Uncle Dave Foreman's Around the Campfire

"The Human Population Explosion and the Future of Life"

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Shortly after the end of World War Two, visionary conservationists and scientists such as Fairfield Osborn began to warn that continued human population growth would cause all kinds of problems including heightened plundering of wild Nature. It was not until the late 1960s, however, that population growth moved to the front burner of the conservation stove as shown by the Sierra Club's publication of a book called *The Population Bomb* by a young biologist named Paul Ehrlich. During the next decade those who were worried studied, wrote, and warned about human population growth and its consequences.

Ehrlich and physicist John Holdren (currently in the highly prestigious position of president of the American Association for the Advancement of Science) suggested a formula for understanding the consequences of human

growth: I=PAT. This formula, once recognizable but now widely forgotten, means that human impact is a production of population, affluence (consumption), and some measure of technology. At the time, P (population size) was seen as the underlying and key factor for determining the magnitude of human impact. During the last two decades, however, it has become fashionable to discount P and stress A (affluence or consumption).

The level of consumption is a key multiplier of population's impact and individuals worldwide have vastly different levels of consumption of goods and services. Nevertheless, some "environmentalists" and social engineers (right and left) now argue that population size or even continued growth is relatively unimportant; they say it is the level of consumption of certain groups that is key for calculating how much damage an individual or population causes. Such activists argue that reducing consumption is much more important than stabilizing population. Others of us still see population as the big rock. Consumption vs. population may be an intractable debate since it is grounded in worldview as much as in evidence. In general, those who are biologically (or scientifically) oriented are more likely to see population as paramount in I=PAT, while those socially and economically directed tend to stress consumption. I would argue that biologists deal with a more fundamental and real world than do culturalists.

Let me offer just two examples to show how total population is the key. China's remarkable and frightening economic explosion in the last few years has now thrust it into the lead of nations cranking out greenhouse gases. However, were it not for the draconian population policies of China since the 1960s, the population of China would be closer to two billion instead of a billion and a half. How much more greenhouse pollution would China be pumping out had it not taken extreme measures to reduce the birth rate?

Had the United States instituted reasonable immigration policies in the 1960s before immigration became such a volatile issue, our population would likely have stabilized around 250 million. Because we didn't deal wisely with immigration, our population is now over 300 million and rapidly headed toward 400 million. How much less sprawl, greenhouse gas production, resource consumption, etc. would the U.S. boast today, had we stabilized our population then?

We can sort out the kinds of impacts population growth or PAT cause into five stacks:

Land degradation

Resource depletion

Famine

Social, political disruption

Ecological/Evolutionary wounds

Overall, discussion about the problems of population growth has looked at the first four sets. As a conservationist and Nature lover, however, I believe the impact of the population explosion on the rest of Nature is paramount. I also agree with Virginia Tech Professor Eileen Crist that population stabilization and resource depletion activists have made a strategic error by focusing on the first four. As she points out, we cannot predict when we will run out of a resource such as oil or when famine will strike. Indeed, attempting to do so has harmed our credibility. On the other hand, we can accurately and strikingly show how the spread and population growth of humans is harming Nature.

In *Rewilding North America,* I sorted out how humans harm Nature into Seven Ecological Wounds: direct killing, habitat loss and modification, habitat fragmentation, exotic species invasion, loss and disruption of ecological and evolutionary processes, biocide pollution, and the greenhouse gas effect. These different wounds are cumulative and synergistic.

Taken simplistically, the I=PAT equation lumps together the impacts of all kinds of people. This is how we get comparisons such as the one claiming that one typical American causes thirty-five times the impact of

one typical Bangladeshi. To more accurately understand ecological wounds, though, we need to shake out how global and local populations have differing effects. For example, an average American is responsible for much more greenhouse gas production, but a poor Bangladeshi farmer may be much more dangerous to the survival of tigers. Someone with a million-dollar starter castle certainly consumes more than someone living in an old shack on a national forest inholding. But the relatively poorer rural dweller might contribute more to the extinction of the Mexican wolf in the wild. So, we need to look at both I_G=PAT and I_L=PAT.

Seventy years ago, Aldo Leopold saw the protection of rare species as the most important task of conservation. Since the mid-1970s, we've known that mass extinction caused by humans is the leading problem, conservation or otherwise, facing us. In addition to wiping out many of our fellow Earthlings, mass extinction destroys raw material for evolution and disrupts evolutionary processes. Therefore the shocking, explosive growth of human population has not just short-term but also very long-term catastrophic consequences. Indeed, should the vast, sprawling human population break off major limbs of the tree of life instead of just plucking twigs and leaves, our impact will last forever in terms of Earthly life.

If we are to bring back population stabilization as a bedrock goal of conservation, I think it is essential to show how high human populations and continued growth cause and exacerbate the Seven Ecological Wounds. What I sketch here is just a beginning, only a few examples of what conservationists need to document on how the human population explosion drives the biodiversity crisis. For each of the wounds, I'll give an example of how both global and local populations drive them. (It can be more complicated when global and local people work together to cause wounds, but I will save that issue for a latter time.)

Direct Killing

I remember how as a kid I read the *Weekly Reader* telling us how better exploitation of the oceans would feed growing populations. Well, we did that. The consequences are collapsing fisheries around the world, die-off of coral reefs, and the functional extinction of once abundant and/or highly interactive species such as cod, sharks, and tuna. As hungry rural populations swell and spread, they vacuum the rainforest and other semi-wild ecosystems of larger animals for food. Experienced tropical researchers have told how even a small village with primitive technology can clean out the larger animals in a nearby protected area. As their

population grows, hunters go ever farther afield with snares, nets, and old guns.

