Chapter 7 - Death to Others

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What Are We Doing? The Many Ways We Kill, The Great Occupation, Death by Poisoning, Water For Us Not Others, Shoot 'Em Up! Cook 'Em, Shake 'Em Up, References

What Are We Doing?

Have you heard? Humans are causing the 6th mass extinction. Specifically, we are causing species to disappear at 100 to 1000 times the rate that they would be without human impact. Who says? Well, researchers.[1,2,3] Who are they? Actually, thousands of dedicated humans who actually care about life other than humans, the "other life forms" on our planet. These are people who study wildlife and document how they live, where they live, and the numbers of various species of wildlife in different regions around the globe.

Some of these researchers are professors at universities, where they teach about wildlife and lead research efforts. Others are college educated with science and engineering degrees that allow them to understand and interpret information about wildlife, and communicate that information to other researchers, students, the government and the public. Other researchers may not be formally educated, but contribute greatly to the efforts of understanding wildlife trends by performing needed tasks such as field observations and surveys, typically near where they live, often on a volunteer basis. Examples would be the thousands of citizen scientists throughout the world.

> "Humanity has delivered a blow to the planet not even remotely approached by that of any other single species." Human activity has raised the species extinction rate a thousand times over its prehuman level, and threatens to extinguish or bring to the brink of extinction half of the species still surviving into this century. EO Wilson[4]

Mass Extinctions on Earth[5]

1st - Ordovician-Silurian Extinction – 444 mya (million years ago) - Intense glacial and interglacial periods caused large sea-level swings and moved shorelines dramatically. Tectonic uplift of the Appalachian mountains created lots of weathering, sequestration of CO_2, and changes in climate and ocean chemistry.

2nd – Devonian Extinction – 360 mya - Rapid growth and diversification of land plants generated rapid and severe global cooling.

3rd - Permian-Triassic extinction – 250 mya - Intense volcanic activity in Siberia. This caused global warming. Elevated CO_2 and sulfur (H_2S) levels from volcanoes caused ocean acidification, acid rain, and other changes in ocean and land chemistry.

4th - Triassic-Jurassic – 200 mya - Underwater volcanic activity in the Central Atlantic Magmatic Province (CAMP) caused global warming and a dramatic change in the chemical composition of the oceans.

5th - Cretaceous-Paleogene extinction – 60 mya - An asteroid crashing into Earth took out all non-avian dinosaurs.

6th - Quaternary Megafauna Extinction - 50,000 and 3,000 years ago, the beginning of man's decimation of wildlife, claimed around half of the large (>40 kg) land mammal species. Continues to today.

My point is, there are a lot of dedicated individuals who are collaborating in the effort to understand the populations of wildlife on our planet, and their efforts are real and they are honest. This is not a bullshit conspiracy theory that seems to capture the attention of the smaller minds among us these days. It's real. We humans are decimating wildlife on our planet. And, it matters. It matters big time. It matters because we humans have evolved alongside said wildlife for millions of years, and if we trash the wildlife through our own stupidity, we'll go down with them. We can't expect to exterminate 99.99% of all species, and be just fine on our own without them. We need the wildlife more than they need us. So, we might want to pay attention to what's going on here, and knock it off. Think about that.

According to the World Wildlife Fund, we've managed to cause a 68% drop in the abundance of 20,811 monitored populations of 4,392 vertebrate species, which includes mammals, birds, amphibians, reptiles and fish) between 1970 and 2016.[6,7] Think about this. That means we've taken down well over half the wildlife on our planet in less than 50 years. Ironically, the first Earth Day was in 1970. It seems like Earth Day hasn't turned out to help the wildlife all that much, has it? According to the 2020 Living Planet Report, we are threatening wildlife populations by "overusing the Earth's biocapacity by at least 56%".

When we think about how much wildlife we've lost on Earth, a good starting point is to understand how much life is on Earth right now. Then the losses in the past and continued losses in the future are a lot easier to get a handle on. Luckily, an awesome study from the Weismann Institute, the first comprehensive study of global biomass, has calculated the breakdown of all biomass on Earth, a total of 550 gigatonnes of carbon (GtC), among the entire kingdom of life, including all plants and animals.[9] This is obviously the result of a lot of scientists and a lot of work. By the way, a gigatonne is a billion metric tons.

Will rapid population growth trigger a total collapse?

It already has. Ask the 15,634 scientists who have warned that "we have unleashed a mass extinction event, the sixth in roughly 540 million years, during which many current life forms could be annihilated or at least committed to extinction, by the end of the century."[8]

Since life exists in so many forms and sizes, from tiny single-celled organisms to giant redwoods, it can be a bit mind-boggling to compare all these forms in a meaningful way. As an engineer, I tend to prefer weight comparisons, because they are very straight forward and you can't argue with weight. I mean, if you're fat, you're fat. A pound is a pound. So, when we talk about wildlife, weight is probably the most accurate way to compare in terms of total losses of wildlife, kind of like the way I use CO_2 emissions to compare global warming impacts of our activities throughout the book. Which is, by the way, using weight of CO_2 emissions. It's a way of normalizing loss of wildlife, like comparing apples to apples, only more like elephants to elephants, since we're talking about animals as opposed to plants.

The panel shows the state of global biomass as of 2018. Think of it as a snapshot in time, since these numbers are constantly changing. Obviously, human population has increased a lot since 2018, and wild mammals continue to decrease. These numbers show what biomass we have left since the beginning of the Quaternary Megafauna Extinction, which started 50,000 years ago, and lasted until about 3,000 years ago, the ancient time period when humans really got a foot hold on the planet and started making a serious impact on the other life forms. Technically, this is the 6th mass extinction, and it continues today.

