

# World's Wilderness Succumbs to Man and Machines

LEON KOLANKIEWICZ

## WHAT IS WILDERNESS?

*A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.*

—Sec. 2(c), Wilderness Act of 1964, 16 U.S.C. 1131 et seq.

To live beside a remote salmon stream in Alaska during spawning season is to live in close proximity with *Ursus arctos*, the intimidating grizzly or brown bear, in the taxonomic order Carnivora. As a human being in the taxonomic order Primates — lacking the claws, jaws, canines, and brute size of this particular carnivore — the powerful grizzly's close proximity instinctively commands one's attention.

Grizzlies often commanded my attention during the years I worked tagging and counting Pacific salmon in the Alaskan wilds for the Alaska Department of Fish and Game (ADFG). And not infrequently, they provoked something far more intense: raw, visceral dread, a primordial fear that numbed my brain, froze my fingers, and turned my knees to quivering jelly. We human overlords in the era of *Homo industrialis* are not accustomed to having our dominance challenged by the shaggy beasts from which our ancient ancestors sought protection huddled beside flickering Pleistocene campfires, or sheltering and shivering in cold caves.

---

*Leon Kolankiewicz is a long-time environmental scientist, planner, and author. He has been an environmental consultant to the U.S. Departments of Energy and Agriculture, Army Corps of Engineers, NASA, NOAA, U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service. He is the author of Where Salmon Come to Die: An Autumn on Alaska's Raincoast.*

Never far from my mind was the realization that both of my ADFG bosses had been forced on two separate occasions to shoot and kill grizzly bears charging at them. Their furry foes dropped dead mere feet away. And I personally knew folks who'd been, in the choice words of one of my bosses, "chewed on" by grizzly bears, fortunately none to the point of disfigurement or permanent disability. But it weighs on you.



One night, the tranquility of my canvas tent was shattered by a bloodcurdling cacophony of deep roars, grunts, and growls outside, down by the salmon stream some thirty yards away, all too close for comfort. Unable to withstand the suspense, I slipped into my hip waders, grabbed a lantern and flashlight, and tightly clutched my 12-gauge shotgun, loaded with one-ounce lead slugs and buckshot. Then I stepped out of the relative coziness of the lantern-lit tent and into the gloomy night, darker yet for the dense canopy of ancient, interlocking Sitka spruces, and western hemlocks towering overhead.

I walked anxiously toward the gurgling water-

course and the piercing bellows. At least they came from across the stream — a bit more of a buffer in any onslaught. Shining my flashlight in that direction, I saw two sets of bright orange eyes glaring vividly back at me from the blackness on the opposite streambank. Then one set of eyes blinked out as that bear turned to face its adversary. It roared like a lion, and then charged its foe, judging from the sound of crashing foliage and snapping branches.

Satisfied that my partner and I were not the target of these combative bellows, I turned to go back to my beckoning tent, knowing full well that its thin canvas fabric provided scant protection from 5-inch claws that meant business. That night, like many others, I slept with my loaded gun by my side.

Yet just before I left the streambank, my gaze darted upward, and suddenly I caught sight of the aurora borealis, the fabled northern lights, dancing sublimely and silently in the fissure of sky exposed where the stream cut a swath through the dense forest canopy. Ribbons and curtains of exalted, ethereal green light swayed and twisted silently in the starry heavens, as charged particles riding the solar wind were deflected by the Earth's magnetic field and collided with molecules in the upper atmosphere. This celestial spectacle was aloof, utterly indifferent to one observant, appreciative human and two oblivious grizzly bears clashing over fishing rights.

I stood for awhile, shivering but entranced by the legendary aurora borealis and the two grumpy brown bears rumbling across the stream. And I thought to myself, *this* is quintessential Alaska. *This* is authentic wilderness.

Alas, authentic wilderness is disappearing rapidly around the globe as 7.6 billion human beings — plus our proliferating tools, machines, and emissions (our “ecological footprint,” in sum) spread to every last nook and cranny of a once glorious and now beleaguered biosphere. Once bursting with biodiversity, it now bursts at the seams with human beings, all our “stuff”, and our prodigious output.

