

## Chapter 1—Extinctions, Past and Present

OUR PLANET IS LOSING ITS LIFE. The Earth's climate is now deteriorating rapidly, and disaster—even human extinction—is now coming into view in the not very distant future. The cause is one more air-pollution problem we created to now threaten even the planet's most invasive species, us. The geochemical dynamic for extinction is explained in the science book *Under a Green Sky*, by Peter D. Ward (Harper Collins, 2008). The book's subtitle reads: "Climate change, the mass extinctions of the past, and what they tell us about our future." Professor Ward describes how, in four of Earth's extinctions during the last half-billion years, carbon dioxide in the air exceeding the level of 1,000 parts per million (ppm) caused the oceans to become poisoned with deadly hydrogen sulfide. He tells us that this chemical, being emitted from the sea as gas, turned the sky permanently green and killed most life on land.<sup>1</sup>

Paleontologists and geologists confirm that since life on Earth began about 500 million years ago there have been five mass extinctions.<sup>2</sup> They tell us that there are accurate and close correlations to be made between global average temperature, sea-level rise, atmospheric CO<sub>2</sub>, and mass extinctions. Man-made air pollution is the cause of climate change leading to the mass extinction that may end the gradual sixth extinction now happening and accelerating. If we continue with business as usual burning fossil fuels, leaking methane and refrigerants, and in other ways also thoughtlessly damaging the climate, possibly in about 200 to 250 years we will have so poisoned the sea and the air that it does seem that humanity will join in the sixth extinction.

To set the stage for this book about fighting climate pollution, this first chapter is much about the life our planet has already lost and is losing now at the hand of man, that part of the sixth extinction caused by bullets, poisons, traps, and our other physical tools of kinetic death. Any day now, the gillnets of Mexican fishermen could drown the last of the vaquitas, doll-faced porpoises only about five feet long. If they are not yet extinct, now perhaps only about ten remain alive. The smallest of all cetaceans, an adorable elf of a whale, today the vaquita is about to become a myth and a memory.

Preventing such tragedies is the job of wildlife officers, who like pollution-control officers share the large field of natural-resource and environmental protection. But it is pollution fighters, both volunteers and employed, and not wildlife officers, who can prevent the completion of the sixth extinction by controlling and ending climate-killing air pollution. Accompanying them will be many other professions, especially engineers of all types needed to build the new, clean-energy sources and to relocate so many cities to higher ground inland.

I did not know about climate change before I was well into my career at the U.S. Environmental Protection Agency. I never imagined that I would become, even briefly, the nation's top lawyer directly responsible for all EPA federal investigations of pollution crime. But the foundations for my life as a pollution fighter began 50 years earlier in the 1940s, when I was a child living on the coast of Maine.

At the sounding of the horn, some women—permanent residents of our little town—grabbed their sharpest knives and rushed out their front doors. In the street they were joined by hungry cats, and excited children like me, eight years old and attracted to commotion. We all rushed down the road to the harbor to see coming in from the sea the sardine transport boat arriving at what we called “the fish factory.” Being halfway “down east” in Brooklin, Hancock County, Maine, these town women anticipated a rare payday. The year was 1949.

After being lifted out of the hold of the transport boat, the little fish would travel down a long, watery sluice roofed over to keep out the gulls. Their cries were loudly calling their companions, arriving now in numbers enough to have eaten the entire catch, but only the boldest came in under the roof. Standing along the sluice, the aproned women sliced, sorted, packed, and threw enough scraps about so the town cats never left hungry. The smells, sights, and sounds—squawking gulls, meowing cats, heavy motors running, the women talking and their knives flashing as they worked, water rushing down the sluice—were irresistible to me and the other town children there too. Then the sardine carrier’s hold was emptied, all was packed, and “the fish factory” became empty and silent.

The women returned to their homes. They put some cash in their dresser drawers and resumed preserving summer fruits and vegetables to keep in their cellars against the long, lean winter to come. In late August, the evenings became chilly and dark early, and in the night sky we might see glimmers of the *aurora borealis* that we called the “northern lights.” All too soon it would be September, and I would be taken 600 miles south to my parents’ home in Baltimore. There during another long school year in a big city, I would be wanting and waiting to return to my small town by the cold sea.

Finally, June would come again, and we summer people would reappear in town. Until July, most mornings our harbor would be unseen until the sun could burn off the fog. Another summer had come to the coast of Maine, and then would come another, but the big sardine boat never returned. Sometime in the 1950s, the fish factory was sold to become a boatyard for building and repairing the yachts and small pleasure boats of summer that were replacing year-round working boats. A way of life was shifting because of new realities. Fish-factory jobs were surely tough, low-paying, and intermittent, and in 2010 the last Maine sardine factory closed. Whether the year-round people of the town considered this change to be for the better or worse, I cannot say. To me the arrival of the sardine boat is a shimmering memory of big excitement during carefree and glorious summer days. But a way of life was ending, and in 1959 my childhood would end too.