As of 2018, we'd already taken out well over half of the large mammals (think mammoths and elephants) and nearly 90% of marine biomass, from whales to krill. At the same time, we've increased our own species by 800 times, and increased livestock so much that our livestock now sits at more than 14 times the amount of wild mammals. Considering that we only make up 0.01% of the life on the planet, we sure have managed to create quite the global shit show, if you ask me. So, you can see that as we've increased our livestock, we've displaced wildlife in the process. We've also taken out about half the original native plants, and replaced them with our crops, buildings, roads, and pastures for grazing livestock.

How Much Life is on Earth?

Total Life: 550 gigatons

Plants – 450 GtC

- Microbes – 93 GtC
- Animals – 2 GtC
  - Arthropods – 1.2 GtC
  - Fish – 0.7 GtC
  - Annelids – 0.2 GtC
  - Mollusks – 0.2 GtC
  - Livestock – 0.1 GtC
  - Cnidarians – 0.1 GtC
  - Humans – 0.06 GtC
  - Nematodes – 0.02 GtC
  - Wild Mammals – 0.007 GtC
  - Marine Mammals – 0.004 GtC
  - Wild Birds – 0.002 GtC
- Viruses – 0.2 GtC

Weizmann Institute of Technology, 2018 [10,11]

It's easy to forget about microbes, because they're so tiny we can't even *see* them without a microscope. However, blowing them off completely may not be the greatest idea, because microbial biomass outnumbers the life that we *can* see by a long shot, which is telling and troubling. This is because we know the least about the microbes, and how they impact entire ecosystems. We don't even fully understand the biomass that makes up a huge portion of our own bodies. Hell, scientists didn't even realize how much of our bodies is actually made up of microbes, or separate single-celled organisms, until the past few decades. My point is, we don't know as much as we might think, and to mess with the ecosystems of the entire planet by blithely eliminating all the wildlife is just asking for it. Dontcha think? When we have no idea how to even cure cancer, the most researched killer of humans on the planet? Think about that. Does that bother you? It definitely makes me nervous. Just saying.

Of the animals, the arthropods, which includes insects (you know, bugs), arachnids (spiders and such) and crustaceans (crabs, lobsters and the like), basically anything with an exoskeleton, makes up more than half the animal biomass, which means they play a fairly significant role in the intricate web of life that we barely understand. This is pretty scary, because insects are known to be among the hardest hit of our anthropogenic global wildlife destruction in the sixth mass extinction.

Another thing I notice from these numbers is that livestock is literally more than humans, specifically, 1.7 times as much livestock biomass as humans. Which means we sure do eat a lotta meat, if you ask me. Which is sad, since meat has a much higher carbon footprint to produce than vegetables, by far, and we consume far more beef than we need. Also, excess meat is bad for our health, leading to even more carbon footprint per capita as we try to save our sorry sick gluttonous meat-eating butts with last minute medical care from eating so much freaking meat. For my part, I'm embarrassed. Are you?

At the end of the day, although humans make up only 0.01% of the total global biomass, we have contributed to an 83% decline in wild mammal biomass since pre-human times and a 50% decline in plant matter. Obviously, we're very efficient when it comes to exploiting species and trashing our environment. We've managed to decimate wildlife for food or pleasure on virtually all the continents. Look at us! Go humans go!

In the past century, mass extinctions are accelerating, because human population growth is accelerating. The Proceedings of the National Academy of Sciences warn that Earth's mass extinction crisis is worsening. Scientists have identified 543 terrestrial vertebrate species that have gone extinct since 1900, and another 515 that are "on the brink" of extinction.[12] Under the "background extinction rate" covering the past 2 million years, it would have taken 11,700 years for 1,058 terrestrial vertebrate species to go extinct. The growing human population, increasing rates of consumption, and projected growth in the future can only accelerate the rapid disappearance of species, a problem for survival that only human beings have the power to alleviate. Basically, we're the ones that jacked it up, and we're the only ones who can fix it. Kind of like a science fiction movie. So, how's it gonna go? Are we gonna fix this or not? Is the human race gonna rescue the planet at the 11th hour or are we all gonna die? Except for the ultra-wealthy morons that get conned out of millions to jump on the shuttle to planet X, where life is good and they'll be saved? You gotta wonder….

Last year, ecological scientists said one million species were on the brink of extinction.[13] In addition to the biomass and natural ecosystem losses, insect populations have crashed, according to the report from the UN's Intergovernmental Science – Policy platform on Biodiversity and Ecosystems Services. By the way, pollinators such as bees and butterflies are insects, so if we lose those we also lose a lot of plant life that depends on pollination. Entire ecosystems around the world, from the Amazon to the Antarctic, are on the verge of collapse because of pollution, water scarcity and the impacts of global warming. Because of us.

The Many Ways We Kill.

The next question to consider is, how exactly are we killing wildlife? How can us humans be responsible for so much death, destruction and extinction of the other life that we share the planet with? Personally, I don't hunt or fish, and what little meat I eat is farmed, so it's not technically wildlife. I refuse to be a part of poisoning the space around me, either inside or outside of my home, saying no to any kind of pesticides or toxic cleaning products, I consume mainly organic food and I prefer to take insects and spiders outside rather than simply squash them. Unless it's the middle of winter. Then I put them in an indoor planter and hope for the best. That feels a little better than putting them out where they're just going to freeze to death. I let spiders live in the potted plants in winter, because they naturally prey on tiny insects that prey on the plants, so they're really helpful. Once in a while I'll swat a fly in the house, or smack down a fruit fly, but they don't weigh very much. So, how can I be responsible for all this loss with my mere existence?

Sadly, it turns out that I am personally just as responsible as anybody else for wildlife destruction and, yes, it's with my mere existence. Just by being born, I'm contributing to the loss of wildlife. The second my tiny little head popped forth from my mother's womb, I began taking up space and consuming resources just like any human inevitably does. I may not be the worst, since I at least make

an effort to minimize my carbon emissions that contribute to global warming, but I'm definitely complicit, whether I like it or not.

