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GARDENIFICATION OF WILDLAND NATURE AND THE HUMAN FOOTPRINT*

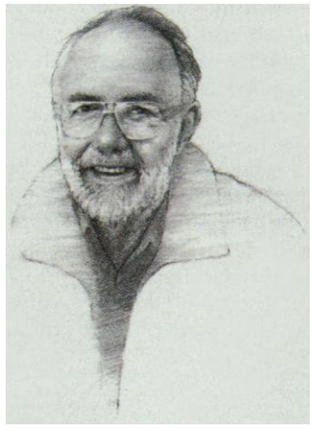

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ILLUSTRATION: ALLAN M. BURCH

My genes look out at an ancient landscape. They see me as a member of a small human tribe living in, and living off, nature. My genes think that all other tribes are full of robbers and thieves. They know that what happened last year and this year will happen next year. Part of the time I control what is around me, part of the time I get out of the way. My genes also know that my inclusive fitness is maximized by supporting those tribal policies that give long-term survival and health to their tribe in the nearby environment. They know that my inclusive fitness is maximized by intensely studying that environment. And my genes' study of the nearby environment says that if we cannot figure out how to hide a package as large as 235,000 wild species in the human genome, my inclusive fitness—my tribe's future—will be very severely impacted. I am a beast born of interaction with environmental complexity, and to strip me of that complexity is to render me colorblind, deaf, and tasteless.

Why such a big package? Because that is the order of magnitude of the blocks of continental wildland biodiversity and their ecosystems that are sustainable and self-replicable—large, complex, and interacting, not something that can be held in a zoo, gene bank, or ark. Each of those is a small garden behind the house—small, close by, useful, but limited in scope and duration.

Why can't the wild tropical species be left "out in the wild" to fend for themselves? Because the wild is at humanity's mercy. Humanity now owns life on Earth. It plans the world, albeit with an unintended here and an uninformed there. Until the Pleistocene, not more than a few thousandths of 1 percent of the Earth's surface was ours. Today it all is. If we place those species anywhere other than in a human safe zone, they will continue in their downward spiral as grist in the human mill, just as they have for the past 10,000 years.

But placed where in the human genome? The genome of each *Homo sapiens* is focused on its inclusive fitness, or roughly put, self-reproduction. Self-reproduction is largely sex, shelter, and feeding. These three processes drive and shape human society, and all its consequences, over all the Earth. To survive, a non-human species must be too diffuse to be thoroughly captured, too trivial to be noticed, or too immutable to be changed. Or, it can be woven into humanity's inclusive fitness. My lawyer's advice to wildland nature: If you can't beat 'em, join 'em.

Where can we place a large block of wildland nature among sex, shelter, and food, such that it is not a pebble in society's shoe?

Can we blend several hundred thousand species of wild organisms into human sexuality? I doubt it. Wild biodiversity and ecosystem services do offer theater and props to human courtship—flowers, perfumes, vistas, bird songs, and wild strawberries—but sexuality can absorb only a tiny, idiosyncratic, and symbolic subset of wildland biodiversity.

Shelter is much of the reason why the world's biodiversity is in deep trouble. Humanity and its domesticates—those ever-present extensions of the human genome—are genetically and culturally antagonistic to most wild biodiversity. It is part of the "enemy" and always will be. "Shelter" is largely shelter from the wild—be it monkeypox and rice borers, lions and wolves, or forest that shades pasture grasses and bean plants. I cannot imagine how to hide or integrate a hundred thousand species of wild organisms, and all the things that they do to and with each other, in someone's roof or in the Integrated Pest Control of an orange orchard. My goal is coexistence with wild nature, not its exclusion unto extinction.

The acquisition of sustenance—feeding—appears to be the only hopeful refuge for wildland biodiversity. At first glance this seems an unlikely route. We are hunters and gatherers. We eat wild biodiversity, and we do all we can to help our chromosomal extensions eat that which we cannot eat. A bean plant is a green machine that grows directly out of our chromosomes, sitting where wild biodiversity once was, another mouth for sun and minerals.

However, gardens are forever. Gardens are mushrooms on horse manure and cats under the kitchen table. Gardens are beehives and cows, and 16 varieties of rice growing in one rainforest clearing. Gardens are hydroponic tomatoes and vats of whisky-spewing yeast. Kids do it, agroindustry does it, grandparents do it, astronauts do it, and Pleistocene Rhinelanders did it. And we will all still be doing it 10,000 years from now. The garden is a somewhat unruly extension of the human genome.

So, how do we hide 235,000 species in the garden? By recognizing and relabeling wildland nature as a garden per se, having nearly all the traits that we have long bestowed on a garden—care, planning, investment, zoning, insurance, fine-tuning, research, and premeditated harvest. And this leads to the question of absorption of humanity's omnipresent footprints.

Part of the problem is in the name. Stop labeling the wild as the wild. There are simply many varieties of gardens. There is no footprint-free world. Every block of the world's wildlands is already severely impacted. Not only are they internally impacted through macroevents such as the megafaunal extinctions and selective extraction of old-growth timber, but the very frameworks of their existence—global warming, acid

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rain, drained wetlands, green revolutions, wildland shrinkage, introduced pests, and many more—are set by *Homo sapiens*. The question is not whether we must manage nature, but rather how shall we manage it—by accident, haphazardly, or with the calculated goal of its survival forever?

If we label conservable wildlands with what feels good and normal to our genes, maybe they will have some chance of survival. Then maybe we can feel good and open about applying what we know to them. Maybe then we can feel that they are valuable to humanity even if they do not provide someone's particular paycheck. Let's stop talking about national parks, wildlife refuges, drug gardens, conserved wildlands, biological reserves, protected areas, royal hunting reserves, national monuments, and all the other obfuscating labels that have been applied. Let's call them all what they are, wildland gardens.