Long since I was so lucky to have been a summer child living in my grandmother’s home on the Maine coast, I have wondered—did the sardines disappear from overfishing, did foreign countries catch and can them for less, or was it because the East Coast market taste shifted to lobster and tuna? Today, I contemplate the end of the fish factory as the irreplaceable loss of a working marvel for processing a gift of nature. Now we do know that around the world many fisheries have been exploited to the point of commercial extinction. Man-made plastics are being eaten by and killing marine animals, birds, and fish, and scientists say that in a few decades there will be a greater weight of plastics than fish in the sea. Maine lobsters, while still plentiful and very profitable with many customers now in China, are beginning to shift their range northward to Canadian waters because of the warming of Maine waters. This warming also is bringing in invasive green crabs and milky

ribbon worms to attack the soft-shell clams. These predators, along with toxic red tides until now rarely occurring in New England waters, are reducing clam harvests needed for fried clams, chowder, buckets of “steamers,” and clambakes on the shore. As the climate changes, it is possible in future decades that the lobsters and clams may disappear like the sardines. In 50 years, for today’s children now on the Maine coast, digging at low tide for clams, seeing lobster boats passing by—these too may become just shimmering memories of a colorful way of life gone by.

I did not know it at the time, but about 100 miles south of my grandmother’s house on the Maine coast, from the early 1950s, lived Rachel Carson. Here she was quietly writing her book *Silent Spring*, published in 1962, which opened many eyes and caused her to be seen by many as the mother of modern environmentalism or ecology. While she was an oceanographic scientist who understood what she was seeing, and I was an unknowing child, it happened that separately yet in the same years we each liked wading into tidepools to lift the seaweed to reveal little hidden creatures and smell the salty brine. We each liked peering down from a rowboat to see the life on the bottom of a harbor, and picking up starfish and sea urchins at low tide. We each liked walking among the whispering spruce and fir trees of a little island, hearing the waves splatter on the rocks of its windward shore.<sup>3</sup> While she was coming to the end of her life’s work, as a child and then a teenager, I too was absorbing the magic of the Maine coast, forming lifelong interests and values that would lead to my own life’s work. Always remembering the legacy of Rachel Carson, and in the hope that others will do the same, this book is in part the story of how a person may well follow along her path in life.

Rachel Carson wrote about science clearly and simply, and often almost poetically. Here are some of her words:

It is a wholesome and necessary thing for us to turn again to the earth and in the contemplation of her beauties to know the sense of wonder and humility.

Those who dwell among the beauties and mysteries of the earth are never alone or weary of life.

In every out-thrust headland, in every curving beach, in every grain of sand there is the story of the earth.

Rachel Carson understood and loved the sea, which covers 70 percent of the surface of the Earth. I also love the sea, yet my book due to length limitations does not give the sea the full exploration it deserves. The decline of the health of the sea is caused by human attitudes and behavior mostly occurring on the land, so I have made the 30 percent that is land the locus of this book, knowing that all things eventually flow into the sea. Fortunately, steering in Rachel Carson’s wake is Peter Neill, a thinker who writes with passion and eloquence about saving the world’s oceans and water sources:

...I hear it again and again...presentation of the overwhelming problem[s of the sea] followed by silence, not solutions. It is as if we are sailing along the edge of an abyss; we have the skill perhaps to keep going, to extend our way for a time, until we fall off into darkness, or we can apply that skill to our ship and change course, away in a new direction. It is dangerous and uncertain, but I submit that we have no choice but to set forth.<sup>4</sup>

As you will read in a following chapter, with her life and message Rachel Carson inspired good people and good laws that certainly have saved some endangered species. But since she died in 1964, too little has been done to limit wildlife depletions and extinctions that humans are causing on sea and land all around the world. A North Atlantic species, one of the largest whales in the sea, the so-called “right whale,” today is threatened by ship strikes and fishing nets off Maine and the Canadian Maritime Provinces. The National Oceanic and Atmospheric Administration describes this whale as almost extinct. It may soon join its cousin the tiny vaquita, all extinguished at the hand of man. For so many more species, mass extinction is now in sight because of the climate chaos coming. It is not too soon for the U.S. Department of the Interior also to place humanity officially on its endangered species list.

As we begin to address the fate of all life on our planet, let us consider these questions posed to us by Rachel Carson:

... to open your eyes... ask yourself—What if I had never seen this before?

What if I knew I would never see it again?