Table 1 - Human impacts that are causing major reductions in wildlife

Impact	Notes
Occupy Land	Construction, buildings, factories, parking lots, all of our structures as well as surrounding yards and parks take space from wildlife.
Agriculture	Farmland and ranchland to grow our food.
Extract Resources	Mining, petroleum extraction, logging for materials to build takes yet more land from wildlife.
Roads	Roads and train tracks not only take more land from wildlife, they directly kill wildlife when they are run over by traffic and trains.
Toxins	Pesticides applied to crops kill insects directly without discrimination, and poison the land, making it toxic for all life that contacts it, including wildlife higher up the food chain such as birds, mammals and amphibians that consume poisoned plants and insects.
Wetlands Destruction	This not only destroys habitat for local wildlife that depends on the habitat, it is devastating for migrating birds who depend on these same wetlands.
Kill Them	Hunting, poaching or poisoning, for food, entertainment or because they annoy or inconvenience us in some way. Also, lead bullets poison carcasses left by hunters, which in turn poison wildlife that eats the carcasses.
Global Warming	Increasing temperatures, rising sea levels, wildfires
Noise	Noise interferes with wildlifes' ability to hear subtle sounds of predators or prey.
Light	Light confuses wildlife and interferes with circadian rhythms and natural processes.
Pets	Capture of wildlife for pets.
Invasive Species	Introduction of non-native species into an established ecosystem by accident or on purpose out-competes or kills off native species, reducing overall diversity.
Disease	Transmitted from domestic animals to wildlife

The Great Occupation

We are constantly taking land from wildlife as we continue to construct more homes and buildings to accommodate a growing population, and take ever more farm and ranch land to grow more food. Once we occupy it, it becomes difficult, if not impossible, for even the smallest insect to live there. Let's face it, what animal can survive being run over by mechanical farming equipment, or the lawnmowers, hedge trimmers and leaf blowers that take out insects, small animals, birds and nests in shrubs and yards?

The West's landscapes have been completely screwed up and overrun by cattle, that have displaced wildlife in the process. Meat may be unhealthy, but it's popular, and its popularity sometimes makes me wonder if we'll ever muster enough passion to save our wildlife when we don't even care about ourselves. I guess at one time it seemed like a good idea to graze cows on public lands, quite natural and all, but back then there were far fewer people demanding far less beef, so it probably wasn't a big deal. But now that we're overrun with too many people demanding too much beef, the cattle is unfairly displacing wildlife, throwing ecosystems out of balance, overgrazing, trashing the banks of rivers and streams, and completely ruining the water quality with disgusting cow manure, so it's undrinkable by wildlife or humans, unlivable for fish, and causes nasty algae blooms. If you don't believe how gross this really is, do what I did, and walk section 18 of the Colorado Trail, through the La Garita Wilderness.

There are cows everywhere and the water is so filthy you can't even think about drinking it. There was no way we'd touch it with our water filters, because the water would have plugged the filters and ruined them in no time. So, how many fish do you think live in that water? How do you think the elk and deer and fox and birds like it? We incorrectly thought that because the trail went through designated wilderness it would be free of cows, but we'd be wrong. Evidently here in the U.S. it's okay to graze cows in wilderness for cheap. We had to move piles of cow dung to make a place to camp. So much for solitude in the high country.

And the ranchers who graze the cattle are getting a great deal, at $1.35/head per month, a much better deal than if they were grazing cattle on land that they actually owned. Or, if you're Cliven Bundy, you don't pay at all, and gather all your self-entitled gun-toting friends to threaten law enforcement with firearms if they try to collect. Basically, we're paying the difference in taxpayer dollars, because we're letting ranchers graze cows for a song on our land, while ruining the water, displacing our wildlife and driving it to extinction, so they can make a pittance of a living. And, if that weren't bad enough, these freeloaders also tend to shoot any predators they come across to make sure they don't bother the cows that they displaced their original prey, the elk and buffalo, with. They've also killed off 98% of prairie dogs, because the cows might trip in the holes that the prairie dogs dig for their burrows. And we let them. Think about that. If you were lucky enough to own 100 acres of land with a stream running through it, would you let a rancher graze their cows there for cheap, eat the grass down to nothing, trash the water in your stream and kill any wildlife that dares to enter? Well, that's what we're doing. Think about that.

> The use of the term "right here in our backyard" is ironic when referring to wildlife roaming hoods and yards at night, getting caught on cameras, etc. "They will even use those words, our backyard, to describe the foothills or the front country, as if the animals had somehow stumbled into the exclusive domain of the human species. But the truth is quite the opposite: It is we who are the encroachers. Habitat loss due to development is a major cause of threatened and endangered species across the West. Even as new homes, subdivisions and strip malls push ever farther into the wildland-urban interface, enthusiasm for the wildlife "in our backyards" abounds online." Jennifer Sahn, Editor, High Country News

It turns out that climate change is not the main cause of the decline of grassland species. The primary cause is habitat loss, and the North American grasslands are one of the most at-risk habitats in the world. The American Bird Conservancy estimates that 51.3 million acres in the Northern Great Plains have been plowed under and replaced with cropland. In 2018 and 2019 alone, nearly 600,000 acres of Northern Great Plains grasslands – an area almost the size of Yosemite National Park – were converted to fields of wheat, corn and soy.[14] By the way, most of the corn is grown to feed cattle that we're overconsuming. By limiting or eliminating beef and dairy, we could return a huge portion of this cropland back to wildlife. This is an example of a personal choice that any of us individual consumers can make on behalf of wildlife.

The Berkely Pit in Butte, Montana, is a sad example of the on-going horrors inflicted on wildlife by mines. A superfund site and the biggest copper mine in the world, long since abandoned by Atlantic Richfield, it's now a mile-long toxic dump full of sulfuric acid that historically has killed thousands of migratory birds. Now engineers are working to keep birds from landing in the tempting but lethal water, with deterrents like rifles, drones and bullhorns.

