

A Look At Nature “Eye of the Beholder”

Change is always happening in nature. An ecologist friend of mine calls it “dynamic equilibrium.” There is change but also balance. Most change is of a size and duration that does not greatly alter the balance. The diggings of a pocket gopher, an avalanche or a forest fire all cause change but eventually recover and blend in with their surroundings. Other changes are long term but relatively slow. The last ice age caused major shifts in plant communities and animal distributions. It also caused the loss of some species and the development of new ones. But the time frame was slow enough that there was not a great change in total number of species.

However, sometimes the speed and scale of the alteration is so great that it totally changes the balance. When this happens there is a rapid loss of species, with a smaller number of more adaptable species able to hang on. Keep in mind that while small organisms, such as viruses, can evolve quickly, larger animals and plants, most things that we can see with our eye, require thousands to millions of years to successfully evolve. What may cause such a great change? A meteor striking the planet is one. There is a major, rapid climatic change to which many species cannot adapt.

Those who study species evolution point towards five historic global events where the rate of species extinction was much greater than the development of new species, as evidenced by fossil records. So far, meteors are considered the most likely cause in three of the five events. The last such event occurred 63 million years ago; the end of the age of the dinosaurs. After each of these catastrophic episodes it took 10 to 20 million years for the number of species to regain previous levels.

Most ecologists, including famed scientist and author E. O. Wilson, feel we are now in a sixth major event where the rate of species extinction far exceeds the development of new species. The cause this time is the rapid growth of humans, and all the ways in which we alter the land, water and air to satisfy our needs. One way that we alter ecology is through the introduction of plants and animals that did not coevolve with the site. The unprecedented rapid movement of ourselves and all our products throughout the world allows for the spread of seeds and animals, some of which will be very successful in their new home as they are without the normal host of related organisms that kept them in balance where they originated. They will eventually displace native plants and animals. While there may be an initial increase in species diversity from the new inhabitants, as the nonnative organisms increase in coverage, there is an eventual decrease in the plants and animals that were here. Habitat generalists will increase while specialists will disappear. Humans, fox squirrels, raccoons, starlings, dandelions, and smooth brome will survive; northern goshawks, western tanagers, boreal toads, two-banded skipper butterflies, mountain muhly grass, and wood lilies will not.

What is evident from fossil and pollen records is that most plants and animals found in Boulder County have been here a long time, in the order of tens of thousands of years. Some species have arrived or disappeared in relation to slow climate change. But change has occurred at the pace of geologic time; v-e-r-y s-l-o-w.

With long-term stability comes the development of specialists that are highly successful at taking advantage of a few landscape elements. Several types of butterfly have evolved into specialists. Members of the arctic, alpine and grass-skipper butterfly families are often tied to one or a few species of grass; they lay their eggs on the grass, and the emerging caterpillar will eat

only that species of grass. If the host grass species disappears, so does the butterfly. This is co-evolution.

Humans arrived in Boulder County some 14,000 years ago. This was the New World. It is possible that they had some immediate impacts on large mammals and contributed to the extinction of mammoths and saber-toothed tigers. They also had localized impacts on plants they utilized for food, clothing or tools. But pollen records do not show any significant changes to the local flora.

With the gold rush of 1859, everything changed. And the changes have only gotten greater through the present. It is probable that over the past 150 years, 50% of the ground cover in Boulder County has been converted from what evolved here for millions of years to something foreign. The changes include agriculture, homes, paving, and introducing nonnative plants. The changes are greater on the plains, where there is so little native prairie left that our state bird, the lark bunting, no longer nests in the county.

The mountains have not escaped these alterations. A federal government program caused one of the most significant changes starting in the 1930s that encouraged the planting of three nonnative pasture grasses: smooth brome, timothy and orchard grass. Many of our mountain meadows are now dominated by these grasses, as are the understories of most aspen groves. Meadows dominated by native grasses such as mountain muhly and Parry's oatgrass are now hard to find, along with the butterflies and other organisms dependent on them. The generalist butterflies and insects that can utilize these abundant nonnative grasses will prosper; the specialists dependent on the displaced native grasses will disappear.

Many noxious weeds are also found in the mountains. Canada and musk thistle, if left unchecked, will increase in dominance in wet and dry meadows, respectively. In 1998, just off of Magnolia Road I found a first high mountain patch of diffuse knapweed, a weed that has taken over millions of acres in Montana, Wyoming and the Dakotas to the point where elk will no longer graze in infested meadows. Just in the past two years, seven additional patches have been found in the Nederland/Eldora area, all related to new construction or road improvements, including our very own 6th Street bridge. Yellow sweet clover is commonly seen along roadsides, just waiting for a major disturbance on adjacent lands to spread into; yellow sweet clover is now considered as much of a problem farther north as is knapweed. Those who feel it is a nitrogen fixer should be aware that we have plenty of native plants that do the same thing; also, our native ecological systems don't thrive on nitrogen and increasing it generally favors nonnatives.

Our surrounding mountains are in better shape than the plains in terms of being a refuge for our natural heritage. I liken a good, intact stand of native vegetation to finding a Picasso or Rembrandt painting. It took thousands to millions of years to create. By adding nonnatives, we are taking a Picasso and telling a modern artist to "splatter some paint on it and let's see what it looks like." As we keep splattering, the content of the original is eventually lost.

So cherish that we live in an area where our natural heritage is relatively intact. Our mission is to learn enough about all the parts (a life-long endeavor) where we can make the right decisions about what to take out and what to leave so we can protect that heritage. Aldo Leopold once said, "The cost of an ecological education is you live in a world of wounds." The opposite is, "ignorance is bliss." We all need to take the time to learn as much as we can about our natural heritage. The special diversity of plants and animals we find here is worth trying to save.

Dave Hallock