What is wilderness? In essence, it is an ecosystem ruled more by Nature than by Man. A natural area “untrammeled by man,” in the lofty words of the 1964 Wilderness Act, a wild place with few people or no people at all. A refuge for other creatures that has not yet yielded its treasures and secrets to our own rapacious, voracious species that refuses to recognize either sacred spaces or limits to growth.

### **ACTUAL WILDERNESS VS. ‘DESIGNATED WILDERNESS’ IN AMERICA**

My experience above with the grizzly bears and northern lights took place in the West Chichagof-Yakobi Wilderness Area of Alaska's Tongass National Forest,

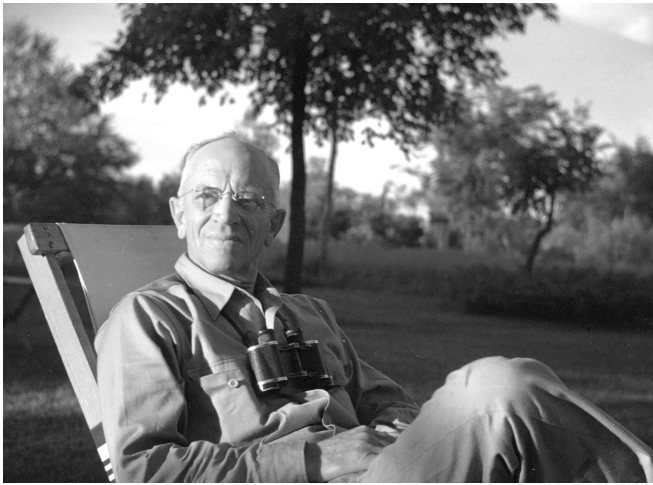
within the Alexander Archipelago, better known to Alaskans as Southeast Alaska and to Americans in the Lower 48 contiguous states (who can't conceive of any part of Alaska as “southeast”) as the Alaska Panhandle. This place is an officially designated wilderness area as well as de facto wilderness, a place where indeed Nature, or the Creator if you will, and not Man, reigns dominant.

Since the passage of the landmark Wilderness Act half a century ago in 1964, congressionally designated and officially protected Wilderness Areas have expanded tremendously in the United States. There are now about 765 Wildernesses set aside, encompassing approximately 109 million acres. (I've always loved that quaint expression, “set aside,” frequently used with parks, refuges, sanctuaries, wildernesses, and other protected areas. Set aside from what, you might ask. Well, from the path of “progress,” or out of harm's way from the human juggernaut.) This represents 4.4 percent of the land area of the United States which is officially protected as Wilderness, a magnificent conservation achievement, even if it also means that more than 19 out of every 20 acres in the country are still open for business, available for human use, and abuse.

Mind you, de facto or genuine “wilderness” has not actually increased since the Wilderness Act; just areas officially recognized and protected as “wilderness” have. There can be a big difference between actual wilderness and “designated wilderness.” Many designated wildernesses have already been profoundly and permanently impacted by humans: by noise; air and water pollution; habitat damage from previous logging, mining, grazing, and farming; and species extinctions or extirpations (eliminating a species over a large area without rendering it extinct). The desire, then, in protecting these non-pristine wildlands as officially designated wilderness, has simply been to give them a chance to recover as much of their natural character as possible, or to “rewild” them, in visionary conservationist Dave Foreman's coinage.

Some years ago I backpacked for several days in America's first ever designated Wilderness Area, the Gila Wilderness, in an isolated corner of southwestern New Mexico. The Gila had been established in 1924 at the urging of ur-conservationist Aldo Leopold when he worked for the U.S. Forest Service. While backpacking there, I remember feeling dispirited at the sound of virtually non-stop, long-distance jet traffic high overhead. As soon as the noise from one plane traveling from east to west receded in the west, the next one would start up in the east. The noise volume was not loud enough to interfere with speech or hearing bird song, but definitely loud enough to disrupt the Silence and obliterate any sense of genuine solitude. Was I too much of a wilderness purist to enjoy this beautiful place?

