

Chapter 1
The Human Population Explosion
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The massive growth in the human population through the 20th century has had more impact on biodiversity than any other single factor.

--Sir David King, science advisor to the British government

In those few words, Sir David King wraps up the last hundred years better than anyone else has. It is the blunt truth.

It is why those of us who cannot live without wild things must once again work to freeze and then lower the population of Man worldwide.

Complex animal life evolved sometime before 500 million years ago. Plants came a little later. Since then, the tree of life has grown up and out into all kinds of odd and far-flung boughs, limbs, twigs, and leaves. Now, though, is a stand-alone hour in this awesomely long tale of life. Never before has there been a being such as us—one with the might to swiftly and thoroughly remake the world. Only those who are blind to the wildworld can look about and not feel dread as swelling thousands of other kinds of Earthlings are shoved off into the dawnless night-pit of extinction. Please recall: all living things on Earth from bacteria to ravens are Earthlings no less than are we.

In the half-a-billion years of shelled and backboned wights and sundry green worts, five breathtakingly big extinctions show themselves as we peel away geological

layers.¹ Each of these five big die-offs was brought on by blazing iceballs zipping through the solar system to hit Earth or by the brawny shoulders of geology shoving continents hither and yon. Biologists and conservationists call today's extinction the Sixth Mass Extinction, owing to its sweep and heft. This extinction stands alone, however, since cosmic or geological might does not bring it on as they have with the other big extinctions. Instead, it is brought thoughtfully and willfully by one kind of life, warring against all others.²

Today's Great Extinction has a living scythe with which to mow down life.

One species.

Homo sapiens.

Us.

Man.

Given its seed, and heeding our lodestone of goodness, truth, and fairness, maybe we should not call today's ecological crash the "Sixth Mass Extinction." Perhaps instead we should call it the *First Mass Murder of Life*.

How out of kilter is today? Never before has one kind of being broken out of its home ecosystem(s) to become a mighty throng sweeping over Earth to almost everywhere, and then scalping and remaking those wild neighborhoods. Never before has one kind of life gobbled up so much of all other life and of what that life needs to live.

¹ *Wight* is an earlier English word for creature or being. I use it for animal and for a fellow or individual Man.

² Dave Foreman, *Rewilding North America: A Vision for Conservation in the Twenty-first Century* (Island Press, Washington, DC, 2004). In Part A of *Rewilding North America* I look in depth at extinction.

Never before have so few become so many and in a flash spread over the whole world—with billions now standing where thousands once stood. For every *Homo sapiens* alive 50,000 years ago, there are one million alive today. In other words, our kind has grown a million-fold in 50,000 years. It's something like the scene in Walt Disney's movie *Fantasia* where Mickey Mouse, playing the "Sorcerer's Apprentice," fecklessly waves the sorcerer's wand and clones an unstoppable gang of exponentially multiplying brooms toting buckets of water and flooding the wizard's workshop. So do we flood Earth with ourselves. (See Figures 1.1 and 1.2.)

[Insert graph of Man's pop growth; and graph of Man and tiger population change in 1900s.]

When we were a little fewer than six billion, ecologists reckoned that we were already taking more than 40 percent of Earth's Net Primary Productivity (NPP). NPP is the yearly sunlight striking Earth that photosynthesis in plants makes into energy that other life can then take to make biomass (see Box 1.1 and Box 1.2). **[Insert box on NPP; do box on NPP and biomass from Pimm.]** We are now almost seven billion. Demographers foresee we will soon zoom to nine billion or more. When we are that many, how much of NPP will we take? Sixty percent? More? What will be left for everything else? We are doing more than hogging the interest; we are using up life's capital—taking away what is needed by deep-diving squid and by the geese that fly over the Himalayas, by pond duckweed and by rock-gripping bristlecone pines up where the air is thin. We are wiping out the building slabs evolution needs to play out its unfathomable, uncanny yet-to-be. And what if we go to twelve billion?

In 1974, physicist John P. Holdren and biologist Paul Ehrlich, then both at

Stanford University, set down in *Science* the key scientific formula of our time: $I=PAT$.³ Paul and Anne Ehrlich later spelled out what it means, “The impact of any human group on the environment can be usefully viewed as the product of three different factors. The first is the number of people. The second is some measure of the average person's consumption of resources....Finally, the product of those two factors...is multiplied by an index of the environmental disruptiveness of the technologies that provide the goods consumed....In short, Impact = Population x Affluence x Technology, or $I=PAT$.”⁴ (See Box 1.3.) For the long-term health of the web of life, $I=PAT$ is more meaningful than $E=MC^2$. I'll hearken back to $I=PAT$ often in the pages to come. When I use them as bits of $I=PAT$, I'll capitalize Impact, Population, Affluence, and Technology. I see Impact (I) as the harm we do to other Earthlings, or as ecological wounds. Others, such as the Ehrlichs, may see Impact as harm to the life support system Earth gives Man. **[insert box on $I=PAT$]**

