

Understanding Biodiversity

By Dr. Reese Halter

Biodiversity - the different number of life forms on planet Earth - is important to understand if we're to survive.

Scientists estimate that there are between 10 and 110 million species on Earth. So far, we have catalogued about 1.4 million forms of life. The awesome diversity that exists on our planet today represents about one percent of all species that have ever lived here.

Life began 3.5 billion years ago. Ultraviolet radiation relentlessly bombarded the planet. The thin atmosphere was a toxic mixture of hydrogen, ammonia, methane, carbon monoxide with very little or no free oxygen.

Lightning was a major force in that world of very active volcanic upheavals. Bolts of lightning hit the ocean and from one of those reactions came the beginning of life, with the formation of DNA (deoxyribonucleic acids, the main constituent of chromosomes, which carry the genetic code).

DNA is the fundamental building block of life, with power to replicate itself as the blueprint for the formation of amino acids (the building blocks of proteins). The oldest forms of life (and first fossils), bacteria, fed on carbon compounds that had accumulated in the seas. Over time, it made its own food from free hydrogen released from volcanic activity. Miraculously, there came a time when this blue-green algae developed the ability to harvest the sun's energy and use carbon dioxide in primitive green or chloro cells, thus making its own food. One major byproduct of this activity was the release of oxygen.

So much oxygen was released that some oxygen floated to the upper atmosphere and formed the ozone layer. That remarkable oxygen-rich layer filters and prevents almost all UV radiation from reaching the Earth's surface. Once this layer was in place, life on our planet began. First in the ocean, and then from the ocean to the land, life proliferated!

Today, off the coast of east Africa and western Australia there is what looks like worn-out old stumps called stromatolites that contain evidence of the first ancient aquatic bacteria dating back 3.5 billion years!

Life has amazingly adapted to many different environments. It has developed mechanisms for surveying extreme heat or cold, wetness or drought, High Mountain altitude or deep ocean depths. Each habitat, or set of environmental conditions, is home to different life that has developed mechanisms to successfully survive.

There are certain traits which each living thing possesses specially adapted to the specific environment. For example, rattlesnakes living in the desert of the

Kamloops (interior of British Columbia) region could not exist on the wet outer coast rainforests of the Queen Charlottes, British Columbia.

Species of organisms sharing a habitat live in a community or ecosystem. How organisms interact in each ecosystem is important and that's why scientists study them.

In order to carefully manage our forests we need to know how the ecosystem works. That requires balance. The West depends upon trees growing in plantations for fiber and ultimately for jobs. But we also need wild forests so that forest biologists can understand how trees work and also to maintain the maximum amount of different life forms and genetic diversity.

If we deprive a species of what they need to live, then eventually they become extinct. Globally, over the past 50 years, thousands of species have gone extinct due to human population pressures and destruction of habitat.

Conservation biology is a relatively new, exciting and challenging branch of science. The discipline is charged with the responsibility of maintaining biological diversity on our planet. Fragile ecosystems in West have been identified and are being restored with the help of dedicated conservation biologists.

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