America's original wilderness at the time of initial European contact and conquest half a millennium ago was not devoid of humans, of course. At very low population densities (except for Mesoamerica), hundreds of tribes of Amerindians had inhabited the continent for more than ten millennia, since their Paleolithic ancestors had trekked across the frigid Bering Land Bridge (Beringia) from Asia. This natural causeway connecting eastern Siberia and western Alaska appeared during the last Ice Age, when so much of the world's water was frozen as thick, sprawling continental ice sheets and glaciers that world sea level stood some 300 feet below the present level.



Wilderness activist and "Land Ethic" advocate Aldo Leopold (1887-1948)

These earliest inhabitants of North America — primitive hunters and gatherers — proceeded to do what the first human settlers did to every continent they colonized since departing Africa some 50,000 years ago: wipe out the megafauna of the new territories they reached, most of the really big critters. This was repeated again and again across vast swaths of Eurasia, South America, Australia, and New Zealand. All of our ancestors participated in this protracted slaughter; their survival and the peopling of the planet took place at the expense of countless other astounding creatures. The "Ascent of Man" (the title of British mathematician and historian of science Jacob Bronowski's popular 1973 public television series and book) consisted in part of climbing a mound of bones of the countless creatures we vanquished as prey, predators, or competitors.

Here in North America, in an unprecedented "cataclysmic extinction wave," the mammoths (two species — Columbian and woolly), mastodons, giant sloths, giant beavers, giant condors, dire wolves, camelids, saber-toothed cats, American lions, giant tortoises, giant short-faced bears, stag-moose, and even a giant species of salmon — the saber-tooth salmon, which measured nine feet in length! — all vanished swiftly and permanently

from the face of the Earth in the wake of the human onslaught, leaving behind only fossils. (In Siberia, frozen mammoth carcasses have been discovered as well, and edgy, curious connoisseurs have feasted on 10,000-year old mammoth steaks.) In all, in North America alone, some 90 genera of mammals weighing over 100 pounds (to say nothing of other large vertebrates) disappeared in what scientists call the Quaternary extinction event.

The degree to which human hunters, climate change, and disease are each culpable in this mass extinction event is uncertain and hotly debated by scientists, but given the documented parallel extinction waves of megafauna wherever and whenever humans extended their presence, some human role, and probably a decisive one, is undeniable. The upshot is that North American wilderness was already depauperate — that is, biologically bereft — millennia before nineteenth century Transcendentalists like Ralph Waldo Emerson began to contemplate nature, and the Hudson River School began to paint inspirational wild scenes, and pioneering conservationists like John Muir organized and advocated to save wilderness, and Henry David Thoreau postulated that, "In Wildness is the Preservation of the World."

The extent to which American wilderness was already wounded even prior to Euro-American settlement only came to light with paleontological advances in the latter half of the twentieth century. It was not a focus of Roderick Nash's classic 1967 book *Wilderness and the American Mind*, which concentrated on changing attitudes of Euro-Americans toward wildlands, from fear and contempt to expanding exploitation, and finally to appreciation and ultimately fear of loving the wilderness to death from overuse and overcrowding.

However impaired or gutted wilderness actually was from what it once was in its Pleistocene heyday, ever since the time of Muir and Teddy Roosevelt, Americans have grown ever fonder of wildlands and the solitude, beauty, and wholesome recreation they offer, as well as the refuge they provide to ever-rarer wild things like old-growth forests, virgin tallgrass prairie, flower-spangled alpine meadows, sparkling crystalline brooks, the grizzly bear and the timber wolf and the wolverine that we have annihilated elsewhere.

The Wilderness Society was founded in 1935 explicitly to promote the preservation of American wilderness. Some of the most iconic figures in the annals of American conservation have been associated with the Wilderness Society: Aldo Leopold, Robert (Bob) Marshall, Olaus and Margaret Murie, Howard Zahniser, Gaylord Nelson, and Dave Foreman.

Back in the 1990s, at the urging of Senator Gaylord Nelson, the Father of Earth Day, who served as Counselor to the Wilderness Society after his career ended



in the U.S. Senate, the Society was the only American environmental group to overtly call for reduced immigration levels in pursuit of U.S. population stabilization. Not long after Nelson passed away in 2005 at the age of 89, the Wilderness Society quietly dropped this policy. I had donated to the Society for years but at that point I stopped and have never renewed my membership. Any organization that purports to defend American wilderness and does not acknowledge and actively oppose the threat posed by unending U.S. population growth to wilderness is fooling itself and it doesn't deserve my or anyone's support.

