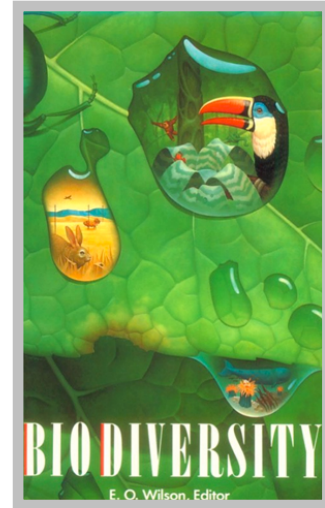

Biodiversity

by: Patsy M. Miller, Ph.D., June 2004

WHAT IS IT AND DO WE NEED IT?

Biodiversity can be thought of as the diversity of living things in a given area. Dr. E. O. Wilson in the introduction to his book *Biodiversity* does not exactly define biodiversity but he does put it into perspective when he states, “The diversity of life forms, so numerous that we have yet to identify most of them, is the greatest wonder of this planet.” Much of that wonder is slipping away from us at an alarming rate.

An article in the March 20, 2004 Scottsdale *Tribune* under the headline, “Scientists suggest Earth is close to major extinction,” reports that a survey carried out by 20,000 volunteers in England documented population declines in 201 species of birds and in 1,254 species of native plants. Closer to home, a talk presented at the Desert Awareness Committee/Cave Creek Recreation Department lecture series by A. J. Schneller, a staff member at Tucson’s Center for Biological Diversity, delineated threats to biodiversity in Arizona. Information from his talk forms the basis for much of this article.



In areas with rapid human population growth, large tracts of land are converted to human habitats (houses, shopping centers, and highways), often without leaving even remnants of the natural desert. Overgrazing, indiscriminate logging and excessive pumping of ground water can also result in habitat degradation. Loss of habitat and habitat fragmentation are the major factors in the decline of plant and animal populations. When impacted areas are home to rare species, the loss of habitat can result in the permanent loss of the species, in other words, extinction.



Arizona has a number of unusual habitats and rare species that are federally listed as either endangered or threatened. We have our own island habitats - sky island mountains surrounded by a sea of desert. These isolated areas are home to diverse ecosystems that change with elevation and aspect. Development has created additional "sky islands," isolated natural hills that are now surrounded by city. We have hot springs with unique flora and fauna and 140 miles of the last living river in the Southwest, the San Pedro River. The San Pedro flows north from Mexico into the Gila River and is one of the West's most important migratory bird corridors. Fifty percent of all of the bird species in the United States frequent the San Pedro. It is also home to 100 butterfly species, 83 mammal species, and 47 amphibian and reptile species.

This treasured strip of riparian forest is threatened by urban sprawl at Fort Huachuca and Sierra Vista where unsustainable pumping of ground water to support urban growth has reduced the water level by 75 percent in the past 50 years.

Of the 31 species of native fish in Arizona, 18 are either threatened or endangered. Their continued existence is made problematic by excessive cattle and sheep



grazing and water diversions. Protecting the Cactus Ferruginous Pygmy Owl has led to the designation of 731,000 acres of protected critical habitat in 1999 and the development of the Sonoran Desert Conservation Plan in Pima County. This local planning initiative has the goal of conserving the county's most valued natural and cultural resources while



accommodating inevitable population growth and economic expansion.

The Lesser Long Nosed Bat is another of Arizona's rare species. This bat, a critical saguaro pollinator, is capable of eating 1200 mosquitoes per hour and also dines on other agricultural pests.



All of the Mexican Gray Wolves were exterminated from the United States by the mid-1920s. They have now been reintroduced into the Gila headwaters area and are helping to restore the natural balance in this ecosystem. Re-establishment of a top predator is not without unintended impacts. The adult Mexican Gray Wolves



were born in captivity, so they have no way to know the difference between an elk and a cow. Requiring livestock operators on public land to take responsibility for removing cow carcasses will reduce the likelihood that wolves will become habituated to livestock as food.

There are many other examples of species on the verge of extinction here in Arizona and elsewhere. But one can ask, “Do we really need all that biological diversity, all those species that make up the complex web of life on earth?” Here are just a few facts.

For the past 25 years, one-fourth of all prescriptions dispensed in the United States contained active principles that are still extracted from higher plants. Plants synthesize highly complex chemical substances that have the potential for producing new drugs of great benefit to mankind (Farnsworth in E. O. Wilson). Genes from a wild tomato improved the flavor and other attributes of value to the tomato industry, estimated in 1987 to be worth \$8 million per year (Iltis in E. O. Wilson). Genes from wild rice species in India saved the rice grown in Asia from four known rice diseases; barley grown in California was protected from a virus using genes from a barley plant in Ethiopia; and the sugar cane industry in the



United States was saved using disease resistance provided by a wild Asian species of sugar cane (Plotkin in E. O. Wilson).

J. D. Nations (in E. O. Wilson) sums it up this way: “We have to acknowledge that we will never be able to demonstrate an immediate utilitarian reason for preserving every species on Earth. Some of them may have no use for humankind beyond being part of the great mystery. But who will tell us which species are unimportant? Who can tell us which level of extinction will seriously disrupt the web of life that we depend upon as human beings?”

The Center for Biological Diversity is an advocate for all species. For more information about its activities check the web site at www.biologicaldiversity.org.

