All Our Relations

Jeanine Pfeiffer

It is midsummer and the hummingbird feeder is sucked dry.

I take it down, scrub out the crystallized sugar at the base with a toothbrush, and refill it with fresh sugar water, something I sardonically refer to as "hummingbird crack." As nectarivores, hummingbirds' diets are high in sugars, yes, but those sugars are usually nutritionally balanced with plenty of protein from tiny insects and spiders. Hummingbird feathers are built from protein, and feather iridescence is biochemically linked to protein content. More protein, more brilliantly colorful feathers. This is why, if we truly adore our hummingbirds, we create insect-friendly habitat in our gardens, along with plenty of pollinator-friendly plants.

Standing on the porch, I call out to the hummingbirds, inviting them back. The morning is still cool, and a breeze wafts the outstretched leafy arms of my purple- and red-flowered sage, hibiscus, and buddleia (the "butterfly plant"). Moments later I'm rewarded with the sound of delicate helicopter wings whirring, as a tiny male perches and feeds. He's an Anna's hummingbird with a flashy, iridescent red skullcap, sparkling throat dickey, shimmering green jacket, and a few tiny feathers sticking out incongruously from one side of his neck, making him look like a tiny, aerodynamic ruffian. This is how I recognize him, and why I've fallen in love with him.

Living two miles up a dirt road, surrounded by oak woodlands and no neighbors within hollering distance means lovely solitude from humans, and immersion in the habitats of countless other creatures. On my outgoing answering machine, I invite callers to leave messages for a panoply of furred and feathered co-inhabitants, a list so long most telemarketers hang up in disgust. The list ends with paying tribute to "the pair of bobcats down the road," who have visited twice thus far.

One early morning, before the sun had risen, my flock of chickens erupted in a cacophony of squawks and mad fluttering, sending me racing into the backyard. I scanned my flashlight randomly around until it illuminated a buff, muscular, spotted paw attached to the top of the coop.

Slowly moving my flashlight downward, the paw became a bobcat, its right front leg oddly extended above its shoulder, as if it were testing out a backhand serve on a feline tennis court. It took a few seconds to figure out the bobcat was hanging by one claw at the far end of our low-slung chicken run, accidentally caught while trying to escape. Kind of hilarious. That is, hilarious until the bobcat issued a deep-throated, chill-inducing snarl. Then it was not.

"Well, all righty then," I muttered, backing away from the coop. "I'm going inside now, where I'll be thinking about what to do, and I'll just leave you out here to figure out what you want to do, too."

I did, and the bobcat did, and when I ventured back into the chicken yard some heart-pounding minutes later, the coop was empty. I placed the few chickens I could echolocate in the dark into a cage in the garage and dragged myself back upstairs, depressed from the loss.

A few hours later, when the sun came up, I trotted back downstairs to feed my diminished flock. A cluster of feathered, softly clucking hens greeted me, perched on top of the trashcans. Astonished, I did a headcount. All girls were present and accounted for, unscathed. Apparently the rooster successfully defended the entire flock—giving the hens enough time to scatter to higher ground—yet lost his own life in the process.

Perhaps the stuck-claw episode was negative enough to keep bobcat from returning, allowing the escaped hens to survive the night. With relief in my voice, I coaxed everyone back into the coop with a fresh scoop of chicken feed, and locked the door.

At my second bobcat encounter, several months later, I rushed into the chicken yard after hearing the chicken distress call, brandishing a rake above my head and yelling. My actions were

premised on animal behavioral theory that said to look as big and threatening as possible when confronting a member of the leonid clan. Of course this made no difference to bobcat, who was operating on a different set of cultural guidelines and feline theory. Bobcat stared insouciantly back at me, and then casually sauntered off into the surrounding brush.

With bobcat gone, I turned back to survey the chicken yard damage. I saw one of my black Australopes, Zoe, with her neck caught in the fence, nailed trying to make it back to safety. Although I arrived within a minute of the avian alarm, in Bobcat Standard Time, that meant belatedly. There was no way the current rooster—an arrogantly handsome Langsen with a mean streak—could have prevented the kill.

I decided to make the most of a bad situation—if a bobcat gives you dead chicken, make roasted chicken—and plodded back upstairs to watch an online video with explicit footage demonstrating how to scald, pluck, and butcher newly dead fowl. The guy in the video made it look really straightforward, especially if you had an extra-large pot and several hours of focused attention to devote to such a wholesome, do-it-yourself kind of activity.