### A DEPRESSING INVENTORY OF LOSS

The modern wilderness preservation movement, like the national park movement, began in America but has spread throughout the world. The WILD Foundation, founded in 1974 in Africa, has sponsored World Wilderness Congresses every few years since 1977, when 3,000 international conservation delegates, including bankers and corporate leaders, assembled in South Africa. Since then World Wilderness Congresses have been held in Australia, Scotland, Colorado, Norway, India, South Africa, Alaska, Mexico, and Spain. China will host the Eleventh World Wilderness Congress in 2019. Wilderness preservation has gained broad international support.

That's the good news. The bad news is that in spite of this spreading popular and political support, wilderness is vanishing rapidly around the world as the expanding human enterprise makes ever more extravagant and extreme demands upon natural resources and places ever larger loads and stresses on ecosystems. Wild country, wilderness, and wildlife are succumbing to insatiable human appetites and inadvertent impacts associated with our gargantuan ecological footprint.

Sometimes the anthropogenic stresses are all but invisible, but no less real, no less virulent, and no less tragic. A case in point is the sad story of the tiny golden toad (*Incilius periglenes*) of Costa Rica, endemic (confined) to a 1.5-square mile patch of elfin cloud forest

near the village of Monteverde. The golden toad was only discovered by science in 1964. Never very abundant, the very last one, a solitary male, was observed on May 15, 1989. None have been spotted since that date, and the toad was officially declared extinct in 2004. Herpetologists are unsure of what caused its demise, and various explanations have been suggested, including its restricted range, global warming, airborne pollution, the 1986-87 El Niño event, infection with the widespread, malignant amphibian chytrid fungus (*Batrachochytrium dendrobatidis*), or some combination of some or all of these stressors.

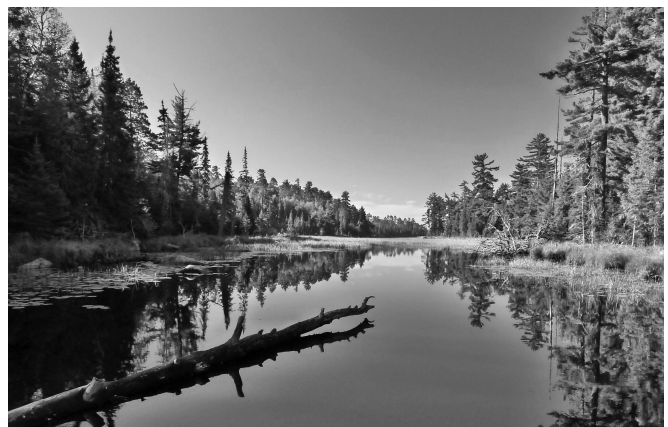
The point is that in this precarious Brave New World of the Anthropocene Epoch, no wilderness areas and no creatures living in them are guaranteed continued existence on this planet. The golden toad was a protected species, living in a protected space, and it didn't matter in the end.

In 2017 and 2018, an international team of researchers led by Australia's University of Queensland (UQ) inventoried the world's wilderness areas in both terrestrial and marine ecosystems and documented just how rare and imperiled they have become. Professor James Watson, from UQ's School of Earth and Environmental Sciences, said the findings of that research show that a century ago, humans exploited just 15 per cent of the Earth's surface for agriculture (cultivating crops and grazing livestock). Today, in contrast, excluding Antarctica, more than 77 per cent of the Earth's land surface and 87 per cent of the oceans have been directly altered by human activities. In the oceans, the only regions still unimpacted by industrial fishing, pollution, and shipping are almost entirely restricted to the poles.

I once served as a fisheries biologist for the U.S. National Marine Fisheries Service aboard a large Soviet fishing and factory ship (a stern trawler) in the Bering Sea between Alaska and Siberia, monitoring its compliance with U.S. maritime laws and inventorying its catches. The *Mys Belkina* was part of a binational fleet of bottom trawlers and factory ships harvesting two of



The haunting sound of a howling wolf is a symbol of the wilderness.



