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Good fences make good neighbors: the Area de Conservación Guanacaste, Costa Rica.

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ABSTRACT: The 153,000 ha Area de Conservación Guanacaste and World Heritage Site in northwestern Costa Rica is place-based restoration and conservation of a tropical dry forest ecosystem and its adjacent ecosystems through its integration with local, national and international society. Fifteen years and \$45 million have generated substantial progress down this path. There have been no new wheels to discover but success has required single-minded attention to the goal. The classical national park structure that gave us the raw biological materials to work with in 1986 requires substantial modification to survive in today's world of privatization, decentralization, global markets, and technical feasibility. Restoration is easy - stop the assault and let nature do its thing. Multi-faceted integration and self-sufficiency have required much more effort. Perhaps the largest impediments are that national society has a tendency to want to manipulate the conserved area to its own ends rather than let it be what it is meant to be, and international society continually changes the rules of the game and the structure of the playing field.

Introduction.

The Area de Conservación Guanacaste (ACG), in northwestern Costa Rica is place-based conservation of a tropical dry forest ecosystem. It is an attempt to learn by doing, the pragmatic, frontier approach. Here, I reflect on some of the trials and tribulations of the first 15 years of the ACG as ongoing construction of a tropical conserved wildland that is integrating with its local, national and international constituencies such that its biodiversity and ecosystems will survive into perpetuity.

A brief history.

Today's ACG is 110,000 ha of land and 43,000 ha of adjacent Pacific Ocean. It was born in 1966 as a tiny national monument, and then in 1971 became the 33,000 ha dry forest and marine Parque Nacional Santa Rosa, a key part of Costa Rica's new Servicio de Parques Nacionales (e.g., Boza and Mendoza 1981, Cornelius 1986, Wallace 1991). By 1985, the stresses of annual anthropogenic fires, poaching, small size, neighboring wars, centralized government, shrinking

budgets, national inflation, militaristic park guarding, and a host of more minor ills were already rapidly reducing its biodiversity conservation potential to not much more than that of a brushy dry forest cattle pasture around forest fragments in ravines.□

In the same year, my biologist wife Winnie Hallwachs and I had two experiences in conservation biology that converted us to volunteer biodiversity developers for this small national park.□First, Costa Rica's rainforest Parque Nacional Corcovado was invaded by 1,500 gold miners who felt socially legitimate because the place "had no owner", and the solution to their removal was found to be largely that of convincing them that indeed a national park did have an owner (Janzen et al 1985).□Second, the government of Australia asked us to offer ideas as to how make its enormous expanse of seemingly unoccupied tropical dry forest not be attractive to the land-hungry populations to the north.□And, in the field inspection, we found that they had also managed to burn the area so thoroughly that a fire disclimax wooded grassland appeared to be the natural state (Janzen 1986a, 1988a).□□

We returned to Santa Rosa and realized that we had never asked how does one stop the anthropogenic fires, let the forest restore, have the place be viewed as owned by society, and be large enough and developed enough to pay its own bills as well as be home to its biodiversity (Allen 1988, 2001, Janzen 1986b, 1987a, 1988b-c).□Once conservation had been posited in that form, rather than as "guarding", the newborn ACG became an exercise in biological and social engineering (Janzen 1988a-f, 1989a-d, 1990, 1991, 1992a-d, 1993, 1994a-b, 1995, 1996a, 1997a-c, 1998a-c, 1999a-b, 2000a-e, Janzen and Gamez 1997, Janzen and Hallwachs 1992, 1994, Janzen et al 1993a-b, Livernash 1998, Williams 1994).□First called the "Guanacaste National Park project (GNP), it was then decreed the Unidad Regional de Conservación Guanacaste (16 August 1989), and then the Area de Conservación Guanacaste (9 July 1991).□It became an amalgam of three national parks, two wildlife refuges, one forest reserve, one zona protectora, and the surrounding matrix of private land purchased for inclusion. It became a single biophysical unit -□all with one budget, one director, one staff, one local board of directors, and one goal (Janzen 2000a-d).

There have been no new wheels to discover in the ACG.□But there has been a great deal of borrowing of wheels from other carts, cars and airplanes, and leveling of roads on which they can run, and adjusting the loads they are expected to bear.□Axle grease and gasoline are resources always in short supply.□There are lots of quarrels about who gets to drive the bus, who gets to be a passenger, who changes the flat tires, and who gets to draw the road map.□But the bus continues to get there because it has one overriding destination - the conservation of the ACG wild biodiversity and ecosystems into perpetuity.

