

2012

Large and Small: Conserving Single Large and Several Small

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Recommended Citation

Abel, Troy D. 2012. Conserving single large and several small. In *Five Seasons in Ecotopia: Rainforest Immersion and Conservation Action in Costa Rica*, ed. Troy D. Abel. Bellingham, WA: Village Books Press, 12-15.

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LARGE AND SMALL

Conserving Single Large and Several Small

Written by Troy D. Abel

Huxley College of the Environment's field course on rainforest conservation traces some of its roots to a seminal 1967 publication. MacArthur and Wilson's *The Theory of Island Biogeography* presented two fundamental principles. Larger islands support more species than smaller ones and remote islands support fewer species than less remote ones. Moreover, they also established how habitat can be insulated by not only distance between islands, but anything that divides a landscape such as mountains and climate. But the conservation implications of biogeography became dichotomized during the seventies and eighties into a debate between preserving a Single Large section of habitat, or Several Small and captured in the acronym SLOSS? Costa Rica's preserved natural areas presented WWU students with an excellent case study of this history of conservation biogeography and its future where protected area management embraces Single Large AND Several Small (SLASS). Moreover, Costa Rica offered a stimulating laboratory to explore the promise and pitfalls of SLASS for students from around the world and its implications for ecosystem conservation challenges everywhere (Boza, Jukofsky, and Willie, 1995).

Preston (1962a, 1962b) first raised the concern that many nature preserves and parks were just too small to support many species. Later, Diamond (1975) connected these ideas and developed a set of design principles for the management of an ecologically sound park system. These included: (1) larger protected areas will hold more



Carara Island. Map credit Kathryn Mork

species than smaller ones; (2) a protected area closer to others will support more species than an isolated one; (3) a round park will hold more species than a long narrow area; and (4) corridors between conservation areas might mitigate the island problem. Another dichotomy that dominates biodiversity protection strategies around the



world is between “fortress conservation” (Brockington, 2002) or “fence-and-fine” policies with “democratic” or “participatory conservation” (Kubo and Supriyanto, 2010).

For environmental conservation, Garret Hardin’s seminal 1968 publication concluded that: “Freedom in a commons brings ruin to all” (Hardin, 1968, 1244). Moreover, his tragic analogy about farmers and their herds overgrazing a pasture has informed policy designs around the world and Hardin’s prescriptions are an even more powerful force in environmental management. One must regulate or privatize and the commons world was painted black and white (Wiens, 2007).

Our field course presumed that the SLOSS dichotomy is a false debate. It’s not single large and it’s not several small, but conservation requires the networking of both (Bennett, 2004). Our experiences have been more consistent with a rich literature suggesting that humans are not always trapped in the commons tragedy. Instead, a complicated web of resources, user, and institutional conditions can lead to successful Common Pool Resource (CPR) management. The 2009 Nobel Prize for the Economic Sciences was shared by the most influential scholar in this field.

Elinor Ostrom (1990, 1999, 2000, and 2009) has developed a scholarly strand that includes a focus on the ability of citizens to participate and influence resource management strategies. Ostrom and others would push the debate beyond just a dichotomous choice between markets or a hierarchical government. In particular, they began to illuminate a third path that was more plural, local, and potentially more civic. Two specific components of such a “civic environmentalism” include both the devolution of policy-making responsibility from the federal government to state and local jurisdictions and attempts to increase

the influence of citizens in environmental decisions (Abel and Stephan, 2000).

For example, a demand for more participation in environmental policy decision-making led to Costa Rica’s regionalization of conservation area management in the mid-nineties. In 1996, the national and centralized system was reorganized into regional offices in an effort to decentralize, deconcentrate, and democratize conservation management (Evans, 1999). The Sistema Nacional de Areas de Conservacion (SINAC), or National System of Conservation Areas, was established to move from a strategy of protection and preservation to one of sustainable development.

Thus, Costa Rica and its National Parks offer an excellent case study of the opportunities and challenges of democratic ecology and biodiversity conservation for WWU undergraduates and other students of the environment. More specifically, Carara National Park has been the center of a participatory Scarlet Macaw conservation program that combined research (Arce et al., 2010a; Meyers



Photo credit Troy D. Abel



Large and Small cont'd

and Vaughn 2004; Vauhan et al. 2003, 2005, and 2006), collaborative monitoring and conservation (Arce et al., 2010b; Vaughan et al., 2005), and environmental education (Mork et al., 2011 and Vaughan et al., 2003). Huxley College of the Environment's Rainforest Immersion and Conservation Action (RICA) program had three teaching objectives. First, we expected students to connect the global and local forces influencing ecosystem conservation in a developing country. Second, our fieldwork immersed students in an interdisciplinary experience that required them to navigate the democratic and scientific issues of protecting rainforests. Finally, the program emphasized service-learning to foster community-based ecological awareness and the civic responsibility needed to achieve global environmental sustainability. The first course, titled International Biodiversity Conservation, aimed to bridge traditional teaching schisms between environmental science and political science, or, between learning about nature and learning about civics. For instance, students learned about rainforest biodiversity and how its demand for technical expertise can impede the influence of Costa Rican communities in conservation decision-making.