Habitat Destruction and Modification

Other factors, such as lust for larger homes and moving to the Sunbelt, grow the cancerous sprawl of suburban and exurban bedroom communities in the United States. But the absolute growth of numbers of Americans also contributes to the destruction of wildlife habitat by new home developments. In the United States, immigration plays the big role in increasing our population. Even if people come here poor, their goal is to increase their standard of living—which they do, thereby consuming more than had they stayed home. Regardless of overconsumption, if the U.S. had fifty or sixty million fewer residents, there would be fewer home developments in the California coastal chaparral, the Sonoran Desert around Phoenix, woods and forests surrounding Atlanta, and so on.

In India, rapid growth of very poor peasants and tribal peoples is putting irresistible pressure on tiger reserves. Plans are afoot to allow people to move into once-well-protected areas that provide the last secure habitat for tigers and other species. Indian conservationists predict that tigers will vanish where this is allowed to happen.

Fragmentation

No matter if it is starter-castle suburbs and wide freeways in the United States or new slash-and-burn crop patches and logging roads in poorer countries, humans create barriers and fracture zones in wildlife habitats that isolate animal and plant populations into smaller and smaller areas and that will prevent migration north (south below the equator) or to higher elevations with radical climate change. Increased numbers of people are a key cause of our spread into once unpopulated or lightly populated regions where wild critters could range as widely as they needed before the human invasion.

Ecological/Evolutionary Processes

High population densities and the further spread of humans lead to disruption of vital ecological and evolutionary processes, such as wildfire, river flooding and drying, predation, and pollination. Growing numbers of people crowd fertile river bottoms creating pressure for upstream flood-control dams, which, of course, stop normal hydrological processes. In the United States and Canada, the spread of homes to forested areas leads to suppression of naturally occurring wildfires, which harms forest health and creates conditions for larger, unnatural, uncontrollable conflagrations in the future. Humans, whether Denver suburbanites or Indian peasants are

intolerant of big cats, wolves, and other carnivores, leading to their extermination and the loss of essential top-down regulation of prey species.

Exotic Species

The spread of people spreads invasive species. Increased global trade between growing (in numbers and affluence) populations spreads invasive species. The impacts people have on the ground when they move into a new area create the conditions most beneficial for invasive, exotic, weedy species that outcompete native species. Among the most destructive organisms spread by growing populations are plant diseases, which play absolute havoc with native plants and forests.

Biocide Pollution

People use biocides and cause pollution. On a global scale, wealthy populations cause much more pollution than do poor populations. But locally, all people produce pollution of varying kinds and growing population density leads inevitably to more local pollution, which acts as biocides to many species.

Greenhouse Gases

It can be hard to tell what the limiting resource will be when a population of any species grows to approach a point of overshooting the carrying capacity of its habitat. Unlike other species and other communities

of humans before the industrial revolution, we are now a global species. The entire Earth is our habitat. For the global human community, the resource in most short supply has turned out to be the ability of the atmosphere and the seas to handle industrial farts of carbon dioxide and methane, among other gases. By industry, I do not just include factories, smelters, motor vehicles, and such, but also the industrial exploitation of forests and other lands. Wealthy people throughout the world share the greatest guilt for producing greenhouse gases, but poorer people with their fires in forests, grasslands, and woodlands also contribute.

Here affluence (A) and technology (T) play large roles in how much impact individuals may have. However, the influence of sheer numbers of people cannot be brushed aside on the greenhouse gas question. What drives the clearing and burning of the Amazon? Too many people and too high a rate of growth in Brazil, plus the burgeoning numbers of hungry people in the world who need food the "virgin lands" of Brazil supposedly can produce—resulting in a speedy increase in Brazil's greenhouse gas production and loss of forests that could continue to sequester carbon from the atmosphere and sea. China passed the United States as the number one greenhouse gas emitting country in the world because of its massive population charging after greater affluence and technology. But if China

had only half a billion people instead of close to a billion and a half, it would not have passed the U.S. If China's population growth had not been harshly curtailed, China would be producing much more greenhouse pollution and may have by this time already pushed past a deeply consequential tipping point. The one-child policy in China may be giving us a few more years to deal with the staggering greenhouse problem.

As I ponder what factors cause each of these wounds on global and local scales, I do not deny that affluence and technology play big parts. My point, however, is that we cannot allow that obvious reality to overshadow the probably even-greater role of high population numbers and population growth rates in driving ecological wounds, from direct killing of threatened species to production of carbon dioxide.

Should conservationists find the wisdom and courage to come back to calling for population stabilization, we must stress how the population explosion causes the ecological wounds that result in mass extinction and destruction of the biosphere. There is our expert province. Because species extinction and destruction of wilderness has consistently been overshadowed by the other consequences of the population explosion, pointing this out as a

new concern in a thoughtful, convincing way could help return the world community to a more rational approach about population growth.

The examples for each wound I've cited above are just sketches and I welcome other examples, including very specific ones that show how population density and population growth drive each of the Seven Ecological Wounds. Examples involving both global and local people, as I've dubbed them here, would be useful. I'd also like to hear from those readers who are interested in working on this conservation issue.

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