

# Population, biodiversity, and human well-being

The zero-sum game for the limited surface of Earth has an overwhelming favorite – humans and their well-being, broadly writ. Biodiversity and habitat conservation to support the shrinking array of species may win minor battles in the competition for solar energy and physical space, but biodiversity will lose the war, as long as humanity continues to grow. This conclusion is not new, but recent sobering news about population trends, climate change, and mitigation proposals reinforces it.

Over the past decade, the United Nations has raised its medium population projection for 2050 from 8.9 to 9.2 billion (the current population is 6.8 billion); 300 million additional people will eat a lot of food, use more energy, and do major damage to ecosystems and species. More disturbing is that those UN projections are based on the unfounded and unlikely core assumption that the “total fertility rates” of all countries will mathematically converge at 1.85 children per woman shortly after 2050 and then hold steady.

In a world where national fertility rates range from 1 to 7 children, a spread similar to the norm in the 20th century, it boggles the mind to envision reproductive conformity within a few decades, let alone a long-term global below-replacement fertility level of 1.85 (~2.1 children is replacement fertility in a healthy modern society). For decades, UN demographers used 2.1 as the “magic number” to which all societies would inevitably hew, but they lowered that by a quarter child last decade, after observing that many European and Asian countries had not actually towed the modelers’ line and halted their fertility slide at 2.1, instead falling to 1.5 or below. The demographers’ overreaction was to cut the global fertility projection to 1.85.

What does this have to do with biodiversity? A great deal. Almost every conservation plan outside of zoos depends on safeguarding sufficient habitat to support viable populations and ecosystems over the long run, through the calamities of an erratic planet. Biodiversity cannot become more space- and energy-efficient the way humans often have. Conservationists can sometimes overcome habitat loss and genetic bottlenecks and prevent extinctions by artificial techniques, such as captive breeding programs, invasives management, and ecosystem manipulations, but such solutions are expensive, risky, and temporary. In a crowded and climate-challenged world, conservation competes with both human food and solar/biofuel energy for surface area and sunlight.

Space is still the final frontier, and we are the champions of the world, growing by 79 million people per year, continuing that pace for at least another two decades, even under the rosy UN assumptions (the US Census Bureau makes similar projections). The projected decline in growth later this century depends entirely on two unrealized dreams: universal access to and use of effective contraception and a global desire to average less than two children per family. We are far from achieving the former – roughly half of pregnancies, even in the US, are unintended. As to the latter, desired family size in many key developing countries is still 3 to 7 children and barely budging. Yet global interest and funding for slowing population growth are declining. Population policy is virtually absent from the agenda of the 2009 Copenhagen climate conference.

But won’t human ingenuity overcome these demographic challenges, as we perpetually find ways to do more with less space and energy? Probably not. In the past 40 years, every global gain in energy efficiency has been accompanied by increases in affluence. Global and US per capita CO<sub>2</sub> emissions are almost exactly what they were in 1970. Emissions have grown with population, which has almost doubled. If we slow fossil-fuel use to protect the climate, we have to go back to the land (and water) for energy – and the zero-sum game.

Because the space needed to preserve remaining biodiversity is more or less fixed, the remaining major demands – food, fiber, wood, and fuel – must continuously become more space-efficient, as population grows. That is a wonderful dream, but it’s an oil-pipe dream. The green revolution has its limits to growth, some of which are fossil-fuel related. Likewise, there is only so much cropland we can convert from food to fuel production before experiencing food deficits and starvation. At that point, parks and reserves look pretty enticing.

We all love the high concept of preserving species and ecosystems, but when our own well-being is at stake, humanity will put people first. To give biodiversity a fighting chance, ecologists and everyone else must focus attention on managing the population of our own species.



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