

The Importance of Protecting Marine Biodiversity

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Earth is a closed system and therefore, all of its life is interdependent, relying upon each other as resources. The more biologically diverse Earth is the better the chance all species will have for survival. Humans abuse much of the Earth's resources in order to achieve economic success. However, this success comes at the expense of humanity's future. The resources on Earth have the potential to sustain life indefinitely, if used with caution. However, when exploited, the resources can be lost forever.

Recently humans have become aware of the importance of saving Earth's precious resources and have taken action to preserve biodiversity through laws, regulations, protected areas, and funding. While the conservation actions taken thus far are positive, most of the effort was directed toward terrestrial ecosystems. The importance of conserving marine biodiversity has only been recently realized; consequently less action has been taken. This is an especially urgent concern as marine biodiversity is decreasing rapidly. Although there are many different factors contributing to the decrease in marine biodiversity the most important change needed is increased public awareness. With greater public support government and corporations could be pressured into doing more to protect marine biodiversity. Public awareness can be accomplished through educating people about the value of marine biodiversity, how seriously it is threatened, what is currently being done, and finally what still needs to be done.

Before the benefits of marine biodiversity can be explained, what is meant by the term must be understood. There are three types of biodiversity. Each type must be recognized separately, although all are dependent upon each other. The types include species, ecological, and genetic diversity. Species diversity is the number of different species present within an ecosystem. Ecological diversity is the number of different ecosystems within a larger area. A large ecological diversity allows for species diversity to be abundant on a global level. Genetic diversity is the degree to which members of the same species differ. If a particular species has high genetic diversity, it will have a greater chance of surviving as it is likely that some of the individuals in the species will be better adapted to overcome threats. Most people underestimate the vastness of marine biodiversity. Almost 80% of all species known to science are terrestrial (Thorne-Miller and Cantena,9). However, this is not as much a reflection of the diversity of marine ecosystems as it is a reflection of where human interests lie and the amount of marine research that has been done. Many scientists believe the ocean has far more diversity than land because so much marine life is undiscovered

and because, including depth, the ocean has 100 times more capacity for life (Thorne-Miller and Cantena, 9).

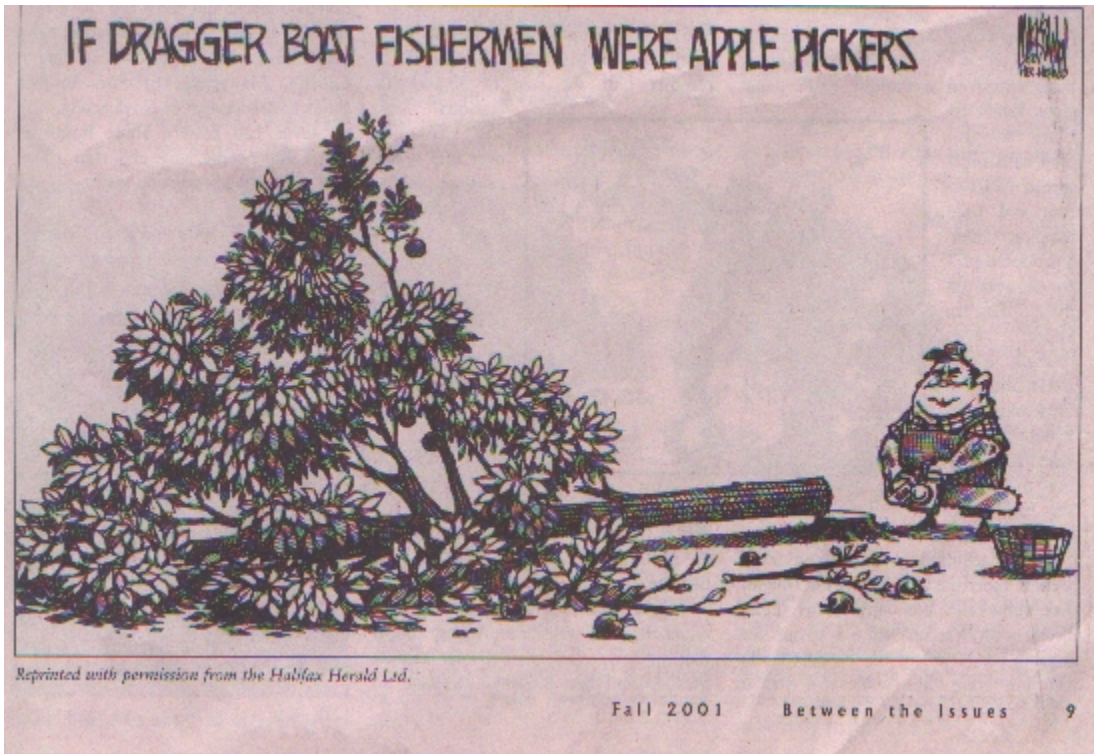
Now that marine biodiversity has been explained the benefits of it can be explored. Perhaps the biggest resource provided by marine biodiversity, is food. Throughout the world fish and crustaceans are harvested, making up an important part of the world's diet and providing economic benefit. In North America fishing is a huge industry and allows much economic success. However, it is difficult for North American people to comprehend the importance of fish as food because North America has the money to import many different types of food and a citizen could most likely go their entire life without eating seafood. However, many developing countries cannot afford to import, therefore, readily available seafood is relied on as the most important source of food. (Thorne-Miller and Cantena, 12) Six out of the top eleven fish harvesting nations are developing countries (Thorne-Miller and Cantena, 12). Any decrease in marine biodiversity will have the greatest impact on developing countries risking their primary source of food.