After carefully reviewing all the steps, I decided I had the equipment and the fortitude, but not the time. Instead, I brought Zoe to the woodland slope where I knew various carnivores hung out. I tossed her over the edge with a pinch of tobacco, and called out a heartfelt plea to the bobcats: "I know you need to eat. But there's plenty of food in these hills! Could you guys *please* seek your prey elsewhere?"

The sacrifice appeared to work: the attacks ceased.

My chicken-farming neighbors have all experienced predation from raccoons, possums, weasels, skunks, coyote, bobcats, mountain lion, and bear. Some give up chicken farming after their flock is decimated; others haul out shotguns. Me, I can't blame the predators. My egg-laying, odiferous flock is a powerful attractant, and chickens are easy prey. So I reinforce the chicken coop against all potential beasts of tooth and claw (except bear, because

everyone knows there is no such thing as a bear-proof coop), and only allow the flock to free-range in the yard when I'm at home. Each year I raise another group of pullets to expand the flock, knowing that we'll lose a few hens in the process. I call this my "wildlife tax"—the cost of living in someone else's home territory.

Learning to live relatively peaceably with our human neighbors is a hallmark of what we call "civilization." I would extend this definition of civilized life to include the ability to live peaceably and respectfully with other, non-human creatures, emulating the Native philosophy of *all our relations*.

Because we are all related.

Thanks to the wonders of molecular biotechnology, we know that 98.9% of our genetic sequence is identical to an orangutan's genome. Eighty-five percent of my DNA maps onto deer mouse DNA. A third of my human genes is shared with tree genes.

What if we acknowledged that our family tree extended beyond *Homo sapiens*? What if our evolution as humans was measured by how graciously and profoundly we related to the living world around us?

Non-human creatures enhance our lives in countless known and unknown ways. I breathe oxygen-rich air because of all the plants, algae, and lichen photosynthesizing around me. I avoid indoor pollution because thousands of tiny stomata, bacteria, and microbes on my indoor plants filter mold and toxins from the air. I eat apples from the tree sheltering my deck because bees pollinated the flowers. I have fertile garden beds because enterprising worms aerate the soil, paving the way for millions of other tiny organisms to move through underground highways, converting soil nutrients into plant food. I have heat in my home from kindling and firewood provided by ancient oak and madrone trees periodically dropping their branches. I drink from our well because the surrounding hillsides, held in place by millions of tree roots, retain water. I gain essential vitamins, proteins, and medicine from seaweed, acorns, bay nuts, miner's lettuce, abalone, mussels and hundreds of other native species who flourish in the wild, and who produce enough

to share if I am judicious with my harvesting. I am thrilled when an intricately-patterned moth or liquid-eyed deer crosses my path.

I do not have to pay for any of these gifts, which environmental scientists refer to as ecosystem or environmental "services." If I am a wise human, I will protect these gifts with my life, because these gifts *enable* my life.

Ecologically-minded farmers plan for pollination, predation, infiltration, and decomposition. We construct our landscapes to mimic natural food webs (allowing many different critters to feed on many *other* different critters) and complex habitats (allowing a diverse array of critter real estate options). We grow a wide range of plants that flower and fruit at different times, so the bees always have pollen and nectar. We plant an extra 10-20% in anticipation of hungry avian, mammalian, or insect pests. By doing so, we reduce our overall risks, especially when we grow "trap crops"—plants specifically chosen to attract pests to one portion of the garden, or field, so that other plants are left relatively unharmed.

Vast fields of a single crop—monocultures—have been described as an "all-you-can-eat buffet" or "one-stop-shopping" for pests, and don't make ecological sense. Whenever we mix things up, for instance, planting different types of crops (polyculture) next to each other, we make it harder for one type of pest to do unmitigated damage, and we increase the possibility of attracting beneficial predators like praying mantis, lady bugs, or spiders who will happily munch on horticultural pests. We make sure we are growing perennials with deep roots, to hold our soil in place and reduce the impact of strong winds and floods. We return everything we don't eat back to the land, maintaining detritivore-friendly compost piles and ground litter to allow industrious micro-engineers to create underground habitat for millions of microorganisms. And we feed the soil, not just the plants.

Ecologically-minded ranchers encourage native species like prairie dogs and annual grasses in pastures to create healthy soils and grassland habitat that is resistant to invasion by toxic nonnative plants like starthistle and jimson weed. If we are

particularly enlightened, we will not only take great care to protect our domesticated animals from wild animals, but also will tolerate the occasional predatory kill because those very same predators give back to us more than they take.

Two examples.

Example number one: wolves and fish.