THE WORST WOUND OF OVERPOPULATION

In this short book, I hope to show lovers of wild things that Man's population blow-up shrivels and shatters the dazzle of wild things that dwells on Earth. Unlike most books that have warned of overpopulation, I will spend little time on tales about coming starvation, breakdown of civilizations, running out of oil, and wars and anarchy over dwindling raw goods. It's not because I pooh-pooh these likelihoods, but because the most dreadful and unforgivable outcome of Man's population explosion is what we are

³ John P. Holdren and Paul R. Ehrlich, “Impact of Population Growth,” *Science* vol. 171 (1974), 1212-17.

⁴ Paul R. Ehrlich and Anne H. Ehrlich, *The Population Explosion* (Simon and Schuster, New York, 1990), 58.

doing to other Earthlings. And it isn't something that might happen in years to come; it is happening right now. Professor Eileen Crist of Virginia Tech warns that "it is not our survival and well-being that are primarily on the line, but *everybody else's*."⁵ She is right. Nonetheless, most who have written about overpopulation have underplayed and overlooked the way our growth drives the end of the wild ones. Owing somewhat to that wrong step, conservationists have mostly stopped working on overpopulation. Many who ward wildernesses and shield endangered species don't seem to think about why population stabilization should be a conservation chore, although only forty to thirty years ago most conservationists knew it was. On the other hand, wherever I give talks today, I find some in the crowd who ask how can we hope to keep or rebuild wildlands and wildlife if we don't halt growth.⁶ They are right. Without freezing human numbers, we can't keep our National Parks, we can't stop the loss of polar bears and elephants and whales, and we can't hope to put the brakes on greenhouse gases and halt climatic Ragnarok.

THE POPULATION EXPLOSION IN A NUTSHELL

Sixty-five thousand years seems like forever, yet it is a finger-snap in geological time. Maybe our handicap comes from having a lifespan of only seventy or so years. But walk with me as I slog back 65,000 years. Then there were more than ten kinds (species⁷) of great apes: in east and southeast Asia, two kinds of orangutans, two or more kinds of *Homo erectus* offspring, and tiny little folks (Hobbits) on Flores and other

⁵ Eileen Crist, "Limits-to-Growth and the Biodiversity Crisis," *Wild Earth*, Spring 2003, 65.

⁶ Instead of writing *population growth* over and over, I will mostly write *growth* only. If I'm talking about some other kind of growth, I'll say so.

⁷ *Kind* has long been used in English, even by Darwin, to mean *species*.

islands; in Africa, two gorillas, chimpanzees, bonobos, and likely two hominin kinds, one of which was becoming us—*Homo sapiens*; and, in Europe and western Asia, Neandertals. Also, maybe, in central Asia, another kind of *Homo*, not us and not Neandertal.⁸ Of the species in this great ape clade, who do you think was fewest?

It was likely our forebears. Genetic and other scientific work shows that there were fewer than 10,000 of the elder *Homo sapiens* living 65,000 years ago—maybe only 5,000.⁹ Fifty thousand years later, we had spread out of Africa to Asia, Australia, Europe, and the Americas. Only Antarctica and a few out-of-the-way islands were yet without us.¹⁰ In a few more thousand years we were building yearlong settlements and starting to grow wheat and peas. We had already brought some wolves into our packs and would soon tame goats and sheep. Some little desert cats would tame us. Our tally had climbed to a million or so by then, about ten thousand years ago. By that time, our nearest kin—the three to six other *Homos*—were gone, and we likely had much to do with their going. The Sixth Mass Extinction was going full tilt with the killing of big wildeors wherever we newly showed up.¹¹

Another way to look at it is that 50,000 years ago, there were more tigers than *Homo sapiens*. More gorillas, more chimpanzees, more orangutans, more blue whales, more jaguars, more white rhinos.... Today, for every wild tiger on Earth, there are *two million* human beings. Sit quietly with your eyes closed and hold that turnover in your head for a minute or two.

⁸ *Hominin* is a rather new term human paleontologists use for species in the kinship group of Man, not that of other apes.

⁹ Nicholas Wade, *Before the Dawn: Recovering the Lost History of Our Ancestors* (The Penguin Press, New York, 2006), 52.

¹⁰ Man found Iceland, New Zealand, Madagascar, and Hawaii only in the last two thousand years or less.

¹¹ Foreman, *Rewilding North America*.