Unlogged watersheds in wilderness areas protect aquatic habitats.

the world's great commercial fish species, the walleye pollock and the Pacific cod, both bottom dwelling fish (bottom fish or groundfish). In bottom trawling, a large weighted net is dragged across the ocean floor, scraping, disturbing, and damaging benthic habitat. The nets routinely held crabs and sea stars scraped right off the ocean floor, hauled to the surface, and deposited on our deck. They also contained large numbers of other non-target fish species (bycatch or incidental catch), all dead and dying. All of this bycatch was discarded, as were unused parts of the cod and pollock cut away during processing, attracting huge flocks of seagulls.

It was a very destructive form of fishing, impacting a wide variety of fish, shellfish, and a large area of fish habitat. Every year, worldwide, bottom trawling impacts a far greater area of marine habitat than clear-cut logging does terrestrial forest habitats. And all of this damage is invisible to the human eye, out of sight and out of mind. The Bering Sea and the Aleutian Islands that border it to the south appear to be a virtual wilderness paradise, essentially uninhabited and incredibly picturesque, with snowclad volcanoes jutting out of steely gray waters. Yet this wild and scenic region has been despoiled by human exploitation on an industrial scale, nonetheless.

Those who like to believe that the world's vast and mysterious oceans, covering 71 percent of the planet's surface, and even today concealing many secrets and treasures, are a watery wilderness beyond man's reach and ability to harm, are sadly mistaken. Graced for eons only with the songs and sounds of the great whales and

dolphins, just since World War II, the oceans far and wide have filled up with noise from the engines and propellers of some 60,000 commercial vessels — massive container ships, oil and LNG tankers, cargo vessels, cruise ships — that ply its surface at any given moment.

Christopher W. Clark, Ph.D., a bioacoustics scientist at the Cornell Lab of Ornithology, has built one of the world's largest collections of animal sound recordings, including whales. Clark says, "The problem is, in the ocean, we are injecting enormous amounts of noise, so much so that we are basically acoustically bleaching the ocean. All the singing voices of the planet are lost in that cloud of noise." The ambient noise level in the ocean from shipping alone has doubled every decade since World War II. The award-winning 2016 documentary *Sonic Sea* argues that this accumulation of noise is altering the entire marine ecosystem, with the "sonic invasion" affecting some of the largest animals ever to live on Earth: the great baleen whales like the blue and fin.

Extremely loud underwater explosions from seismic surveys for offshore oil and gas exploration and active sonar used by the world's warships can seriously injure, harass, and even kill cetaceans, which are very sensitive to sound and in fact use it to forage, navigate, communicate, and mate. Whales can hear thunderstorms a thousand miles away.

At the same time, the sea is warming and becoming more acidic, great "garbage patches" of plastics and other non-biodegradable trash now tarnish the Atlantic and Pacific, toxics and contaminants are spreading, as



**WILDERNESS OF ANOTHER SORT** — Whitecaps in the Bering Sea (foreground) and the rugged Aleutian Islands (background). Although wild, remote, scenic, and unpopulated, the Bering Sea between Alaska and Siberia is not a pristine marine wilderness. It has been heavily impacted by decades of commercial fishing on an industrial scale, mostly bottom trawling for groundfish such as Pacific cod and walleye pollock, which has damaged benthic (bottom) habitat, and adversely affected populations of many finfish and shellfish species, marine mammals, and sea birds. Mature evergreen (coniferous) forests (above right) possess an enchanting, timeless quality. It is no surprise that J.R.R. Tolkien, author of *The Hobbit* and *The Lord of the Rings*, was a tree lover and a tree hugger, writing evocatively both about individual trees and deep, ancient forests (Mirkwood, Fangorn, The Old Forest, Lothlorien) in his beloved epic fantasies.



are “red tides,” “dead zones,” and invasive species. Legendary sea birds that float and soar on the trade winds far at sea, like the wandering albatross, with the largest wingspan of any bird now existing on Earth (11 feet) are now suffering population declines from longline fishing hooks, pollution, and plastics. Tropical coral reefs are bleaching and dying globally because of excessive water temperatures. In sum, our oceans have never been more threatened on multiple fronts, all induced by humans and our machines.