After gray wolves were extirpated from the American West, ecosystems were dramatically altered. In Yellowstone, herbivore populations of elk and deer exploded, over-eating riparian species like willow, resulting in denuded riverbanks and increased stream temperatures. When the riparian woods disappeared, the beavers did too, and the wetlands previously maintained by beaver dams dried out, causing the insect, amphibian and waterbird populations to drop, which affected rodents, hawks, martens, and other mammals who survive on small wetland prey. With streams that were too warm and extinguished wetlands, Yellowstone lost its fish populations too.

Then we finally brought the wolves back—after decades of impassioned opposition from livestock owners who benefitted from cheap rents on public lands surrounding Yellowstone. The wolves predated on elk and deer, reducing the herbivore pressure on streamside trees, allowing tree populations to increase. When the trees came back along the riparian corridors, the beavers reappeared and started building dams. Beaver dams created ponds, and ponds turned into wetlands. With more vegetation and expanded waterways, water temperatures dropped and the fish returned.

These positive impacts are merely the beginning: the more obvious changes. To draw a complete food web for the Yellowstone wolf, we would need a busload of hyper-enthusiastic graduate students inscribing a chalkboard with thousands of species' names and arrows going every which way; a scientific graffiti of endless biological and ecological connections.

Biologists monitoring the re-introduction of wolves to Yellowstone have been astounded by the magnitude of the positive,

repercussive impacts of their return. We knew the wolves were important, we knew they would bring about healthy biological changes, and we eagerly awaited their return. But we had no idea of how rapidly, thoroughly, and extensively their presence could restore habitats and ecosystem functions lost to Yellowstone for almost a century. Bring the wolves back, and almost like magic, multi-layered habitats recover, and hundreds of species thought to be lost or threatened return with vibrancy and force.

No wolves, no fish.

Example number two: mountain lions and Lyme disease.

Lyme disease, with symptoms ranging from a brief case of the flu to chronically debilitating pain and partial paralysis, is caused by the bacterium *Borrelia burgdorferi*, which is spread by ticks, most especially the blacklegged, or deer tick. These bacteria are more frequently transmitted by the tick in its almost invisible nymph phase (when it is about the size of a poppy seed), than by the tick in its more visible adult phase (when it attains the size of a sesame seed). As their common name implies, these ticks preferentially feed on deer, and Lyme disease outbreaks have been linked to areas where deer populations have recovered or increased. But scientists discovered that cases of Lyme disease continued to increase even after deer populations stabilized. So it wasn't just the deer who were serving as hosts. Something else was going on.

Deer ticks are also found on smaller mammals: mice, shrews, moles, voles, and chipmunks. Red fox, who eat mini-mammals, are adept at keeping these more numerous tick-hosting populations in check. When mountain lions are present as the top predator in an ecosystem, foxes do their thing and mountain lions do their thing, because the two species rarely compete for prey (mountain lions usually go for larger mammals). But when mountain lions are removed, a new top predator emerges: the coyote. Because coyote dietary preferences overlap more closely with red fox diets, coyotes see red foxes as a threat, chasing them down and killing them. Fearing coyotes, red foxes won't even build dens within coyote territory. And because foxes proportionally consume more

small mammals than coyotes, when foxes leave, small mammal populations increase, tick numbers go up, and humans suffer more from Lyme disease.

Mountain lions tend to roam over extensive territories. Estimates vary, depending on the terrain, vegetation, and amount of prey available. Female mountain lions need at least ten square kilometers. Males need twice as much, and can range as widely as a thousand square kilometers. When we shoot a mountain lion because we're pissed off that it killed a cow or a chihuahua, we're endangering our own health and that of our neighbors' in every direction as far as we can see, because we are disrupting the natural order of the surrounding ecosystems. If we do not care, or if we indiscriminately kill top predators, the repercussions return to haunt us.

They bite us in the ass.

In university I was taught to scientifically classify organisms within the Tree of Life, dividing them into Kingdom, Phyla, Class, Order, Family, Genus, Species—a series of evolutionary events leading to us, the top-of-the-food-chain humans. In many ways this is helpful. In other ways it is not. Categorically separating ourselves from life-giving biota is potentially a suicidal act. We have another choice.

When my Native California friends speak of Salmon Nations, they are not only referring to their tribal identity and their dependence on salmon. They are also speaking of the salmon people who return to spawn in sacred waterways: the Chinook, coho, chum, pink, sockeye.

The Gwich'in believe they share a heart with the Caribou Nation, and treat the caribou, and their ancestral habitats, accordingly. In the mid-West, the Lakota speak of the Rock Nation, the oldest nation. Other tribes speak of the "little people" when referring to underground biota we know as soil microorganisms.

When we humans place ourselves on the Tree as just another branch, and consider other life as compatriots and partners, they change from "not us" to "us."

All our relations. ∞