Father-son historians William and J. R. McNeill write, “By the time the first metropolitan web was forming around Sumer some 5,000 years ago, the earth hosted perhaps 10 to 30 million people.”¹² The widely acknowledged world population of us for 1 C.E. is 250 million.¹³ By 1700 C.E., about the time Benjamin Franklin was born, we had grown to 610 million. Throughout this time of preindustrial civilization, heavy childhood deaths and the “occasional demographic crisis” (epidemics) slowed the dash of growth.¹⁴ As did our bloody swords and spears.¹⁵

So. Sixty-five thousand years ago: we were less than 10,000. Ten thousand years ago: 1,000,000. Five thousand years ago: 10,000,000 to 30,000,000. Two thousand years ago: 250,000,000. Three hundred years ago: 610,000,000. Our population grew sturdily, but pretty slowly and over many, many years. Yet it grew fivefold. For every Man 65,000 years ago, there were 100,000 in 1700 C.E. (See Figure 1.3.) Soon, however, our population growth was to *explode*.

Physician and University of Colorado anthropology professor Warren Hern wrote in 1999 that

[T]he human population doubled 4 times from A.D. 0 to 1976, with the doubling times dropping from 1650 years (est. 500 million at 1650 A.D.) to 46 years (from 2 billion in 1930 to 4.29 billion in 1976). People who are 40 years old or more in 1998 are among the first people in history to have lived through a doubling of world population;

¹² McNeill and McNeill, *The Human Web*, 221. Sumer, between the Tigris and Euphrates rivers, is the first known city.

¹³ J. R. Weeks, *Population*, 29. C.E., by the way, means *Current Era*, and is written instead of A.D.

¹⁴ McNeill and McNeill, *The Human Web*, 221.

¹⁵ Steven A. LeBlanc with Katherine E. Register, *Constant Battles: The Myth Of The Peaceful, Noble Savage* (St. Martin's Press, New York, 2003).

*people who are 75 years old have seen the human population triple.*¹⁶

Earlier Hern wrote:

*As of 1993, we have added more humans to the total human population of the world in the past 40 years than we added in the previous three million years. The human population has quadrupled in the last century. Between seven and 8% of all human beings ever born are alive today. Until recently, the rate of growth of the human population has been increasing, which means that it exceeds even exponential growth.*¹⁷

Please stop reading for a bit. Sit back and let Hern's words sink in. They ought to jar your mind.

Man's population grew more in the last forty years than in the previous three million.

This is why we talk about the human population *explosion*.

The population bomb has blown up—but the shrapnel hasn't yet hit us. What it has hit are wild things. It has also hit children, women, and men, but of the poorest of the poor.

¹⁶ Warren M. Hern, "How Many Times Has the Human Population Doubled? Comparisons with Cancer," *Population and Environment: A Journal of Interdisciplinary Studies*, Vol. 21, Number 1, September 1999, 59-80. (Population doubling time is the number of years it takes a population to double.)

¹⁷ Warren M. Hern, "Has The Human Species Become A Cancer On The Planet?: A Theoretical View Of Population Growth As A Sign Of Pathology," *Current World Leaders: Biography & News/Speeches & Reports Issue*, Vol. 36, No. 6, December 1993. Hern references N. Keyfitz, "The Growing Human Population," *Scientific American*, 261(3), 1989, 119-126; United Nations, "The 1992 Revision of World Population Prospects," *Population Newsletter*, no. 54 (Population Division, Department of Economic and Social Development, United Nations Secretariat, New York, 1992); J. R. Weeks, *Population: An Introduction to Concepts and Issues*, fifth edition (Wadsworth Publishing Company, Belmont, CA, 1992); P. Demeny, "The World Demographic Situation," in J. Menken, ed., *World Population & U.S. Policy* (Norton, New York, 1986); A. A. Bartlett, "Forgotten Fundamentals of the Energy Crisis," *American Journal of Physics* 46(9), 1978, 876-888.

HOW HIGH WILL HUMAN NUMBERS GO?

No one gainsays that our population has grown since 1700. Nor is anyone believable at odds with the exponential growth curve of human population. Where the clash comes is with forecasts, with cornucopians saying that population growth is slowing, even as they say such growth is not a worry. (A wise one knows to raise an eyebrow when tossed this kind of two-sided dodge.) Some of the wrangle comes from the handful of ways to reckon population growth: rate of growth, whether the rate of growth itself is going up or down (and by what speed), how many hungry mouths added each year, number of women coming into their baby-making years, population doubling time, and so on.

Biologist Garret Hardin laid out why we need to look at all of these kinds of population growth. Say that the *percentage rate* of growth slows from 2.1 percent to 1.7 percent a year over a few years while the *absolute rate* of yearly growth goes from 64 million to 79 million to 93 million in that time. How can this be? *Because there are more women giving birth at the lower rate.* Hardin wrote in 1993, “The absolute rate of increase has increased every year since the end of World War II. It is the absolute increase, rather than the relative rate, that stresses the environment.”¹⁸ In 2009, about “75 million more mouths” than in 2008 were pleading for food.¹⁹ It will be much the same in 2010, with another 75 million more hungry ones than in 2009. And so it goes.