Another benefit of marine biodiversity is medicine. Many marine organisms give off toxins in order to repel predators or retard the growth of their competition (Thorne-Miller and Cantena, 13). These toxins can be taken from the marine organism and utilized in the development of medicines. Most current medicines come from terrestrial organisms. However, their effectiveness is decreasing as bacteria and viruses become more resistant to them. Future medicines will most likely come from marine organisms. For example, "A deadly snail from Fiji and the lowly horseshoe crab could hold keys to blood diseases" (Kay, The Boston Globe) and bacteria found on algae known as *Bugula neritina* is being studied as a promising new way of treating cancer. (Beyond 2000) If marine biodiversity continues to decline, species containing potential wonder drugs could die off.

The richness of marine biodiversity can be used to generate money through tourism as well. Coastal areas can use scuba diving, glass bottom boat rides, and whale watching cruises to make a profit.

As well, much scientific information can be gained by studying the numerous species of the sea. If the biodiversity declines, some important scientific discoveries may never be made. The Marine biodiversity of the ocean makes it one of the greatest resources for the human species. However like all resources it must be used with caution so as to remain sustainable.

Unfortunately, the resources of the sea have been over harvested by humans, threatening marine biodiversity. Numerous marine organisms have been placed on the endangered species list, and the estimated population of many marine species has greatly declined recently. The Juan Fernandez fur seal's population was in the millions and is now around 1500 (Leggett and Leggett). The blue whale had an estimated population of around 200,000 and is currently around 11,000 (Leggett and Leggett). Many statistics like these can be found showing the decrease of marine species population levels that will lower biodiversity. The reason populations are being decreased is that human activities affect all of the levels of biodiversity. Fish and other marine organisms are harvested from the ocean in very large quantities, immediately lowering biodiversity drastically. The marine organisms are being removed too often to allow for the replenishing of population levels. To further complicate the problem, the habitats where marine organisms live are being destroyed as well. The habitats can be destroyed by coastal developments, pollution, or fish trawling, which damages the ocean bottom. Fish trawlers are a major concern as they threaten ecological and species diversity at the same time. A good analogy to the damaging effects of fish trawling is an apple picker who cuts down the tree in order to get apples (MacKinnon, *Between the Issues*).