Before we consider, in another chapter to follow, how human carelessness with air pollution now threatens humanity, we will first look into extinctions facing wildlife. Humanity has been causing Earth’s sixth extinction, with species exterminations accelerated since perhaps 11,000 years ago at the ending of the last ice age. To begin tracing the history of the sixth extinction, let us visit the North Sea, where fishermen today in their nets may pull in not just sardines, but femurs four feet long and other gigantic bones raised from the seafloor. Woolly mammoths and mastodons were hunted and eaten by our prehistoric ancestors, but here they did not eat them all. During the last ice age, when sea levels were much lower, today’s seafloor between England, the Netherlands, and Norway was dry; this area was called “Doggerland.” Whether drowned slowly by the sea rising as the planet warmed, or by a seismic sea wave when Norwegian submarine mountains collapsed, some mastodons or woolly mammoths drowned naturally. Doggerland became the Dogger Bank, today a good place for commercial fishing in water about 65 feet deep. But human appetites are not to be underestimated.

Like the town cats scurrying to the arrival of the sardine boat in Maine, early Europeans too were usually cold and always hungry. They dined on a giant ox—the auroch—famously painted in the caves of Lascaux in France (some aurochs survived until the 17<sup>th</sup> century). Of course, those cave men were just early and unwitting followers of today’s stylish “paleo” or “Atkins” diet! In North America, humans arriving from Asia ate all the camels, zebras, and horses. Yes, there were indigenous horses long before the arrival of Spanish *conquistadors* whose mounts escaped and repopulated the American West. Once extinct on continents, some species survived on islands. But, with the invention of high-seas vessels, then came sailors. Seventeenth-century Dutchmen landing on the island of Mauritius found the dodo bird, a 50-pound flightless pigeon, so curious it walked up to greet the sailors coming ashore with firearms and appetites. Roasted dodo birds tasted so delicious after too many fish dinners on sailing ships. So the sailors ate them all. In the last 400 years, more than 500—

some say 800—extinctions of animals, and more than 600 extinctions of plants, have been documented, and the pace of extinctions is accelerating.

European settlers arriving in North America shot all the Carolina parakeets and all the passenger pigeons. It is an amazing feat that relatively few hunters could kill about four billion passenger pigeons. They shot them because they were pests to farmers' crops and as cheap food for themselves and their slaves. Like the cavemen in who sketched the tasty auroch, we can thank John James Audubon who in the 19<sup>th</sup> century arrived in the U.S. just in time to paint some of the last of these birds that we will never see alive.

In the American "Wild West," adventuring hunters and settlers almost exterminated the American bison...we call it the "buffalo." Nineteenth-century European-Americans shot them for their skins and even for sport, sometimes from windows of the first steam trains, often leaving their bodies to rot on the ground. This was government policy as part of the ethnic cleansing to starve and remove the Native Americans living on the Great Plains east of the Rocky Mountains. To quote U.S. Army General Philip Sheridan: "Let them [white adventurers and settlers] kill, skin, and sell until the last buffalo is exterminated...to bring lasting peace and allow civilization to advance." White men killed perhaps as many as 50 million buffalos, leaving only about 2,000 surviving.

During the 19<sup>th</sup> century in the far northwest in today's State of Washington, Chief Seattle led the Duwamish and Suquamish tribes. He worried about the invasive white men taking the salmon, trees, and lands of his native people, reportedly saying:

What is man without the beasts? If all the beasts were gone, men would die from a great loneliness of spirit. For whatever happens to the beasts, soon happens to man. All things are connected.... Whatever befalls the earth, befalls the sons of the earth. My people resemble the scattering of trees—fallen—on a storm-swept plain.<sup>5</sup>

We are fortunate today to have the example of a very energetic young gentleman from New York, who while adventuring in the 1880s in the Wild West, had observed the disappearance of buffalos, other wild game, and even their habitats to the overgrazing of cattle. He then became alarmed by the disappearance in Florida of plumed wading birds, harvested for their feathers that sold by weight exceeding the price of gold in New York City, London, and Paris. "TR" or "Teddy" Roosevelt in his day became world famous for many reasons, including his well-publicized refusal to shoot a lame old bear held captive on a rope. This image took shape as a stuffed toy, the "Teddy Bear," that became the enduring symbol of a child's natural love for animals. Theodore Roosevelt would be the first to put high on the national agenda the conservation of natural resources.

In 1900, Roosevelt helped Congressman John Lacey pass the first federal law to protect birds and game animals shipped in interstate commerce. Officers began seizing bird feathers and skins, and the "Lacey Bird and Game Act of 1900" saved many wildlife species (of both plants and animals) from extinction by outlawing their harvesting, hunting, and interstate shipping to market. But illegal taking ("poaching") and transporting across state lines continued, so beginning in 1901 Roosevelt, by then the President, protected about 230 million acres as national wildlife refuges, national forests, and national monuments, including lands that became many of the first national parks. Only on federally protected lands could the birds and animals live entirely safe from hunters.



[Rest of the chapter omitted from this sample.]