

## “Ecosystem Services:” Essential to Life but Almost Never Considered.

First, let me define an ecosystem: It is a collection of plants and animals, including microorganisms and humans, that interact with each other and the environment. Humans and all other species depend on the system of interactions among the various organisms and the ecosystem as a whole for life itself.

Everything that early humans, and even our earliest settlers, needed to live came directly from the ecosystem. Today, that is still true although things may be altered and/or “processed” before we get them. The specific things that the ecosystem provides for humans are often referred to as ecosystem services. And sometimes these ‘services’ are further divided into ‘goods’ and ‘services.’

Specifically, here are some of the “goods” that ecosystems provide humans: Ecosystems provide us with seafood, wild game, fruits and vegetables, timber, biomass fuels, natural fibers, pharmaceuticals and industrial products.

The list of ecosystem services is even longer. Here are some of the more important ones: purification of air and water, mitigation of droughts and floods, generation of soils, renewal of soil fertility, detoxification and decomposition of wastes, pollination of crops and other vegetation, dispersal of seeds, cycling and movement of nutrients, control of pests.

So it is obvious that we get a lot of benefits from natural ecosystems, or, if you prefer, Mother Nature.

Many of the ideas for this column came from Johnnie Smith, author of “Texas Waters: Exploring Water and Watersheds.” One of those ideas was a thought experiment about humans colonizing the moon. And to make it easier, he suggested that the moon had somehow (magically) acquired water, a climate, and a physical soil structure similar to that on earth. But no living organisms. So humans would have to choose which of the millions of species of organisms we have on earth that would be necessary to take for life on the moon. And remember, we are talking about bacteria, fungi and everything up the species chain.

What are the chances that humans could select and successfully transport all the required species necessary for us to live on the moon? Pretty close to zero I suspect.

Think about this. For me to enjoy that delicious piece of salmon I bought at HEB, someone in the waters off Alaska had to catch that salmon. But before he could catch that salmon, its mother had to be able to find the spot in one of the rivers in the northwest that she had grown up in that still had everything that little fry would need to survive once she laid her egg there.

But then all the way down the river and out into the ocean, that little salmon had to have everything (in its ecosystem) it needed to survive to grow to the size it was when a

human harvested it. In other words, the salmon, while part of the ecosystem, also depends on the ecosystem.

Now HEB paid the fisherman and I paid HEB for the salmon. But who paid the river and the ocean for all the necessary conditions and services that growing salmon needed during its life? And who paid the fertile soil up in Idaho that contained all the nutrients and water and microorganisms that the potato I had with the salmon could grow up in, and even before that, the bees and butterflies that pollinated the potato bloom.

I think you get the picture. We don't ever think about all the ecosystem services provided by nature that are essential to our way of life because we don't ever have to pay for them. And these services have been available to the earliest humans and well before that.

Perhaps, if we had to pay the ecosystem for its services, even if it was a tiny amount relative to how useful it is, we might be inclined to take better care of it, our native habitat.

Of course, the ecosystem involves not only the obvious plants and animals we can see every day, but also the microorganisms we can't see everywhere, including the soil. And while these out-of-sight species might not be something we think about every day, we need to remember, as E.O. Wilson said, "they don't need us but we need them."

Unfortunately, the rate of human-caused species extinction, from mammals to microorganisms, is such that we have almost certainly reduced the potential ecosystem services available to us. And this rate of species extinction is not declining, it is accelerating. Life for us may be more difficult in the future.

Next week, a continuation of the ecological conscience discussion.

Jim Stanley is a Texas Master Naturalist and the author of the books "Hill Country Ecology," "Hill Country Landowner's Guide" and "A Beginner's Handbook for Rural Texas Landowners." He can be reached at [jstmn@krc.com](mailto:jstmn@krc.com). Previous columns can be seen at [www.hillcountrynaturalist.org](http://www.hillcountrynaturalist.org).