Conservationists need to understand this. Thinking that a drop in the population growth rate means that population is not growing is a warning that our schools are no

¹⁸ Garrett Hardin, *Living Within Limits: Ecology, Economics, And Population Taboos* (Oxford University Press, New York, 1993), 11-12.

¹⁹ John Cairns, Jr., “Silence That Kills,” July 21, 2009, www.johncairns.net.

longer teaching arithmetic.²⁰ Maybe one can forgive journalists and the public for being mathematical dolts, but economists should be deft in numbers. Yet, amazingly, some economists and other social engineers now fear that population is falling and this will lead to all kinds of lousy things—socially and economically. I'll deal with these “birth dearth” collywobbles later.

Another way to look at population is by population age structure. Even if there is a drop in the growth rate, national population still rises for many years. Why? As big “age cohorts” go through their childbearing years, they have many, many children. One-third of Earth's population in 1995 (2 billion) was under fifteen years of age, while only about five percent of it (300 million people) was over sixty-five. The youngsters will make far more babies in the next years than how many oldsters who die, thereby population will grow.²¹ With such a landslide of youngsters coming into their breeding years, even if they right away go to having only the replacement rate of 2.1 children per woman, it will take two or three generations or fifty to seventy-five years before population stabilizes.²² In many African countries today, between 40 and 50 percent of the population is under fifteen years of age. With that lopsidedness, forecasts for growth in these sorrow-lands are breathtaking, if not unbearable.

This is yet another twist. Population does not grow evenly over the world. While Italy, Japan, and Russia may have ended their growth, elsewhere—Africa foremost—

²⁰ We see this same woodenheadedness when people think that were we to lower the tons of greenhouse gases being pumped into the atmosphere every year it would mean that the percentage of greenhouse gases in the atmosphere was going down.

²¹ Anne Ehrlich, “Implications of Population Pressure on Agriculture and Ecosystems,” *Advances in Botanical Research*, Vol. 21, 1995, 84.

²² J. Kenneth Smail, “Confronting A Surfeit Of People: Reducing Global Human Numbers To Sustainable Levels,” *Environment, Development and Sustainability* 4, July 2002, Kluwer Academic Publishers, the Netherlands, 24.

growth is unbelievably high. Take forlorn Ethiopia, where hunger stalks the land like a marrow-sucking wraith; Ethiopia had fewer than seven million souls in 1950, had forty-two million when it had its Earth-shaking famine in 1984, has nearly eighty million today, and is slated to have about 145 million in another forty years. (See Figure 1.5.) This is why I write *unbelievably high*. [Graph of pop growth in Ethiopia 1950 to 2050] Later, in Chapter 4, Table 4.1 will show population growth for some countries of high biological diversity, high extinction threats, and high growth. After cobbling it together, I had to make myself a stiff drink.

Another piece of the puzzle mostly overlooked is “that ongoing global gains in human longevity will continue to make a major contribution to world population expansion over the next half-century, *regardless of whatever progress might be made in reducing fertility.*”²³ (My emphasis.) This is a big deal, but few think about how it grows population.

Thirty and forty years ago, so-called “doomsayers” such as Paul Ehrlich and Garret Hardin woke up governments and workaday folks alike with their warnings. Birth control of all kinds became widespread in the 1970s. Good work was done—at least for a while. But in no way has the population bomb been defused. As we’ve seen, we add some 75 million more Man-mouths every year. That is 750 million every ten years. Go back a few pages. Three hundred years ago, the whole world of Man was 610 million. We are adding more than that every ten years. Don’t believe those foisting tales that the population bomb has fizzled.

So. What is the answer to this section’s heading? How high will world population go? Uber-Pollyannas pop off about leveling off at 8 billion by 2050 without

²³ Smail, “Confronting A Surfeit Of People,” 24.

enlightening us how this will happen (we're already at 7 billion). Establishment projections seem to hover about 9.2 billion. But Dr. Joseph Speidel of the University of California's Bixby Center for Reproductive Health Research & Policy warns, "If birth rates remain unchanged, world population will grow to 11.9 billion" by 2050.²⁴ The "official" projections of 9.2 billion by 2050 are grounded, then, in the belief that birth rates will somehow go down. But will they without hard work? Or something awful?

Human population, then, has exploded gruesomely in the last two hundred or so years. It will keep shooting up for some time. So what?

In the next chapter we'll look more sharply at what is truly at stake.

²⁴ J. Joseph Speidel, MD, Cover Letter for "Family Planning and Reproductive Health: The Link to Environmental Preservation," January 18, 2008.