> "If you take care of the birds, you take care of most of the big problems in the world." Thomas Lovejoy.
>
> Our changing of the climate is leading to dramatic losses of bird species globally. Birds are our last best connection to a natural world that is otherwise receding. National Geographic, June, 2018, "From the Editor, The Year of the Bird", Susan Goldberg

Industrial logging operations over the past several decades have taken out entire forest ecosystems, driving species to the brink of extinction in the process. Once-plentiful mountain caribou in Canadian old-growth forests are down to about 1,000 individuals. And, to make things worse, since we've trashed the caribou by taking their habitat away, we feel the need to save the remaining caribou by killing predators like wolves and competing species like moose, in order to maintain some level of artificial balance as we continue to trash their land to satisfy our constant demands for yet more wood for endless construction to house our endlessly growing population. As if we really think we'll save them by killing predators, when the real reason for their decline is that we trashed their land because we have too many people demanding too much wood. And, what's really disgusting is that a huge portion of this wood is for toilet paper. So, you don't have to build a new house to ruin the forests, you just have to wipe your butt with toilet paper.

General ecosystem declines and habitat loss are impacting thousands of species across the globe, like gray-headed flying fox, mandrill, southern pig-tailed macaque, European ground squirrel, and fossa. Globally, brown bears occupy only 2% of their former range.[15] In the Amazon, 136 acres of jungle are razed per hour for farming, mining and development.[16] Sounds like the jungle will be completely gone in the near future at that rate. So much for Harpy eagles and the thousands of other unique species that live there. Not.

More than 80% of the U.S. lies within a kilometer of a road, a distance at which cars project 20 decibels and trucks and motorcycles around 40, the equivalent of a humming fridge. Obviously, it's much louder within that distance. Basically, there's no getting away from the constant racket. As car traffic swelled in the 20th century, road noise became a public-health crisis, interrupting sleep, impairing cognition and trigging the release of stress hormones that lead to high blood pressure, diabetes, heart attacks and strokes. A 2019 report by one French advocacy group calculated that noise pollution shortens the average Parisian life span by 10 months. In the loudest neighborhoods, it truncates lives by more than three years.[17]

So if noise has all that impact on us humans, it must be doing the same to wildlife, only worse, since they don't get to live indoors with walls around them to break up some of the noise. The noise is yet another way that we're harassing and killing them with our roads, without even running them over. Researchers at Boise State University have found that birds near noise are skinnier.[18] Songbirds survive by listening constantly for the whir of falcons, the rustle of martens and the alarm calls of their neighbors, like the chipmunk that sees the goshawk before you do. When road noise drowns out sonic cues, birds must look for predators rather than listen for them. The "foraging-vigilance trade-off"

gradually depletes them: Every moment you're scanning for hawks is one you're not gobbling beetles. Think about that.

Also, we run them over. According to the Federal Highway Administration, there are more than 1 million wildlife-vehicle collisions every year in the U.S.[19] More than 4 million miles of public roads across the U.S. are dangerous barriers for wildlife seeking food, water, and mates.[20] Exposed and unsure about the noisy, unfamiliar terrain presented by an open road, an animal that hesitates or misjudges the speed of an approaching vehicle ends up as roadkill.

Roads also disrupt migratory routes, divide up ecosystems, and inhibit intermingling, confining entire species to ever-shrinking habitats and gene pools. A report by the U.S. Department of Transportation found that these crashes are the biggest threats to the survival of 21 threatened or endangered animal species, from reptiles like the desert tortoise to mammals like the San Joaquin kit fox.[21]

The furthest distance from a road in the U.S. lower 48 is just 22 miles, in Yellowstone National Park.[22] Think about that. That's not very far for ecosystems and species to live their lives in balance with each other and the land, untrammeled by people. Hell, I can walk that far in less than 12 hours. We don't have much space anymore that isn't fairly well carved out by roads, that chop up ecosystems for wildlife.

In California the sparse cougar population is so bound by roads and highways that they literally have nowhere to go, and are getting killed on roads as they try to find new territory. They're exhibiting uncharacteristic destructive behavior as a result of the stress, with adult males killing close relatives, and father-daughter inbreeding, that doesn't typically happen in a wild population.[23]

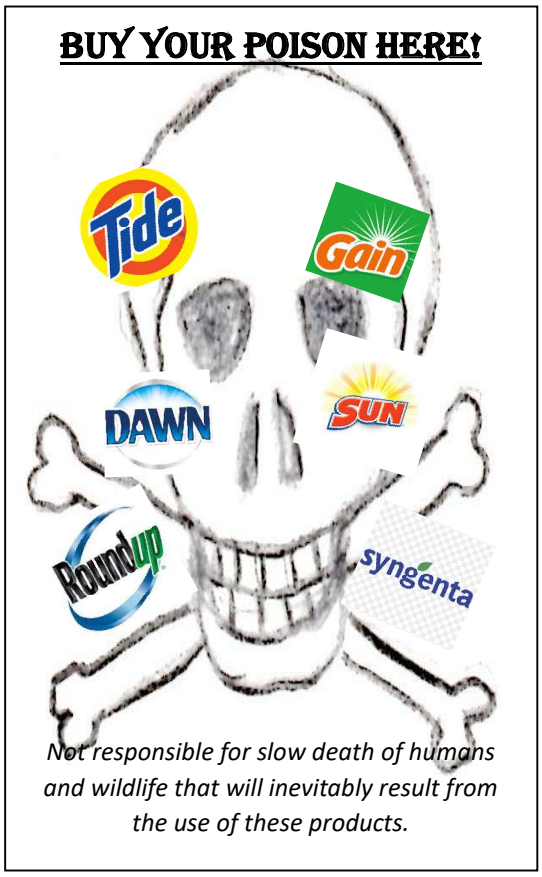
This is why we don't need creeps like those that occupy Island Park, ID and live along US highway 20, who are actually fighting initiatives to build wildlife bridge crossings. Seriously. They need to go. The last remaining scraps of wildlife that are left do not need these morons. They're resisting change and trying to protect their exclusive way of life, even though the busy highways are truncating and interfering with wildlife movement. Even though the crossings would have no impact whatsoever on them, would help wildlife a lot, and would even spare human lives. When deer, elk, moose, grizzly and pronghorn try to migrate across highways and can't due to traffic, they sometimes give up, and if they don't get to their summer or winter ranges, they begin to die off. More than a million large animals, and around 200 drivers, die annually from collisions nationwide.. It costs society around $6000 for a deer crash, $17,500 for an elk and more than $30,000 for a moose, due to costs of accidents, insurance, and losses of autos.[24]