What does the wildland garden grow? It grows wilds. Truth in labeling. It grows ecosystem services, and it grows biodiversity services. Multicropping, multitasking, and multiusing are key verbs. We have tens of thousands of years' experience of fine-tuning the urban landscape and the agroscape. But we are still in kindergarten in developing the wildland garden for contemporary society. The more quickly we can move the remaining large lumps of wild biodiversity into garden status, the greater the chance that they will still be with us into perpetuity. This means planning rather than evolution. We cannot afford the luxury of having the wildland garden come about through the selective survival of the few currently conserved wildlands that serendipitously attain garden status.

If the footprints are not absorbed, even the most well-meaning users will destroy the garden. And if those who leave footprints are excluded, our wildlands will not be gardens. Absorbing the footprints means, as a general rule, giving up on 5% of wild biodiversity and ecosystems for the indefinite survival of the 95% remaining. That is the price of being fitted into the human genome. There is no free footprint in the wildland garden.

Restoration is key to sustainable gardening. Restoration is fencing, planting, fertilizing, tilling, and weeding the wildland garden: succession, bioremediation, reforestation, aforestation, fire control, proscribed burning, crowd control, biological control, reintroduction, mitigation, and much more. The question is not so much "how," but rather "when," "where," "how fast," "by whom," "to what end," "how much," and who pays for it. In some cases, humans do the bulk of the work, and in other cases natural processes do—and the universal task is minimizing whatever has been impacting the wildland garden.

The basic principles of sustainability are time-honored. Protect the capital, plant it in the right sun, rotate the crop, eat part of the interest income, roll over the rest. Reduce the footprint's size, watch where you step, plow with the contour, and don't cash the savings bond under penalty.

How big a footprint can my garden absorb? Or, can I cut the forest down, convert the site's photosynthesis to hamburger for three centuries, and grow it back up again? Can I take out one tree trunk and store its carbon in a table that will serve 10 generations? Do I cut no trees but trample the forest understory with 2000 schoolchildren learning bioliteracy? There is a central difference between an agroscape and a wildland garden. A thousand hectares of agroscape has enormous latitude for disruptive change. Rice this year, cattle the year after, cotton for 2 years, and 50 years of tree plantation—then maize. The wildland garden needs to permanently remain a wildland garden, with the footprints being sustainably absorbed at many scales. One evolves and rotates the users more than the crops.

The wildland garden needs the same intensity of experiments and planning as has the agroscape, but hopefully with fewer failures. The wildland garden is still by and large being treated like gold in a box below the bed. Its care has consisted largely of buying a fiercer guard dog. What does the smart urban landscape do with its gold? It puts it to work in the marketplace. What does the smart agroscape do with its gold? It does the same thing.

The details of constructing any wildland garden—the application of concepts—are guided and frameworked by the details of the site, its ecology, and its society. Fire is a disaster here, essential there. Reintroduction is right here, wrong there. People can walk all over this, stay out of that. Sometimes a scalpel is called for, sometimes a bulldozer. What matters is the goal of wildland survival into perpetuity—the specific actions are place-based, time-based, society-based. Abandon the goal, and no protocol, convention, law, or regulation will succeed.

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Today's wildland gardeners have far more sophisticated tools than were available to the agroscape during its millennia of "development." The wildland gardener can access a huge body of global science about wild organisms (taxonomy, natural history, physiology, ecology, theory, evolutionary biology, community ecology, and so forth). And, we have a plethora of governance structures in which to embed the wildland garden.

But even with a strategy of "gardenification of nature" and explicit absorption of footprints, we are confronted by many genes and cultural traits that are quite comfortable with keeping wildlands in the "finders keepers" mode of ownership.

Science and humanity are largely incompatible. Science is based on the pursuit and distribution of truth, even if we make errors and miss that truth. Human society is heavily based on the selective pursuit and distribution of selected truths. In the agroscape and the urban landscape, the genes and the know-how are patented, bought, bartered, stolen, lost, hidden, and lied about. And—public domain or not—it will be the same in the wildland garden.

With the extension of the intellect through today's computerization comes the opportunity to do better basic science, but also to do more leakproof and more surgical withholding of knowledge. We have already done it with other body parts—cars, guns, oxygen tanks, electron microscopes, radios, medicine, eyeglasses, and satellites. We are headed into the hope and the threat of virtual reality. How will the balance play out with respect to the remaining tropical wildlands? Science and society are uneasy partners in the wildland garden: In the best of worlds we may achieve a very fine and finely negotiated partnership, and in the worst of worlds, annihilation of one by the other. A wildland garden with gentle trodding from caring gardeners just might achieve the partnership. A wilderness faces certain annihilation as a battlefield.

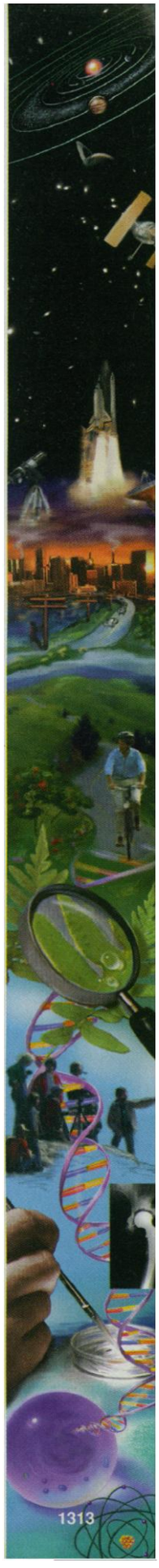

ILLUSTRATION: TERESE WINSLOW