In the second course on Environmental Peace, students learned how sustainability became an alternative to the preservation versus development dilemma faced by many developing countries. First articulated in the 1987 Brundtland report as "development that meets the needs of today without compromising the ability of future generations to meet their needs," this strategy became central to environmental thinking in the nineties. Conservation strategies aiming for a nexus of ecology, economy, and equity (E3) were the main subjects of several lectures during the students' field experience at two different national parks. The economics of this triple bottom line were also addressed primarily through discussing, observing, and journaling about the role of

ecotourism in Costa Rica's economy. Two days at the University of Peace campus in Costa Rica presented students with the sphere of equity issues. For instance, they contemplated how environmental conflicts can be driven by unequal and degraded natural resource conditions.

Students also engaged in the development of several participatory monitoring projects for their third Environmental Research Experience course. Conceived as "civic ecology," a growing body of work combines the development of scientific indicators of ecosystem integrity and volunteer participation in natural resources monitoring (Chopyak 2001; Fleming and Henkel 2004; Gasteyer and Flora et. al 2000; and Shultz and Saenz 1998). A key element of successful environmental monitoring is the development of cost-effective environmental indicators that provide scientifically defensible and reliable information about the status of resources.

Rainforest Immersion

On one August day in our RICA program, I was leading a small team of my students in a pre-dawn excursion to kick off the annual count of Scarlet Macaws (*Ara macao*), or Lapa Rojas. We woke before dawn in a quiet block of cabins and wound our way up the switch backed road between luxury resort homes and condominiums to one of the area's high hills. During the next three hours, we would watch the forest come alive from a vista above the mangroves, farm fields, and landscaped terraces. The town of Tarcoles was in front of us. The Nicoya gulf and Guanacaste Peninsula framed the horizon. A mix of forest fragments and housing developments stretched south. Behind us was Carara National Park, the ecological core of these biological and social communities. Like the tide coming in that morning, waves of life were emerging from the dark green hued canopy below us.



We were in the middle of a private, and foreign owned housing development with a westerly view of one of three flyways Carara's Scarlet Macaws used for their morning commute. After spending the night in the Guacalillio Mangrove Reserve, Macaws would spread across this region in search of food. But White Egrets flew first. They floated below us in small flocks traversing north and south. A pair of Black-bellied Whistling-Ducks fooled me as I squinted through my binoculars to sight the first Macaws. They were moving too fast I thought to myself. And they were quiet! The early darkness would not yet easily reveal the Lapa's reds, yellows, and blues.

The forest exhaled banks of wispy clouds that hovered in and over the trees. I inhaled the moist warm air of the morning. More light came. Then, the call of a Macaw pierced through the rhythmic wave sounds in the distance. It's mate squawked back. Their calls are as acoustically ugly as these birds are visually beautiful. The sound is hard to describe, but Barcott (2008) would put it this way. "The scarlet macaw sounds like one of nature's chain-smokers, their cry a throaty, blaring rrrra" (23). I struggled to focus on the still shadowy canopy with my binoculars and failed to find Macaws in flight. Dropping them for a few seconds to scan with my naked eyes, I realized how Costa Rica's rainforest provided a unique prism revealing our world in its many hues. In the morning light spreading across the jungle canvas, life began to explode before our eyes. It is only in this ecosystem that one fully understands biodiversity in climax.

Darwin ((quoted in Kircher 1999)) would observe that: "In tropical forests, when quietly walking along the shady pathways, and admiring each successive view . . . Epithet after epithet was found too weak to convey . . . the sensation of delights which the mind experiences . . . The land is one great wild, untidy, luxuriant hothouse, made by nature for herself" (21-22).

In that morning's view, I soon sighted the first pair of Macaws with my naked eyes. After a closer look through my lenses, "one pair!" (una pareja!) I shouted to our recorder. A student quickly confirmed the couple departing the mangroves for points south. The sighting was relayed by walkie talkie to the count's coordinator. Macaws kept taking wing. Two, no, three more pairs. Several triplets appeared; the hallmark of parents socializing their January or February newborns. Since Macaws are presumed to mate for life, any tight formation larger than a pair is considered a family (Vaughn et al. 1991). We saw a rare quartet, more pairs, and then, a sad solo. My mind scrambled for words to describe what the eyes were drinking in. This is nothing like the biological monotony of my home in the northwest where, like the thousands of seagulls monopolizing the skies of Bellingham Bay, a few species dominate. Instead, from this natural (and unnatural) balcony near Carara, I saw Pelicans, Vultures, waves of Parakeets, Great Blue Herons, a massive Wood Stork, Solitary Fly-catchers, and many more. Carara and its surrounding landscapes are home to more than 360 bird species—nearly as many as the entire state of Washington.

In mid-morning, we heard a falling tree groan to its death by the river and five Lapas went flitting to new perches. Our team recorded 86 macaws that morning but numbers, words and pictures could never do these sights and sounds justice. Only after having all your senses engaged by its flora and fauna will you begin to grasp the complexity of rainforest life. But the story doesn't stop at the boundaries of this or any other of Costa Rica's renowned system of conservation areas. Natural resource conservation begins inside protected natural areas but will be finished, for the good or the bad, outside of them.