Please help me understand how can you say no to saving wildlife, preventing accidents and reducing insurance costs? Evidently, the opponents are made up of entitled homeowners, led by a retired weapons engineer from Idaho National Laboratory, who want to "Keep Island Park Like It Is". They build their houses in the woods, then whine about the potential impact of fencing and bridges that would interfere with their views, while wildlife is dying due to their impact. Does it get more self-righteous than that? Think about that. Do you think this loser attitude is OK?

Death by Poisoning

My limited understanding of death by poisoning from reading too many Agatha Christy novels makes me think that it can't be fun. Unless it's an overdose of sleeping pills or heroin. Some of it involves dissolution of internal organs, agonizing pain, inability to breathe, or a slower death as you feel sicker and sicker with every passing day, until you finally expire, like cancer. Anyway. That's how we're killing a huge portion of wildlife these days. The poisonous pesticides that we're constantly applying to grow our food accumulate unregulated, and they don't biodegrade because they are mostly synthetic petrochemicals. These nasty chemicals kill pretty much all animal life in the applied areas and beyond, because they are dispersed into waterways and picked up by wildlife who dare to venture onto the treated land and naively consume any carcasses and barely surviving life forms that remain. Since these toxins are known to kill wildlife at extremely low concentrations, parts per trillion in many cases, they cause extreme long lasting damage. A lot like Chernobyl, but with poison instead of alpha particles.

In 2020, a total of 623,000 metric tonnes of pesticides were produced in the U.S. The category of pesticides includes all insecticides, herbicides and fertilizers used to grow crops and keep lawns and homes free of pests. This works out to an average of 360 LBS per square mile. If even half of this runs into our waterways, the average concentration would be about 90 parts per billion (ppb). This may not sound like much to the newbie, but in comparison to the known lethal concentrations of these chemicals that are in the parts per trillion range, which is a thousandth as much) this is really high. With concentrations like that, it shouldn't be much of a surprise that we're losing our wildlife.



Not responsible for slow death of humans and wildlife that will inevitably result from the use of these products.

And, that's just the pesticides. It doesn't include all the nutrients that run off our fields and farms, industrial pollutants, or all the products that we use in our home for cleaning and for body care that we spew every single day. Have you ever read the ingredients on a box of Gain or Tide laundry detergent, or Dawn dish soap? Actually, that was a trick question. Tide, Mountain Fresh, Signature Home, Arm and Hammer, Sun, Open Nature, Value Corner, and Gain, to name just a few companies, don't bother to list their ingredients on the label, because as big corporations they can get by without doing that. Evidently, they're allowed to use a

loophole, even though for the rest of us it's absolutely illegal to not list ingredients. I know. I have a small business, Aspire Colorado, that makes personal care and cleaning products that are free of toxins, and I'm required by law to list the ingredients.

Back to Gain and Tide, instead of a list of ingredients on the label, there's a link to their ingredient lists. I doubt most people would go to that trouble, but I did. And what I found was what I expected, both ridiculous and disgusting. The ridiculous part was that several of the links didn't even work, or took me somewhere that didn't have the information. Then I had to dig deep to find the lists. Who but an undiagnosed environmental OCD victim would bother with that? I know. I'm crazy. In some cases, some ingredients were listed as "proprietary", yet another loophole that big corp loves to use, to keep their precious products a secret so they can't be duplicated.

Now for the disgusting part. The really nasty ingredients that are toxic to fish and wildlife at extremely low concentrations are mainly about proprietary smells and colors and texture that have nothing to do with actual cleaning effectiveness. They're only there to make the product unique and special, to make brainwashed consumers want that product and no other. The problem is that these products always ultimately go down the drain, and from there to a wastewater treatment plant and then to receiving water bodies, like lakes, rivers and streams, where the wildlife has to live with them. Many of these toxins are not readily biodegradable, so by definition they can't be completely treated in a conventional wastewater treatment plant, where the entire process relies on rapid biodegradability and residence times are maybe a couple of days. When all of us choose to use these poisons, it accumulates very quickly. Think about that. What do you use in your home? Do you know the ingredients? Are you killing wildlife every time you clean? Do you feel good about that? Do you wonder how we have any wildlife left at all?

A recent study of more than 1,200 Golden Eagles showed that almost half of them showed evidence of exposure to lead, most likely from ammunition fragments ingested after hunters dress game in the field.[25] Of course, the eagles aren't the only raptors impacted by lead, they just happened to be the species that the study targeted. So here we are killing eagles with lead as essentially bycatch, that can easily be avoided with alternative lead-free bullets, but it seems that most hunters can't be bothered. After all, they're just birds, and the lead-free bullets are more expensive, and the birds aren't worth the extra cost. After all, we can't have hunters paying double for safer bullets, can we?