In naturalist Lois Crisler’s classic 1956 memoir *Arctic Wild*, she quipped, “landscape without wildlife is merely scenery.” Likewise, wilderness without wildlife is merely empty space, a lonely void. As stated above, ever since our primitive hunting and gathering ancestors embarked on their long march out of the savannahs of East Africa to conquer the world’s far flung ecosystems and biomes, their efforts to survive, reproduce, flourish, and “replenish the Earth” have had a dreadful and profound impact on the biosphere’s biodiversity and wilderness. Ancient humans, even at minuscule levels of population, affluence, and technology (the “force multipliers” of environmental impact in the famous I=PAT equation of Paul Ehrlich and John Holdren), are implicated in the extinction of perhaps hundreds of species of megafauna, which can never be brought back to life from the abyss of nothingness. Yet while the wilderness was gutted millennia ago — albeit inadvertently, not deliberately — all is not lost. This dawns on me anew every time I marvel at colorful photos of the world’s extant wildlife diversity. There is still much to appreciate and safeguard.

With the Agricultural Revolution 8,000 years ago and the Industrial Revolution in just the last two centuries, human populations, resource consumption, and waste generation all exploded exponentially. And the reverberations from this explosion are being felt in the world’s surviving and shrinking wilderness areas from the Arctic to the Antarctic, from the Eastern Hemisphere to the Western Hemisphere.

Is there any hope for wilderness? I would answer with a cautious “maybe,” but preserving genuine and not just “designated” or faux or boutique wilderness in the Anthropocene is a tall order, given the context of anthropogenic stresses that continue to multiply, accelerate, amplify, and intensify. It will take more than just officially protecting species and setting aside landscapes, as the extinction of the golden toad illustrates. Wilderness preservation can only succeed in the long run within a larger, widely shared commitment to environmental sustainability, rather than growth at all costs. To date, that quest has proved elusive, if not a pipedream.

Yet, despite my inveterate pessimism, I continue to be buoyed by evidence of growing support for the cause of wilderness and wild things, even in the unlikely of

places. In 2015, the late conservative syndicated columnist and pundit Charles Krauthammer, never one to avoid the opportunity to skewer environmentalist orthodoxy, nonetheless wrote that he thought our cruel treatment of animals, including caging and eating them, was the one behavior of contemporary society that future generations of Americans would find most “abominable” of all.

When I was a Peace Corps volunteer promoting conservation, wildlife refuges, wilderness, and national parks in Honduras in the late eighties, I had an uncomfortable first encounter with one particular Honduran professional community and economic planner. At first he bristled at what he believed was my arrogant “environmental imperialism” — having the gall as an invited guest in his country to impose my foreign Yankee concept of wilderness on his small, impoverished Central American nation. Hondurans, he insisted, did not have the luxury to lock away productive land for the benefit of mere animals and scenic beauty that only a few elites could appreciate, when teeming millions of common folk struggled to put food on the table and have a roof overhead.



**Pico Bonito in the rugged Cordillera Nombre de Dios mountain range soars 8,000 feet above the Caribbean Sea and the Rio Congrejal in northern Honduras. While a Peace Corps volunteer, the author assisted Hondurans in preserving, studying, exploring, and building public support for this wilderness area, a newly created national park.**

Hondurans rejected the wilderness concept out of hand, he maintained, because they knew God put land and natural resources on Earth specifically for mankind to use productively, not to stare at while starving. Yet within six months this skeptic became one of my most important and supportive allies in the effort to establish and delineate the boundaries of a new Honduran national park, *Parque Nacional Pico Bonito*, which preserved wilderness rainforest and cloud forest habitat in the rugged *Cordillera Nombre de Dios* mountain range along the Caribbean Coast. This protected wilderness also

sheltered jaguars, ocelots, howler monkeys, quetzals, toucans, scarlet macaws, and harpy eagles, among other rare and endangered wildlife in Honduras. Helping him realize that the watersheds of this national park would be a perpetual “factory” producing clean, potable water for dozens of surrounding communities that could ill afford to treat and purify water, in a country where polluted drinking water was a serious public health menace, proved valuable in his conversion to the conservation cause.