Status and biodiversity values of the ACG.

The ACG is a UNESCO World Heritage Site 90 km in length and 5-30 km wide crossing nine Holdridge Life Zones in its continuous transect from marine through Pacific coastal dry forest to cloud forest (1500-2000 m) to Atlantic rainforest in northwestern Costa Rica (<http://www.acguanacaste.ac.cr> and http://janzen.sas.upenn.edu/caterpillars/RR/rincon_rainforest.htm). It is spread across recent to ancient volcanic soils, recent marine deposits, and ancient serpentine. Its 235,000-plus species rival the biodiversity of the continental United States and Canada (Janzen 1996b). The ACG is a fine-scale mosaic of interdigitated ecosystems constituted of old-growth and 0-400-year-old secondary succession, all being allowed to restore themselves (by stopping the anthropogenic fires, hunting, farming and logging) to a conserved wildland that exists as a large island in a sea of agroscape. This geographic status is the unavoidable destiny of the ACG, no matter what kinds of "corredors" eventually appear between it and other large conserved wildlands. The ACG is the only large conserved wildland in the Neotropics that extends from the Pacific Ocean to the rainforest of the Atlantic coastal plain. The ACG is also restoring and conserving one entire dry forest ecosystem and its adjacent marine, cloud forest and rainforest complementary habitats (among which, thousands of species annually migrate, e.g., Janzen 1987b-c, 1988g, Hunt et al 1999).

The ACG is a decentralized portion of the Sistema Nacional de Areas de Conservación of the Ministerio del Ambiente y Energía (MINAE) of the government of Costa Rica. Its administration is an irregular and still adjusting government-private alliance conducted on land owned by the State but paying its own bills and guided by principles more common in the private sector than in state bureaucracies.

The entrance sign to the ACG says "Area de Conservación Guanacaste, fuente de vida y desarrollo". The key word is "development". While today this is the only "national park" in the tropical world with such a mission statement on its entrance, it is an easy prediction that others will find themselves seeking the same path (e.g., Janzen 1998a, 2000e). If the ACG is to biodevelop yet conserve itself, it must remain a lump that does not dissolve into the agroscape.

Local and other development threats, and root causes of biodiversity loss.

If tropical rainforests were as friendly to the farmer and rancher as are dry forests, there would be essentially no rainforest to try to conserve. The ACG dry forests, like tropical dry forests everywhere, have long been favored sites for pre-Colombian and European agriculture (Janzen 1986a,b). The simple root cause of biodiversity and ecosystem loss is ecosystem conversion (to agroscape), habitat reduction and fragmentation, species-specific harvest of desired animals and trees, and dry season free-running fires set both for management (maintain cleaner pastures) and indifference (who cares if the forest burns?).

The indigenous impact on ACG dry forest (and cloud forest and rainforest) was hunter-gatherer and light agriculture (light because its soils in general are among the worst in Costa Rica). Beginning in the late 1500's, the ACG dry forest became a low-yield livestock ranch, site of timber harvest, lightly hunted, and semi-annually burned (to open and maintain pastures free of forest re-invasion). However, it was never sufficiently profitable to have been thoroughly cleaned of its biodiversity.

Because of this low agricultural value, and a variety of historical, sociological, and other biological reasons, in 1985 the ACG dry forest area was chosen for ecosystem-level restoration through stopping the anthropogenic fires, eliminating (by land purchase and management) further farming, logging, ranching and hunting, and consolidating all the pieces into one large biophysical and administrative unit. Since there was no large Mesoamerican piece of dry forest to be conserved in its old-growth state, the decision was made to restore one. And, the decision was made for it to be large enough and user-friendly enough that it would be a welcome member of local, national and international society. If it had been a tiny jewel, as are so many national parks, every hectare of would have had to be nursed and protected as a national treasure. Because the ACG had never been a successful agri-ranching operation, because it is very large and biotopographically diverse, and because it is far from the national seat of power, the only species that were lost in its 400 years of European-style assault are those that are nationally extinct (e.g., giant anteater (*Myrmecophaga tridactyla*) or nearly so green macaw (*Ara ambigua*). Costa Rica lost its megafauna - except for the tapir, horse and jaguar - to hunters 9,500 years ago (Janzen and Martin 1982, Barlow 2001).