In the Great Lakes region, spraying of herbicides like Roundup by timber companies is sickening the animals in Lake Nipigon's watershed. New shoots are the moose's favorite food, their main food source in spring. The herbicides are poisoning them, as they flow into streams and beaver lodges, and now their inner organs are messed up. Livers that should be firm and meaty are gross, and deliquesce into a bloody sludge, sliding goopily when extracted. Same for rabbits, beavers and partridges.[26]

Water For Us Not Others

Wetlands and saline lakes are absolutely crucial for not only local wildlife, but are hugely important for migratory birds that stop along their journeys for rest and sustenance at these once-plentiful inland watering holes. In the U.S., most of these have been drained, and they have become some of the world's most threatened ecosystems, due to the irrigation systems that draw from the

freshwater rivers that feed them and the effects of climate change. Without substantial political action, they will continue to shrink. The Great Salt Lake is currently in the process of drying up, as one example, and if we lose these ecosystems, we can expect to also lose the birds that depend on them to extinction, such as phalaropes, snowy plovers, eared grebes and flamingos, which get their pink coloring from eating brine shrimp, to name just a few.[27] These lakes are drying up mainly due to water diverted from upstream water sources that supply the lakes, for irrigating hay and alfalfa for sheep and cattle.

Shoot Em Up!

The most obvious way we kill wildlife directly is by simply killing them, for food or entertainment, in the case of trophy hunting. BANG BANG BANG. Done and done. This is nothing new. We managed to eradicate wooly mammoths from the North American continent thousands of years before Europeans arrived, when the continent was yet sparsely populated with humans, long before guns were invented. Before the Europeans moved west and ran the native Americans off their own land, the great plains teemed with literally millions of bison in endless herds that filled the land as far as the eye could see. And we shot nearly all of them down and left them to rot, in order to starve the natives into submission. After the carnage, perhaps a thousand stragglers remained. The eastern skies were once filled with passenger pigeons, until we shot down every single one of them, mainly for entertainment. The Atlantic ocean was so packed with cod fish that you could practically walk on them, and we've fished those nearly to extinction.

These days, we continue to hunt, although permitting systems aim to prevent overhunting, though there is still plenty of poaching going on. In some places, killing of predators in particular is allowed, mainly in order to save their prey for ourselves.

In the U.S. we even have a Federal service provided by the Department of Agriculture, to get rid of wildlife that dares to interfere with human activity on land we took over for our endless wants and needs. This is agency is called "Wildlife Services", a bit of a misnomer since they more accurately serve mainly farmers and ranchers and sometimes homeowners by getting rid of wildlife that inconveniences them. Some wildlife is relocated, but most are simply shot in place.

Table 2 is a small sample of examples of "euthanized" wildlife that were shot in 2021 for different offenses to humankind.[27] For example, red-winged blackbirds are slaughtered because they eat sunflower seeds, corn and other crops, bobcats are killed for dining on wild turkeys, and wolves and bears are killed for eating cattle and other livestock that ranchers replaced their original food with, giving them little choice but to eat what's left. We take over the land in a futile attempt to feed our overly massive human population, we plow under the food that the wildlife once foraged, replace it with crops and domestic livestock, and then shoot whatever wildlife is still around if they dare to attempt to eat. I mean, seriously, is that fair? Think about that. Do you support that? Does that seem ethical to you?

Again, this is just a small sample of the hundreds of species that are routinely "removed" by Wildlife Services. And, sadly enough, the wildlife that is directly killed, including hunted, is a minor portion of the wildlife we kill indirectly via the other pathways in Table 1. Also, the list doesn't include insects that are getting decimated faster than any other life form, by far.

Table 2 – Wildlife Killed by Wildlife Services - 2021

Animal	Number Killed	Animal	Number Killed	Animal	Number Killed
Badgers	227	Black Bears	421	Beavers	24,683
Red-Winged Blackbirds	15,096	Bobcats	595	Coyotes	63,965
Wolves	324	Prairie Dogs	10,775	Armadillos	324
Brewers Blackbirds	3,529	Red-crested Cardinals	1,111	Cormorants	9,642
Sandhill Cranes	54	Doves	37,277	Egrets	6601
Falcons	510	Foxes	2,653	Bullfrogs	253
Geese	26,977	Gulls	17,632	Hawks	2,665
Herons	759	Iguanas	3,795	Marmots	1,839
Meadowlarks	2,243	Ospreys	148	Otters	714
Pelicans	80	Sandpipers	321	Vultures	18,459
Woodchucks	1,830				

It turns out that the World Wildlife Fund supports hunting of predators. While they keep decent records of wildlife numbers, it's not so much to save species, but more about protecting species sufficiently so they can be trophy-hunted. For example, they fully support the murder of polar bears. On the one hand, we have polar bears as one of the poster species that represents the beautiful beasts we are driving to extinction with global warming, and on the other hand, the WWF supports killing them for body parts and trophy hunting. Naturally, the underlying dark belly of this particular organization is supported by (you guessed it) ultra-wealthy trophy hunters.[28]

Cook 'Em

Global warming driven by our massive numbers and associated carbon emissions is pushing huge numbers of species to the brink of extinction, and they will probably be completely gone by the end of the century if we don't reduce our numbers. And maybe even if we do. Many may not even last another decade. It might be too late now, and the longer we wait, the lower any chance of mitigation will become.

Warmer temperatures are disrupting metabolism of wildlife that is adapted to temperatures in their regions, and different species are impacted in different ways. The list of species is endless, but here are a few examples to give you an idea of the kinds of problems wildlife faces.

In regions that are already hot, and now getting hotter, meerkat pups are growing more slowly and adults are dying earlier, a trend that seems to be worsening. And it's more than just the heat, when rain falls in dry areas, the grasses are impacted, and ants and termites decline, which badly stresses insect-eating animals like meerkats.[29]

In the Rocky Mountains, native pine bark beetles are no longer dying off in winter because the temperature isn't as cold, and now they're out of balance, killing hundreds of thousands of lodgepole, ponderosa, Engelmann spruce and other evergreens. The excessive deadfall provides more fuel for fires, resulting in more and hotter fires.

