

How Much Space on Earth Should be Allocated to the Biospheric Life Support System?*

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I believe wolves need to be eliminated.

Rex Rammell, Republican Candidate for Governor of Idaho
(as quoted in Egan 2009)

Since *Homo sapiens* appeared on Earth approximately 160,000 years ago, the species has gradually encroached on the space and resources that were originally the domain of the biospheric life support system. Only a few spaces are left on Earth that are not significantly affected by humans in some way. Despite persistent stories of a mutualistic relationship of humans and natural systems, humankind has always been a rogue genus. For example, humans were responsible for the extinctions of the late Pleistocene megafauna, even though humans had only primitive weapons and tools. When humans acquired fossil fuel energy and developed better tools and technology, they became a global geophysical force now termed the Anthropocene, which began about 1800. Evidence is widespread of the vast damage done to the biospheric life support system (Steffen et al. 2007).

Humans Are Still Taking Space from Wild Creatures

Most people have never heard of the biospheric life support system, although their lives depend upon it. Many of the "wild" places on Earth are now markedly different than they once were. Block (2009) laments the encroachment of humans into coyote territory:

A neighbor, fed up and sleep deprived, appeared one night at our front door with a lantern and a shotgun, asking my dad to hold the light while he fired. My dad – an urban Jew of Eastern European descent – knew a thing or two about displacement and assured the man that the coyotes, starved of their resources and their freedoms, would soon leave on their own. June proved my dad right; the howling finally ceased. The city, confident that the residents and Shih Tzus of Glenhollow Estates had nothing to fear, built a concrete walking path that wound along the creek.

The wild creatures had lost their space. Wild places are ever diminishing ecosystems that are usually quite isolated from each other. Diminishing them further by building shopping malls, "big box" stores, and housing developments is suicidal.

The Oceanic Biospheric Component

The oceans occupy about 70% of Earth's surface and are a key component of the biosphere. No robust information has been gathered on the relative activity of the land and the ocean components of the biosphere, but the oceans have been a major sink for carbon dioxide and are now less so. This situation alone justifies serious concern. At present, another major issue needs attention – a huge mass of waste plastic is floating in the North Pacific between Hawaii and Japan. This garbage patch is estimated to contain 100 million tons of plastic debris and is twice the size of the US state of Texas. The physical damage to marine creatures is already known and serious, e.g., turtles and seals have been trapped in pieces of plastic. However, a possibly more serious danger has become known – the plastic breaks down more rapidly than expected and releases contaminants (Editorial 2009). More evidence is needed to document these risks fully, but adding to the oceanic contaminant load is not prudent.

Two Possible Scenarios

Scenario #1 – (1) Humankind pushes the present biospheric life support system beyond its tipping point, (2) it loses more biodiversity, (3) goes into disequilibrium, and (4) the surviving species build a new biospheric life support system.

The new biospheric life support system will not likely produce conditions as favorable to humans as the present system. Consequently, the population will diminish to fit the carrying capacity for humans (if any) of the new system. Once a tipping point is passed, the situation is irreversible. Unfortunately, the tipping point is not known until it has been crossed. Species are becoming extinct, possibly at 1,000 times the normal rate, but the human population is still growing exponentially; resources per capita are markedly diminished; the era of cheap oil is over; and climate change is having adverse effects on agricultural productivity.

Scenario #2 – (1) Humankind systematically returns space to wildlife – not space for which humans have no use but space suitable for wildlife and (2) nurtures the biospheric life support system as its highest priority.

Economic growth has badly damaged the biospheric life support system, so economic growth in its present form is a threat to the integrity of the biospheric life support system. Nothing should be discharged into the atmosphere that is beyond Earth's assimilative capacity – a good start would be the marked reduction of carbon dioxide and other greenhouse gases emissions and, next, chemical substances that are endocrine disruptors. Even at present, Earth's assimilative capacity for these discharges may be zero. The human population must be reduced to fit Earth's carrying capacity. Ecological overshoots (deficits) must cease now.

These changes require an unprecedented adjustment in human behavior. "Business as usual" is no longer possible if the biospheric life support system is to be maintained in its present form. The already lost species cannot be replaced, but species that remain could be given a change to achieve optimal function. To assume that a replacement biospheric life support system, if one develops, would provide equally suitable conditions for humans is delusional! The only choice is preserving the present biospheric life support system.

Conclusions

The general public and its political representatives have not grasped the unique nature of tipping points. Reaching a tipping point is basically incremental – take more on a regular basis, and, if nothing happens, take even more. A good metaphor for a tipping point is walking toward a cliff on a pitch black night without a flashlight – take a tentative step forward and nothing happens – take another step and nothing happens – the third step is the catastrophic step off the cliff. The point at which the biospheric life support system will go into equilibrium is unknown. However, it will eventually collapse, and, over evolutionary time, a different biospheric life support system will be produced. This different system may support life, but probably not the life forms with which humankind currently shares the planet.

A prudent course of action would be to nurture the present system in hopes of its continuing to nurture humankind. Human nurturing should include allocating more space for the biospheric life support system over the entire planet. Eliminating toxic stressors and ecological overshoot is also a prudent step. Life support for humankind should be the primary goal of human society – not using natural systems to fuel economic growth.

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