitrogen or phosphorus -- enter a body of water. It is usually due to the leaching of fertilizers from nearby agricultural and farming areas. Fertilizers are needed in the agriculture industry in order to supply nutrients to crops and enhance their growth. On average, 151 kg of fertilizers are consumed per hectare of agricultural land in the EU. The fertilizers often result in the blooming of algae resulting in an increase in the ecosystem's primary production. There is also increased competition for resources. The high degree of competition make struggle for survival in eutrophic conditions difficult and result in excessive plant growth and decay, which lowers the biodiversity

of the ecosystem as only certain species of fish will survive. Further effects including lack of oxygen and severe reductions in water quality, fish and other animal populations. This also creates an anoxic zone (an area with no oxygen due to the decomposers that use up all the oxygen), often leading to the death of all marine life that depend on aerobic respiration.

UN Involvement, Relevant Resolutions, Treaties and Events

The UN Convention on Biological Diversity (CBD/ UNCBD), as mentioned before, is a multilateral treaty with goals to conserve the biological diversity in the world. This is relevant to the topic, especially the other protocols the follow as it is a previous attempt to decrease our impact on biological diversity, putting into action both the Cartagena and the Nagoya Protocol.

The notion of this conference was prompted by the United Nations Environment Program (UNEP) a group of experts working on biological diversity. The convention reminds us that natural resources are not infinite and sets out a philosophy of sustainable use. While past efforts were aimed at protecting particular species or habitats, the CBD recognizes that this must be done in a way that does not affect the biodiversity of species.



Official Logo of the UNCBD

Attempts to solve the issue have been discussed in resolutions.

In June 2015, the United Nations (General Assembly) adopted resolution 69/292 regarding the topic of development of an international legally binding instrument the United Nations Convention on the Law of the Sea (UNCLOS) on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction. The Ocean Conference consisted of 4 preparatory meetings focused on four main areas of focus for the treaty, considered to form a package: marine genetic resources, including questions on the sharing of benefits; area-based management tools, including marine protected areas; environmental impact assessments; and capacity-building and the transfer of marine technology.

Timeline of Events

Date	Description of event
1956	The United Nations held its first Conference on the Law of the Sea (UNCLOS I) at Geneva, Switzerland. UNCLOS I resulted in 4 treaties including the

	Convention on the Territorial Sea and Contiguous Zone, Convention on the Continental Shelf, Convention on the High Seas, and Convention on Fishing and Conservation of Living Resources of the High Seas.
March 20 th , 1966	The Convention on Fishing and Conservation of Living Resources of the High Seas was entered into force after UNCLOS I. This was an agreement designed to solve problems involved in the conservation of living resources of the high seas, considering that because of the development of modern technology, some of these resources are in danger of being overexploited.
October 23 rd , 1972	United States National Marine Sanctuary, a federally designated area within United States waters that protects areas of the marine environment with special conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, or aesthetic qualities
June 5 th , 1992	United Nations Convention of Biological Diversity is signed
December 29 th , 1993	The United Nations Convention on Biological Diversity loses effect.
November 16 th , 1994	The International Seabed Authority (ISA), an organization established by the Law of the Sea Conference, is formed. They were established to organize, regulate and control all mineral-related activities in the international seabed area beyond the limits of national jurisdiction, an area underlying most of the world's oceans.
November 16 th , 1994	The United Nations Convention on the Law of the Sea loses effect.
January 29 th , 2000	Cartagena Protocol on Biosafety to the Convention on Biological Diversity is adopted.
October 29 th , 2010	Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity is adopted.
June 19 th , 2015	Resolution 69/292 was adopted without a vote.
December 7 th , 2016	Resolution 69/292 was adopted without a vote.
June 5 th -7 th , 2017	Resolution 71/123 regarding sustainable fisheries was adopted without a vote. The 2017 United Nations Ocean Conference took place.

Possible Solutions

Precautionary Actions

Though UNCLOS includes several important initiatives for preserving political peace on the high seas, it reflects the traditional thinking of taking the maximum for the sea before considering the

negative impacts. Rather than wait for all our resources to be used up, the precautionary principle places the burden on fishermen, oil drillers, industry, farmers and whomever else would exploit the sea, intentionally or not, to avoid harming this precious resource in the first place. To reduce the industrial impact without harming current industries, it is necessary to take precautionary and preliminary actions such as regulating the number of fisheries in certain regions, before certain species become extinct.

Regulations and laws

Precautionary actions need the full cooperation of all member states. Therefore, in order to put precautionary actions into effect, a multilateral talk could help to establish a middle ground on the topic at hand. Previous attempts, such as The Fishing and Conservation of Living Resources of the High Seas imposed some responsibility for conserving marine resources. However, its chief aim was not conservation but rather limiting foreigners' access to coastal fisheries to maximize the catch available for signatory nations. There should be focus on countries who heavily rely on fisheries for national income, and putting into effect international laws that limit the number of industrial devices permitted per water bed in accordance to population density.

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