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Mass Extinction in Progress

by Nick Kontos

(Biology 1110)

Our precious planet has experienced five major extinctions, and human beings are currently causing the sixth mass extinction of species. If present trends continue, one half of all species of life on earth will be extinct in less than one-hundred years. This results from habitat destruction, pollution, invasive species, and climate change. The resulting biotic impoverishment threatens our food supply as we are dependent on the services wild life supply like pollination and pest control. The extinction of one organism serves as a domino effect causing the disappearance of multiple organisms (Ehrlich and Ehrlich 1981). This paper discusses the importance of preserving biodiversity and the effects of global warming on species. Solutions will be explained.

Preserving Our Biodiversity

Centuries ago, the earth was a wilderness in which humans had yet to leave their mark on. In the 1800s, the world experienced the start of agriculture and industrial growth, which improved the quality of life. However, growth has been done without concern about the natural environment. The United States was one of the first nations to notice the distractions of the environment in creating the first National Park in 1872 Yellowstone (Miller 2008). By 2000, our national park systems protected 391 regions covering 83 million acres and our wildlife refuges protected 547 areas covering 93 million acres. These national parks and wildlife refuges offer a safe shelter for thousands of species, including 400 endangered species. Species such as wolves in Yellowstone, coho salmon at Point Reyes National Seashore, and sea lions at Channel Islands National Park depend on the park areas for their survival (Miller 2008).

Nevertheless, even these protected areas are under attack today. Many parks in the U.S are poorly funded, limiting the ability of park managers. There also small and the surrounding areas are needed for the animal's survival. The development of commercial and residential real estate has expanded along the borders of the national parks, which have eliminated the surrounding habitats. Not only has this caused widespread water, air and soil pollution around and in the parks, but has caused humans to collide with endangered species, putting them in greater danger of extinction. The forest ecosystem and the species that exist in them have a very important relationship. They depend on one another for survival. The increased use of parks for resource exploitation has contributed to the extinction of species and deforestation. We need to reconsider if resource exploitation in national parks should be off limits.

Numerous countries understand the severity of species extinction and resource exploitation, and are fully committed through international treaties to protect irreplaceable assets. Parks, wildlife refuges, natural preserves, zoos, and restoration programs have been established to protect nature and rebuild depleted populations (Cunningham and Cunningham 2008).

Foods, Medicines and Natural Products

Nature provides us with sources of food yet unexploited. In total, humans use only about 150 species of plants for food, out of 80,000 potentially edible plants (Cunningham and Cunningham 2008). Because we depend on such a narrow range of plants, our ability to produce and sustain food crops is imperative for human survival.

The most powerful and affected drugs for cancer today, has come from nature. The pharmaceutical industry had revenues of \$359 billion in 2000 and \$180 billion came from products developed from living organisms (Clover 2006). Recent studies prepared by the United Nations Environment Program (UNEP) have revealed that one potentially lifesaving drug is lost every two years as a result of plant and extinctions. The loss of biodiversity will have a massive impact on medicine and healthcare around the world.

Aside from food and medicine, the natural world also provides us with raw materials for much of our clothing, household goods, and cosmetics. The world's forests produce pulp for paper products and wood for construction of homes and furniture.

Specie Extinction Is Increasing Due to Global Warming

Scientists predict by 2050 rising temperatures caused by carbon dioxide and other greenhouse gases could affect more than a million species. Their research revealed that 15 to 35% of the 1,103 species will be at risk of extinction. The researchers based their study on minimum, mid-range and maximum future climate scenarios based on information released by the United Nation's Intergovernmental panel on Climate Change (IPCC) in 2001. The IPCC predicts that temperatures are expected to rise from somewhere between 1.5 and 4°F (Ellis 2004). Taking action to unsure the climate ends up on the low end of the range is vital to prevent catastrophic extinction.

While global warming threatens all types of species, the potential impact to endangered species already on the point of extinction is especially horrible because they have less ability to bounce back when hit by new threats from global warming.

The sea turtle is a disturbing example of the effect of global warming. Found on both coasts of the United States and the Gulf of Mexico. All six species of sea turtles are listed as either threatened or endangered and with good reason. The temperature of the water will determine the gender of unborn turtles. A rise of just 1°C would lead to more females being born than males. With fewer males available for breeding, entire populations of sea turtles could be wiped out within a few generations, if we do not act now to control global warming.

The warming of the earth's ocean waters around the Antarctic Peninsula is responsible for the dramatic decrease in Adelie penguin populations. The last 25 years show a decline of 33% due to the changes in their ice environment, while Adelie penguin populations have decreased 40% over the last thirty years (Ellis 2004). The decline in these populations is caused by the decline in the penguin's main food source, Antarctic krill. Less ice results in fewer algae, which is the primary food source for krill. Both adult and young penguins have difficulty surviving. Several breeding colonies in the area have disappeared altogether.

The polar bear is the largest of the worlds bear species. Polar bears live only in the Arctic and are completely reliant upon the sea ice for survival. Polar bears use sea ice for virtually all of their essential behaviors including feeding, mating and travel. Polar bears are threatened with death because global warming is causing fast environmental change in the Arctic, including the melting of the polar bear's sea ice habitat. This powerful animal cannot survive the loss of sea ice habitat that will occur if current levels of greenhouse gas emissions continue. Scientists that study the Western Hudson Bay have witnessed the impacts of global warming on polar bears. They have already recorded thinner bears, lower female reproductive rates, and decline in baby polar bear survival.

The unique Edith's Checkerspot Butterfly is also feeling the stress of global warming. It is forced to abandon its habitat due to warmer climates and is know in disparate search for cooler climates. Edith's Checkerspot is well known for its extreme sensitivity to slight climate changes. In Western regions where the butterfly had flourished, it was unsuccessful to maintain its territory because of rising temperatures. Several escape to higher elevations in Southern regions in search of cooler climates, but most migrate northward. In fact, studies show that 63% of butterflies have shifted their ranges 35 to 240 km northward in the past 100 years (Ellis 2004). The butterflies have a

close symbiosis with a particular plant species, the migration by the butterfly may not be matched by the plant resulting in possible extinction of the plant species. It is evident that the gradual increase in temperatures that cause population migrations and extreme weather conditions will soon be responsible for the disappearance of entire local populations of the Edith's Checkerspot Butterflies and plant species that rely on the butterflies presents.

Conclusion

Current extinctions are anthropogenic in nature and threaten the world's ecosystem of which humans are part of. Habitat loss, introduced species, and over-exploitation are the main threats, with human-induced climate change becoming an increasingly significant problem. Since we have identified the root cause of the problem, it is now time to act on it before it is too late. Protected parks are a beginning to resolve the problem, but more areas need protection and global threats in the forms of climate change and pollution need to be addressed.

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