On a much larger scale, beginning in the early 1990s, the late American conservationist and businessman Doug Tompkins and his wife Kris invested tens of millions of dollars of their own savings to purchase and preserve more than two million acres of rugged wilderness in Patagonia and Tierra del Fuego in southern Chile and later Argentina. Some lands are managed as private parks and others donated back to the governments of these countries as national parks. At first these massive land purchases by a foreigner provoked a certain understandable suspicion and resentment in Chile, but eventually most Chileans and their government came to respect the Tompkins’ visionary efforts on behalf of their *patri-monio natural* (natural heritage).

Tompkins Conservation notes that its “goal is to recover healthy populations of all native species.... Today’s conservation science reveals that in some cases simply preserving land will not ensure an ecosystem’s health. Often, we must take active steps to recover — and even reintroduce — keystone species to reassemble the food web and sustain biodiversity.” And so they have projects to restore and reintroduce giant anteaters, jaguars, tapirs, peccaries, macaws, and jaguars to various protected ecosystems where they belong and once lived.

Here in North America, Rewilding Earth, founded as the Rewilding Institute in 2002 by veteran wilderness advocate and author Dave Foreman, has a mission to:

...develop and promote the ideas and strategies to advance continental-scale conservation in North America and beyond, particularly the need for large carnivores and a permeable landscape for their movement, and to offer a bold, scientifically-credible, practically achievable, and hopeful vision for the future of wild Nature and human civilization.

Executive Director John Davis says that: “Rewilding, in essence, is giving the land back to wildlife and wildlife back to the land.” The concept of rewilding was developed by conservation biologist Michael Soulé in the mid-1990s. As Soulé and fellow conservation biologist Reed Noss wrote in “Rewilding and Biodiversity,” their seminal 1998 article in the journal *Wild Earth*,

rewilding is “the scientific argument for restoring big wilderness based on the regulatory roles of large predators.” A real-world case study of rewilding took place with the reintroduction of timber wolves into Yellowstone National Park in 1995 after an absence of 70 years. It has had widespread, cascading, positive effects on the Yellowstone ecosystem.

Despite noteworthy efforts to resuscitate extinct animals like the passenger pigeon and the woolly mammoth by using cloning and other cutting-edge genetic techniques, as a rule extinction is forever, and will remain so for the vast majority of even recently extinct species, including those we and our ancestors pushed over the edge of the abyss. Wilderness, however, differs from individual species. Some real semblance of wilderness, if not all the creatures and interactions between them that once inhabited it eons ago, can be restored with enlightened, active management as well as just giving nature itself a chance to recover (passive management).

I am rather gloomier about long-term prospects for preservation and restoration of the ocean wilderness. While active and encouraging efforts are under way to reduce exposure of whales and dolphins to harmful noise levels from active sonar, echosounders, air guns, seismic surveys, and shipping, it remains to be seen how successful these will be in the face of exponentially expanding human exploitation of the oceans for energy (offshore wind power as well as outer continental shelf oil and gas exploration and production), waste disposal, commercial shipping, war games, and geopolitical maneuvering.

Then there are ominous temperature increases and ocean acidification from rising carbon dioxide concentrations in the atmosphere. A large portion of that additional CO<sub>2</sub> dissolves in ocean surface waters to form carbonic acid, which in turn interferes with calcification, the process by which some sea creatures and corals make their shells from dissolved calcium carbonate (CaCO<sub>3</sub>). The oceans are already 30 percent more acidic than just a century ago. That is an incredible rate of change. Then there are overfishing, pirate whaling, pollution, and plastics. The long-term outlook for the sea and sea life remains dire.

I used to ponder the meaning of Thoreau’s famous saying, “In Wildness is the Preservation of the World.” I certainly appreciated wildness like Thoreau did, but I wasn’t quite sure I understood all that he was driving at. I’m still not sure of that, but now I see that unless industrialized civilization learns how to exercise the wisdom and self-restraint needed to preserve large areas as wilderness, not only the wilderness will perish, but our civilization as well. Civilizations cannot be built — or long endure — on wastelands. ■