Climate change is heating up national parks faster than the rest of the country, because they tend to be at higher elevations and further north, where temperatures are increasing faster. National parks have served as safe havens for wildlife diversity, lynx, wolverines and other high-elevation mammals that are now being pushed into smaller and smaller areas as they try to move up in elevation, seeking cooler air. High altitude animals like marmot, mountain goat, pika, marten and snowshoe hare are struggling. Marmots have actually been freezing to death in some cases, because light snows can diminish the cocoon effect that insulates their burrows.

During summer heat waves, desert songbirds are already facing lethal dehydration several days per year in some places. By the end of this century, desert birds may face dehydration across their ranges. Even worse, birds with smaller ranges will have more unpredictable water sources in the hot, dry desert, where the trees they need for cooling shelter will die for lack of moisture. Obviously, all this will stress the birds and cause a more rapid drop to extinction, with no hope of return at that point.[30] But now we really do have a chance to mitigate some of this. Why would we not? Why are we arguing about this? How can it be OK to lose our birds because of our own complacent choices and inaction?

Warm fall temperatures also slow spring egg-laying for amphibians like tiger salamanders. In Alaska, musk oxen are born smaller and smaller, because as melting snow refreezes, it coats the vegetation that the pregnant cows need with ice, and they can't paw through snow to eat like they used to.

Wildfires are now more frequent and burning hotter with global warming, killing yet more wildlife. In Australia, estimates for the 2019 fire season, the worst in history, estimates that nearly 3 billion vertebrates were killed or displaced, including mammals, reptiles, birds and frogs.[31] In California, severe wildfires fried 4.2 million acres in 2021, and while damage to humans and property is well-documented, we didn't hear much about the wildlife damage. Which is sad, since California is the most biodiverse state in the U.S., and home to numerous at-risk species. Did you think that humans and their homes were the only victims in these fires? If so, think again.

Yet another consequence of global warming is the changing of the seasons that drive all wildlife behavior. Think about that. Essentially every biological process on the planet lives and dies by a clock. The seasons drive everything from mating and egg-laying to birth, flowering, food availability, pollination schedules, and migrations. Now global warming is shifting the seasons, causing spring to come earlier and fall to last longer, which is messing up the wildlife. Centuries of evolution have refined these patterns, and now climate change is recalibrating them. This phenomenon is impacting life for almost all wildlife across the globe, in every ocean and on every continent. Earlier warmth, delayed cold, and shifts in the frequency and strength of precipitation are changing established rhythms in unanticipated ways.[32]

- Flowers are blooming several weeks earlier, and some are killed off by fluxes of frost. Leaf appearance and leaf dropping has shifted dramatically across more than half the planet.
- Birds and pollinators often respond to seasonal light, which hasn't changed at all as the temperature has changed, so they may arrive or emerge earlier or later, and miss the pollination windows, or seeds, causing severe declines in populations.
- Species are not responding identically. Too many patterns are shifting at the same time, each influenced by countless others, which are themselves also in motion. It's everything, everywhere, all at once. Some pollinators may switch to different plants, while others may not.

- From 2015 – 2016, up to a million common murres, large seabirds, starved to death along the United states' West Coast, their emaciated carcasses washing up on beaches. A severe ocean heat wave made more likely by climate change had altered timing cycles for their food.
- Humpback whales in the Gulf of Maine are gathering 19 days later than they once did, while jack mackerel, hake, and rockfish are spawning earlier in the North Pacific.
- Snow is melting earlier and arriving later, which devastates mammals whose color transitions are triggered by seasonal shifts in daylight, which of course isn't changing at all. Snowshoe hares, Siberian hamsters, collared lemmings, and long-tailed weasels all turn white in winter as a form of protective camouflage in snow. Now they're often out of sync with their surroundings. Many are increasingly seen with their bright white bodies glowing in green forests or brown brush or on yellow tundra.
- With sea ice melting earlier, polar bears spend more time on land. Grizzly bears already are venturing farther north.
- Globally, the market of insect-pollinated crops, such as cacao, watermelon, cumin, and coriander, are worth up to $577 billion annually. Changes to nature's clock also may influence agriculture in dozens of hidden ways, not all of which can be addressed by shifting harvest seasons. Farms may be exposed to more frosts or previously unseen crop-killing pathogens.

Shake 'Em Up

Research has shown that industrial noise, like oil well pumps and gas well compressors in remote locations stress wildlife, for instance, how birds nest. Recent noise pollution research shows that acoustic degradation of the environment has a clear physical impact on birds, literally increasing stress hormone levels and survival rates.

A recent light pollution map of the lower 48 states shows there is so much light at night that there are only 3 places left that one can see a truly dark night sky – eastern Oregon/western Idaho, western Utah/northeastern Nevada, and the Colorado Plateau, 100,000 square miles of high elevation desert surrounding the Grand Canyon. Most Americans have never seen the Milky Way, because they live in cities where there is too much light. And night light is even suspected of disrupting human hormonal balances, exacerbating hormone related diseases, including some cancers, such as breast cancer. So, if it's impacting us, what's it doing to the rest of the species who have to live in the artificially lit-up world that we have created? Is it that much of a stretch to think that our light pollution is impacting wildlife too?

Wild mammals have increased the amount of time they are active at night by 40%, because of human activities. Researchers' findings were consistent across species, continents and habitats. 75% higher than normal light pollution is one of the culprits behind the enormous decrease in the biomass of flying insect populations.[33]

Wild animals are meant to be wild, yet some of us seem to think it's fine to take a cute exotic animal and make a pet out of it. How would you like to be ripped out of your world and stuck in somebody's cage for their personal entertainment? And eat whatever they feel like feeding you? And just sit there by yourself until your keepers decide to play with you? Taking wild animals as pets is far too prevalent and is exacerbating the population decline of impacted species. Cute mammals, like slow lorises, are rare and are not amenable to being a pet. Most species just need to be wild. And with our population growing out of control, there are too many of us demanding pets. While dogs and cats are one thing, birds, monkeys, snakes, and predators such as lions and bears will never be happy in a cage or a pen, and what right do we have to do that to them?

