Why 10% Conservation Goals are Not Enough

Two-thirds of South America's rainforests lie in Brazil. Yet, as recently as 2002, "only three to five percent" of Brazil's forest cover was set aside as fully-protected reserves. As some writers report, however, the Brazilian government has recently established an ultimate goal of fully protecting 10% (Wilson, 2002). While this more robust goal is to be applauded, Wilson promptly adds that "ten percent is not enough to save the Amazon as we know it" (ibid).

Although some development plans envision 10% as sufficient to save half the species present (we should not be at all cavalier in writing off 50% of the species in what may be earth's richest biome, of course), in fact, it seems most unlikely that such a percentage would preserve the existing climatic services and global functioning of the tropical systems.

Somewhere during the 90% eradication that current policy envisions and may allow, a catastrophic threshold or tipping point (with global repercussions) will almost certainly be crossed.

Furthermore, "…removal of 90% of the habitat allows about half of the species to hang on [but] removal of the final 10% can wipe out the remaining half in one stroke" (ibid), so that, with all the remaining populations in a single "basket," the survivors are at risk of extinction arising from natural disasters and occasional stochastic events such as fires, hurricanes, outbursts of poaching, temporary but massive human immigration resulting from war, famine, or natural disaster, failed governance, extended drought, and/or logging concessions, etc. One reasonable starting suggestion might be, as Wilson notes, to allocate about half for humanity and "half for the rest of life" (ibid).

Why Contemplated 10% Conservation Goals Are Not Enough

The objective of conserving earth's species, biodiversity, and the genetic and pharmaceutical libraries that they contain must be achieved. But conserving species does not necessarily conserve function. If Brazil, for example, "saves" only ten percent of its rainforests, will the remnant forest still generate the region's rain each day? And sequester the world's carbon? And generate an equilibrial supply of molecular oxygen? Will it still continue to function as "the lungs of the world?"

Or will disappearance of ninety percent of the forest spell the end of its role as a functioning system, so that even the remaining ten percent gradually deteriorates and collapses?

Suppose that we take samples of the cells, tissues, and molecules in a human body and store them. And by so doing, we successfully manage to conserve representative tissue samples of endocrine, bone, blood, heart, muscle, brain, connective tissue, and kidneys.

Saving tiny samples of each of these tissues offers no assurance that the organism itself will continue to function.

It is not an exact analogy, of course, but think again of the moist tropical forests functioning as the "lungs of the world." <u>If we were to save 10% of a person's lung tissues and destroy the remaining 90%, could we reasonably expect the person to even survive</u>, much less to continue to function normally?

Why should we suppose that earth's natural systems and environmental machinery are invulnerable?

Is saving one lung and one kidney enough? One lung would amount to 50% and one kidney is 50%. Is that sufficient to maintain even a suboptimal level of physiological function? Or does a 50% loss of each system constitute a new and highly precarious condition? Is it sufficient if we save some of the endocrine glands? If a person loses one lung and one kidney and half of their endocrine glands, what happens to their overall prognosis?

We probably need to save at least fifty percent of earth's natural systems - and, to the extent that the above analogies hold, <u>that fifty percent may not be enough</u>.

Emergency Room Conservation

Affordable conservation measures that can be accomplished quickly have been suggested by Norman Myers, et al. (2000): "We could go far towards safe-guarding the hotspots and thus a large proportion of all species at risk for an average of twenty million dollars per hotspot per year...or $500 million annually." Such "emergency room" conservation measures can and should be taken quickly, but there are assorted long-term measures that we should enact as well.

Writing in the journal <u>Science</u> (1999), Alexander James and his colleagues analyzed costs for near-term conservation initiatives. "We estimate that to buy and manage a broadly representative system of nature reserves covering nearly 15%* of the global land area (10% strictly protected) would cost roughly $16.6 billion per year on top of the $6.0 billion currently spent..." [so that] the "conservation of an ecologically representative global network of protected areas would cost only $27.5 billion per year."

*This James, et al. percentage almost certainly needs to be far larger.

Given recent U.S. expenditures of more than one trillion dollars to "rescue" banks, insurance companies, and the financial sector, the James estimate of a worldwide shared cost of about $27 billion must be viewed as extraordinarily modest.

Minimum Critical Size of Ecosystems

Perhaps the foremost challenge facing nature and natural systems today is the continuing destruction, fragmentation, and degradation of the natural habitats that still remain. But how large must reserves, parks and wilderness islands be in order to function as self-perpetuating nature reserves?

In their classic study of island biogeography, E.O. Wilson and Robert MacArthur demonstrated that large oceanic islands support more species than smaller ones (1967). In all biomes and habitats, including logging concessions and the world's oceans and seas, inviolate reserves and set-asides are increasing necessities.

Such principles of island biogeography are important aspects of conservation biology because the world's nature reserves and parks are quickly becoming "islands" in a sea of humanity.

And the bad news is that too many of our parks and reserves are, biologically speaking, too small. As Michael Soule writes (1985), "the species extinction rate is generally higher in small sites" and even the largest nature reserves and national parks "...are usually too small to contain viable populations of large carnivores."

Thomas Lovejoy and his colleagues designed an early project to help quantify "the minimum critical size of ecosystems." In their study, the team tracked species diversity and environmental conditions in a set of rainforest "islands" left as rem-nants in an area where virgin Amazon forest had been clearcut and removed (Lovejoy, 1986). This long-running project showed, among other things, that fragments smaller than one km^2 lose 50% of their bird species in less than 15 years, and that to slow the rate of species loss tenfold, a fragment must be 1000 times larger (Ferraz, et al., 2003).

The point is this: It is not enough to preserve a park of three acres or to establish a dozen or one hundred such parks. To conserve endangered species and func-tioning systems, reserves must be large enough to be perpetually self-sustaining. In addition, each should include large roadless areas that are bounded and buffer-ed by low intensity woodlands, forests, and national parks. In Central America, Costa Rica is famous for its series of megareserves with their protected and undisturbed core areas. While no economic activity is allowed in these core areas, they are protected and buffered by adjacent regions that permit limited nondestructive activities.

A continuation of today's demographic tidal wave may
constitute the greatest single risk that our species has ever undertaken.

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