Beginning in 1985-1986, the threats were mostly handled by (1) raising the money to purchase the land to be restored on the open market (rather than attempt to take it forcibly), (2) extinguishing fires both in the ACG and before they arrived, (3) intensively reaching out to the community through on-site teaching basic biology in 4th, 5th and 6th grades for all 42 neighboring schools (2,500 students per year), (4) employing and managing locally, (5) establishing an endowment fund to meet annual operations costs, (6) inspiring and professionalizing staff to be accountable and responsible for their particular specialization, and (7) placing the overall policy of the ACG both under the control of a local board of directors who share power with the central government and its NGO, and, simultaneously, in the hands of the ACG staff. The entire operation has cost about \$45 million over 15 years to restore and conserve 2% of the country.

As the ACG became a consolidated administrative and biophysical entity - essentially a very large ranch among other large ranches and a smattering of small farm-ranches - the nature of the threats to it as a whole changed from "the little guy with a chain saw" to today's quite different society. During this 15-year period the

social and biological environment of northwestern Costa Rica, to say nothing of the world at large, also changed dramatically. Sociologically, the region is undergoing the same "flight to the cities", or urbanization, characteristic of much of the Neotropics occupied by European immigrants and their descendents. This is not only a geographic flight. Today's young adults have neither the inclination nor the technical ability to be a frontier farmer or hunter-gatherer. Equally important, the globalization of the beef industry (rendering it no longer viable on many of Costa Rica's young and old marginal pastures), and the tightening national legislation on the cutting of tropical hardwoods, has meant that land could be purchased relatively freely and cheaply for both rescue of remnant forest and restoration of any forest. In short, conversion of the ACG from low-grade agri-ranching to a hopeful beginning of wildland biodevelopment is widely viewed as good local and national policy, and fits well with current international trends as well.

Today's threats to the ACG are a combination of national and international. Internationally, we watch with apprehension the sweep and change of agricultural fashion and disease. Biotechnology can today design a crop for any square meter of land. A crop plant is merely a photosynthesis-driven machine, and we are fast losing "agricultural inviability" as the single greatest friend that conservation ever had (Janzen 1987d). If the European beef industry succumbs to "mad cow disease", what was our neighboring worthless trashy cattle pasture, in line for forest restoration, may abruptly become pricey real estate. If the Kyoto Protocols, or something like them, are not adopted internationally, the ACG, and Costa Rica as a whole, will lose a major opportunity to capitalize its forest restoration process, and hence have a weaker base for biodevelopment and direct biodiversity conservation. If the global orange juice market continues in its decline, the ACG will have weaker neighbors that are less able to purchase the ACG's environmental services (e.g., Livernash 1998, Janzen 2000a, Escofet 2000). As other tropical countries wiggle their societies into being ever more ecotourist-friendly, Costa Rica loses its comparative advantage and can no longer rely on bed-and-breakfast and a nice forest to bring in the tourist dollar. In other words, some of the enabling conditions for carrying out the "local" survival of the ACG through biodevelopment - employment, intellectual development, equal opportunity for women, market development for specific products, poverty alleviation, contribution to the GNP, national political acceptability, etc. - depend very heavily on actions in the international arena as well as the ACG's ability to respond to them.

A conservation area must survive in a national as well as a local arena. A biodeveloped conserved wildland may benefit neighboring communities sufficiently to be well received locally, yet be viewed as economically unattractive to centralized governments and societies. Moving the decision-making and spending process from a centralized government to a decentralized ACG automatically reduces political and economic resources for the very centralized government whose consciousness spawned the conservation area in the first place. The single

largest national-level threat to the construction, growth and biodevelopment of the ACG is the mass of traditions, legislation and income streams in the central government and centralized society, all of which are organized around keeping the income stream flowing to the central system.□No society has much interest in moving control of the source of production to that source of production.

A national government of a tropical tiny country - like Costa Rica - operates on a miniscule budget and a "GNP/person" that is about 10% of that of the "developed" world.□The annual operating budget of the government of Costa Rica is about the same size as that of a upper rank US university.□While it may be reasonable to expect a national government to be a minimal contributor to the initiation of conserved wildlands, it is unreasonable to expect them to also sustain the much greater costs of their long-term survival as resources for the globe as well as the country.□ However, for a conserved wildland like the ACG to become self-sustaining, both through development of its own endowment (= trust fund) and through non-damaging remunerative environmental services (ranging from ecotourism to carbon sequestration to biodegradation of agricultural waste), it must be allowed to do so rather than be viewed as a low-investment ward of the state that supports the central treasury.