Another threat to marine biodiversity is that only a few species of fish are sought after. It is estimated that half of all fish caught are herring, cod, jack, redfish, or mackerel (Thorne-Miller and Cantena, 12). The pressures on these species make them very prone to extinction, which would be detrimental to marine biodiversity.

Aquaculture and fish ranching are activities that seem harmless but are actually very threatening to genetic diversity. Both of these actions grow fish that are larger and appear to be healthier encouraging “traits that may not be best suited to long-term environmental variability.” (Boehlert, George). It is quite likely that all the fish may be susceptible to a certain chemical or environmental change. The fish could all die off together as they are genetically very similar. Fish ranching is especially harmful because the fish are released into the wild where they mate with wild fish, reducing the genetic diversity of the entire population.

Threats to the environment that may not seem to directly affect marine biodiversity can have serious affects as well. For instance, global warming can change marine habitats before organisms have a chance to adapt. Sixty percent of the great coral reef has been bleached white because of increased global temperatures (Glausiusz, Josie). The drastic effect these threats have on marine biodiversity is very frightening. This must be seen as a major problem and changes have to be made in order to preserve marine biodiversity.

The steep decline in marine biodiversity is beginning to be recognized as a serious problem. In 1992 the convention on marine biodiversity was held, in which over 150 countries signed documents declaring their commitment to the conservation of marine biodiversity (Convention on Biological Diversity). The convention is a very large step toward preserving marine biodiversity because it is an international effort. All the oceans connect and are essentially one, as a result species and pollution are not restricted to one area, and therefore an international effort is required to change the way the ocean is treated. By signing the document at the convention, each country is legally obliged to protect all aspects of marine biodiversity (Convention on Biological Diversity). Species diversity is protected by fishing licenses, quota, and regulating alien species so they do not hurt populations of natural fish. The countries protect ecological diversity by declaring protected areas, rehabilitating degraded areas and controlling pollution (Convention on Biological Diversity). Finally, genetic

diversity has to be protected by forcing genetically altered food to be labeled (Convention on Biological Diversity).

Since 1992 more than 175 countries have joined the Convention on Marine Biodiversity. The convention holds meetings quite regularly and establishes committees to deal with various issues concerning marine biodiversity. One of the most successful committees is the Global Environment Facility or the GEF. The GEF provides financial support to companies or organizations that help maintain marine biodiversity either directly or indirectly. (Convention on Biological Diversity). The convention and its combined world efforts are a step in the right direction however much more needs to be done.

Biodiversity is declining very rapidly and efforts to stop the decline must be intensified. There needs to be more public support in order for true change to occur. An advertising campaign could be started that instills a sense of responsibility in the public. Hopefully, the public will realize that if they choose to buy products that are environmentally friendly, more companies will be encouraged to act in an environmentally responsible manner. If consumers support these companies and the GEF program continues financial aid for them, it may become unprofitable to deplete biodiversity. Increased public support could speed up this progress causing more money to be allocated to programs such as the GEF and efforts to establish protected areas. Politicians essentially want to please the public, so support of marine biodiversity could encourage politicians to increase funding. Some of this money should also go into the development of new technology, which does not damage ecological diversity, and existing positive technology should be used more. For example the hook and line fishing technique should be encouraged more than trawling, which is far more detrimental to marine biodiversity.

Finally, more important than all of these changes, is the education of children. By passing knowledge and appreciation of marine biodiversity to future generations great change can be realized. Racism is a good example of how attitudes can be changed. By passing acceptance and fairness on through generations, attitudes have changed a great deal. A change this drastic must happen for environmental concern as well. Educating children is the most important step in preserving marine biodiversity, as the future of our planet lies in their hands.

In conclusion, marine biodiversity is essential to the survival of all life and the public needs to be made aware of this. Life in the ocean is declining rapidly and we have little time left to halt the process. While researching this topic, my attitudes toward marine biodiversity changed drastically; I felt as if a cloud of ignorance had been lifted from me. While writing this essay about changing attitudes in people I experienced that very change myself. A little education can do much in changing the views of the nations.

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