The Evolutionary Biology of National Parks

In an effort to promote the growth and restoration of a user-friendly national park in Costa Rica's tropical dry forest, I have frequently been confronted with the question of whether to call it a biosphere reserve, instead of a national park. Such a change in name would appear to avoid the traditional conflicts between national parks and development, between conservative bureaucrats and avant-garde conservationists, between commercial people and conserved wildlands. After all, just as in the optimal biosphere reserve, the managers of this growing Costa Rican national park will live in it and even practice some internal small-scale farming and ranching; large areas of the park will be manipulated for forest regeneration and research; tourist and educational use will strongly perturb some areas; seed and animal stock may be harvested from the park for other habitat restoration projects; more than 80% of the habitats do not even approximate the pristine state and will take thousands of years to be fully restored; livestock will be used within as management tools, etc.

However, there is more to such a name change than meets the eye. Each tropical national park must evolve an intense park-specific interaction with the intellectual and material demands of its surrounding community, or it is dead. If we bypass extant national parks and invent comfortably functioning biosphere reserves on other sites, the many established national parks are inclined to say, "biosphere reserves are all well and good, and we wish you well, but what is happening in your biosphere reserve is management, and over here in our national park we will continue to maintain ourselves as a unique and pristine biological portrait, with fences and armed guards to keep out the ragtag enemy (and to control it when we let it in)."

On the other hand, if a given national park within a tropical country's national park system takes it upon itself to begin to evolve in an interactive and collaborative direction with its surrounding society, the remainder of the parks and the central park administration cannot just sit back and calmly twiddle their thumbs. The evolving national park immediately runs bluntly into legislation and government traditions about park use that almost appear to be deliberately designed to *prevent* the evolution of a user-friendly park. Once a legislation, tradition, and administrative structure has been evolved to service the evolving park, the process of a similar evolution for the other parks, and for the central administration

that coordinates them, is at once both demanded and considerably eased. In the words of politics, the evolving national park is being constructively subversive, and in the words of evolutionary biology it is being a partner to introgression.

There are additional reasons for causing a natural park to evolve rather than turn into a biosphere reserve. First, hundreds of national parks already exist; they are established to varying degrees in the public and legislative minds of many tropical countries. On the one hand, these national parks are still subject to substantial assault and living in a seige mentality — if indeed the challengers even notice their legal presence. On the other hand, these parks also enjoy substantial protection. By giving these parks the new name of "biosphere reserve" as they evolve, the administration runs the risk of abandoning a significant part of the substantial body of social approval already accumulated in the public and governmental mind for any entity called a national park.

Second, it is incontestable that national parks, biosphere reserves, or whatever they are called, must invent mechanisms for administrative and conceptual evolution as new challenges and opportunities arise. Any conserved wildland is a social unit that must react to a constantly changing social, conceptual, and factual network; this is especially true in the developing countries, almost all of which are in the painful and tumultuous process of conversion from frontier states to steady state equilibria. In this sense, a national park is analogous to a large research hospital or university, as well as to a museum and library.

We simply cannot afford to have two species of wildlands conserved for their biodiversity — one being static national parks and the other socially dynamic biosphere reserves. The evolution of national parks can occur through introgression and gradual accumulation of directed mutations, or it can occur through the brutal culling of those locked into a label. The population density of tropical national parks is not high enough to make the latter mechanism attractive.

To view the current parks as pristine and untouchable while we hurriedly develop other new areas that are called biosphere reserves is to automatically consign some of the finest remaining tropical habitats to the category "ancient castle under seige, walls crumbling, spies within." Those concerned with biosphere reserve theory have thought much about the mechanisms for the evolution of user-friendly wildlands that simultaneously conserve natural areas to various degrees, but working examples can be counted on the fingers of one hand. We have many examples of tropical national parks; however, tropical national parks are very weak in the theory and practice of the evolution of user-friendliness. A marriage of convenience and necessity seems very much in order.

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