The major national "threat" to the ACG is, then, not being allowed to be the ACG, and rather, be forced back into the traditional "national park protected by a guardaparque with a gun" model.□This model has (fortunately in many cases) given society the raw materials with which to conduct biodevelopment, but will not sustain those raw materials in the face of normal human avarice and simple desire for "more".□In other words, the establishment of a national park is the purchase of biodiversity existence value by the "conservation donor".□ However, if only purchased but not developed, it has no survival ability.□Buying a new car is only the first step in winning a car race.

Institutional arrangements, including local conservation agreements.

There were at least seven key founding institutional arrangements and local conservation agreements for the ACG.□□□First, the directors of the (then) existing Servicio de Parques Nacionales, Direccion General Forestal, Direccion General de Vida Silvestre, and government-controlled NGO (Fundacion de Parques Nacionales) agreed to relenquish their political/administrative power over personnel and land to the control of a single administration, budget and goal (restoration and conservation).□This 1986 far-reaching step broke ground also for today's Sistema Nacional de Areas de Conservacion (SINAC), which is the amalgamation of the three government agencies.□The ACG is today one of the eleven portions of SINAC.

Second, the decision was taken that what was to be conserved would be bought on the open market and deeded to the state (as classical "national park"), and that all

possible efforts would be made to leave the adjacent agroscape in peace as good neighbors.□This policy has been muddled by the central government's insistence that the ACG also take over enforcing various environmental regulations in the agroscape.

Third, the policy was adopted that all ACG staff would be trained for something specific (educators, fire control, administration, ecotourism, research, restoration, etc.), permanent, resident, largely trained "on-the-job", and Costa Rican, whether "local" or newly "immigrant" from other parts of Costa Rica.□Implicit in this policy is that essentially all of the \$1.7 million annual ACG budget is spent locally, and that the ACG is among the largest employers on the agroscape.□

Fourth, a local board of directors and assembly for the ACG was appointed by the ACG (and then it became self-replacing) and charged with the responsibility of approving annual budgets, work plans and the director.□This power is irregularly shared with the central Ministry of the Environment and Energy, a relationship that requires considerably more polishing.□□

Fifth, about 20% of the annual budget is directed to carrying out, on-site in the ACG, the biological education program in all neighboring schools.□The simple goal is to create a bioliterate community that also has had early and positive interactions with the ACG as a biophysical place and social institution.

Sixth, it was agreed that all costs of the ACG would be met through fund-raising, subsequent interest income from its endowment (generated by fund-raising), and payments for environmental goods and services.□The latter, the development of a diverse income portfolio for the ACG, has been slow to develop because of central government obstruction and possessiveness. However, the process is gradually moving forward.□The reality and the goal is that conservation of this 2% of the country will not cost the national budget anything, and that it will eventually contribute at least as much to the national economy as it would if converted to average agroscape.□However, it is assumed that were it to fail at the latter, it would remain a conserved wildland - and in that key way differs from traditional agroscape.

Seventh, it quickly became aparent that the highest quality conservation would be achieved through simply stopping the major threats (fire, hunting, logging) on land owned by the ACG, and expanding the size and ecosystem coverage of the ACG to include maximum size and diversity of habitats and ecosystems - in other words, leave nature to itself.□The task is not the application of "conservation biology" so much as to focus on the integration of this wild lump with neighboring, national and international society.□

The details of how this integration is being achieved are extremely place- and

circumstance-specific, as they will be with any conserved wildland. The ACG happens to have a major rice-growing area downstream from its major river coming from its clouds; this brings both the bounty of water charges in the future, and the ire of those charged. The ACG happens to have a major orange plantation on one boundary; this brings a market for the ACG's orange pulp biodegradation services, and attacks from those who feel a conserved wildland should be "pure" and do not understand (or want to understand) the forest restoration process (Livernash 1998, Janzen 2000a, Escofet 2000). The ACG happens to be in a society where all children go to school through sixth grade; this produces an excellent opportunity to introduce bioliteracy, though urbanization is rapidly taking the children away from nature's books. The ACG happens to be imbedded in an urbanizing European/Mediterranean immigrant community; love of forest living is not an obstacle to conservation, but neither is it a motor for conservation.

The ACG is being constructed when the world is moving from typewriters to the Internet, when there is too much carbon in the air, and when some fraction of the global community is getting ever more tired of its urban-agroscape and appreciates the existence of some remnants of what once was. In this socio-political climate the ACG institutional arrangement has to be proactive and opportunist, seeking markets for its environmental services, seeking the right and responsibility to take care of itself, and seeking whatever paths to survival it can find in an ever more anthropomorphized world.

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