My husband, Hilary, once worked as a chef at a famous restaurant called The Fort, in Morrison, Colorado. The previous owner, Sam, had taken a baby black bear as a pet, and when the bear, Sissy, was little and cute, she was often with Sam in the restaurant, entertaining the guests. When my husband worked there, the previous owner had left and couldn't take Sissy, and she had grown up. So, she lived a miserable life in a little cave with bars barricading the entrance, and was constantly harassed by the new owners' dogs. One morning, when Hilary was baking muffins in the kitchen, Sissy broke out of her cave and busted down the kitchen door, driven to a frenzy by the dogs. Hilary managed to save himself by throwing muffins at her, until the dogs barked from outside and distracted her. After that, Sissy was chained within her cave to prevent her from escaping again.

Trapping of wild songbirds in Cuba for illegal singing competitions is decimating the populations of songbirds in Cuba.[33] Parrots are another example of the impact of our sheer numbers on bird species. The demand for pets, coupled with deforestation and habitat loss, is the primary driver of parrots' imperiled status. All but four of about 3590 species qualify for protection under the Convention on International Trade in Endangered Species, or CITES. African grays are one of most popular, and at least 1.3 million have been exported from 18 countries.[34]

Butterflies may not be pets, but evidently a lot of humans like to collect their dead bodies, and since there are way too many of us doing that, we're even decimating rare species of butterflies by collecting too many of them. That's when you know it's bad. I mean, do you think butterfly collecting would be a problem if there weren't so many of us doing it? And, a lot of the actual collecting is done by locals trying to scrap out a living in their overpopulated, food-stressed lives. They hunt and collect the butterflies, then sell them to foreign collectors. Swallowtails, some of world's largest butterflies, are some of the most threatened, and are being driven to extinction because of habitat loss and climate change in addition to overhunting for collectors.

In New Zealand, invasive species brought in by humans have driven most of the bird species, including the kiwi, the national bird, nearly to extinction, with an overall population loss of 80%. 94% of reptiles and two of the three native species of frogs are in the same condition. New Zealand had been isolated for so long that many species evolved over millions of years, in a land without terrestrial predators, so they didn't evolve to live with the species that humans brought in, like rats, stoats, possums, weasels and ferrets. The weasels and ferrets were brought in to control populations of other species, like rabbits, yet another example of how well it *doesn't* work when man tries to control nature.

Nature always finds a way, and it's usually in the form of an unanticipated and unpleasant effect that we didn't really want and that does more harm than good. Now man is again trying to control

nature, by removing the predators, one possum at a time. Since New Zealand has a land area of 100,000 square miles, this is quite the national level endeavor, involving numerous paid and volunteer staff, and many varieties of clever traps and such. The entire effort is estimated to cost more than $6 billion, and if reclamation cost estimates of other species are any indication, it will probably be double that, at least, since reclamation costs are always over budget. So far, they've managed to eliminate about 2 million invasives, and hope to complete the project by 2050.[35]

Hawaii has also lost about 50% of its birds to invasive species, in addition to habitat destruction and pesticides.

We're also passing diseases to wildlife. Minks are being farm-raised for pelts in several western states, providing around 1 million mink pelt products. Covid jumped from an infected farm worker to the minks, then to wild minks, and nobody knows where it will go from there. Disease spillover from domestic animals to wildlife is a major way we're killing off wildlife. Part of the reason is there are far too many domestic animals in lands where the wildlife are doing their best to live, and part of it is the way we confine and exploit wildlife. We need to give them their own space and leave them alone.

If we leave wildlife to function as it does naturally, without any interference from us, spillover of diseases from wildlife to humans are actually reduced. By a lot. A great example is in western New York state, which has a significant population of deer, which are known to carry Lyme disease, a common disease that readily infects humans. Yet, because foxes are abundant, cases of Lyme disease in humans are rare. It turns out that the foxes keep the rodent population in check, which keeps the Lyme-carrying tics in check, so the deer carry less of them. Who'd have thought?[36]

On the other side of things, the mammalian livestock that humans eat carry a whopping eight times more zoonotic diseases than wild mammals. This is due to the shear mass of livestock, which is now 60% of all mammalian biomass, domestic and wild alike, on the planet, and the crowded conditions into which we cram them into feedlots as we fatten them up for market. For instance, in 2009, a new influenza virus from pigs infected humans in Mexico, and set off a global pandemic.[37]

Big Horn sheep were nearly wiped out in the American West by the 1940's from disease and habitat loss. The Tasmanian Devil is down to less than 25,000, dying from a fatal infectious form of cancer. In Florida, panthers and bobcats are down from a weird neurological condition with a working name of feline leukomyelopathy, that nobody knows the cause of. The animals stumble or have trouble walking, and severe cases cause paralysis, starvation and death.

Many species have been driven to such low populations that recovery may not ultimately be possible, because of the loss of genetic diversity. In a 2019 study, after the Florida panther population dropped to just 20 animals in the 1970's, the decline in genetic diversity got so bad it was visible.[38] Animals were born with holes in their hearts, undescended testicles, kinked tails and other physical abnormalities. And cougars aren't the only species with genetic deformities – inbreeding in bobcats, lizards and even a bird species are causing visible physical deformities.

So, given all this depressing information, do ya think we might be decimating our wildlife? Do you think that might be a problem? Do you think all will be good if we go on with business as usual and ignore this for another 10 years? Do you think we should maybe do something about this? If so, what?

If not now, when? Luckily, it turns out that the options we have for saving our wildlife are as simple, basic and endless as those for reducing our carbon emissions and saving our planet. Read on. You'll see!