

## **THE CULTURAL POLITICS OF SUSTAINING DIVERSITY**

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## **I. INTRODUCTION: Studying Cultural And Biological Diversity**

The need to understand the relationship between diverse human activities and the environment is considered to be a matter of urgency and a moral imperative by scholars from many disciplines (Chapin et al. 2000; Vitousek et al. 1997; Sala et al. 2000; Maffi 2001). In the biological sciences, researchers have chronicled the intense impacts of human activity on biodiversity, leading to “unnaturally rapid” extinction rates that are believed to be human-driven (Chapin et al. 2000:234). A growing body of interdisciplinary literature approaches human-environment interactions through the perspective of biocultural diversity, a relatively recent field of inquiry (Maffi 2005). While biodiversity is understood to encompass many scales—ecosystems, species, and genes—similarly cultural diversity is studied in many different contexts. Language, knowledge, and practice are three main approaches to cultural diversity. The definition and assessment of each component of cultural diversity presents practical and political challenges, while the incorporation of both biological and cultural diversity into conservation paradigms raises an even more complex debate.

Just as species are the most commonly assessed indicator for biodiversity, languages are commonly used as a proxy for cultural diversity (Maffi 2001). Studies have found correlations between areas of high biological and cultural diversity by comparing endemic species and languages (Harmon [1995] cited in Maffi 2005). Parallels have been drawn between language loss and species extinctions, using the *IUCN Red List Categories and Criteria* as a common indicator for assessing extinction risk (Sutherland 2003). Similar to the rhetoric of biodiversity loss, an extinction crisis of the world’s languages has been foretold.

A second major field of inquiry in biocultural diversity explores local, indigenous or traditional environmental knowledge and related practices (Maffi 2001; Ramstad et al. 2007). Many ethnobiological studies are carried out with the goal of identifying traditional uses of medicinal plants and other natural resources (e.g. Berlin et al. 1999). While many of these research programs are constructed with the goal of respecting intellectual property rights (IPR) and bringing mutual benefit to communities, bioprospecting and related IPR agreements have been criticized by anthropologists for being ineffective (Hayden 2003) and for doing “violence to indigenous meanings of nature, medicine, and property” (Nigh 2002:452). The loss of traditional knowledge and practices through acculturation—cultural erosion—has emerged as a growing concern in this literature, which seeks to document both the transmission of traditional knowledge and the interrelation of cultural and environmental change.

A fundamental tenet of much of ethnosience is that traditional ways of life are sustainable and traditional knowledge can contribute to scientific understanding of the modern world. Traditional knowledge is recognized in the *Convention on Biological Diversity* as an integral component to conservation (CBD 2007). As the *Convention on Biological Diversity* webpage states, “The international community has recognized the close and traditional dependence of many indigenous and local communities on biological resources...There is also a broad recognition of the contribution that traditional knowledge can make to both the conservation and the sustainable use of biological diversity, two fundamental objectives of the Convention.” Yet anthropological literature complicates this view, demonstrating that indigenous people do not always act to conserve their natural resources (e.g. Kayapó, in Conklin and Graham 1995). Krech has further critiqued the assumption of sustainable practices in American Indians, questioning the modern view of the “Ecological Indian” (1999). Furthermore,

scientists' concerns for the loss of traditional knowledge can elicit suspicions of protectionism, reminiscent of the ecological imperialism debate—who are western scientists to advocate conservation of biological or cultural resources in other regions of the world?

Studies of biodiversity and cultural diversity are often approached from the same perspective of extinction, rates of change, and threats of future loss. Globalization and the impacts of large development projects like dams, highways, and mines are viewed as common anthropogenic threats, leading to loss of both biodiversity and traditional environmental knowledge. Consequent efforts to protect both biological and cultural diversity—ratified at national and international levels—have followed (e.g. Convention on Biological Diversity, UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions). Yet this association of conservation and indigenous communities has at times produced uncommon allies. Before indigenous groups and conservationists were perceived as political allies, indigenous studies focused on self-determination, sovereignty and human rights (Conklin and Graham 1995). As Conklin and Graham state, “environmentalists’ primary goal is to promote sustainable systems of natural resource management. Indigenous peoples ultimately seek self-determination and control over their resources. The degree to which these two sets of priorities coincide is debatable” (Conklin and Graham 1995: 703).

Biologists’ concern for increasing extinction rates has led to the hotspot approach to conservation, in which conservation efforts prioritize areas of the world that contain high rates of endemic species (Myers et al. 2000). As a consequence of the hotspot approach, many national parks and protected areas have been established with the goal of minimizing human activity to preserve or restore biodiversity. The hotspot approach to conservation—and the emphasis on parks without people—has led to a backlash among local populations (West et al. 2006). Forced

relocations of local communities and indigenous people to allow for the establishment of natural reserves has led to adverse impacts on local populations through reduced access to land and natural resources used for traditional subsistence (Brockington and Igoe 2006). The displacement of people to protect flora and fauna has contributed to “conservation’s misanthropic reputation” (Kareiva and Marvier 2007).

While this is a well-recognized problem in environmental anthropology literature, the issue has gained recent recognition from conservationists and prominence in the media (Kareiva and Marvier 2007; Chan et al. 2007). Attempts have been made to incorporate local communities through integrated conservation and development projects; however these efforts have often failed to achieve their goals, leading conservationists to return to strictly enforced reserve boundaries (Dove 2006). As some biologists also recognize, this dilemma has led to conflicting agendas between “human welfare and biological conservation” (Chan et al. 2007). While many biologists advocate for the importance of bridging disciplinary divides, there are few examples of productive cross-disciplinary efforts.

The valuation of indigenous knowledge and practice is a central yet contentious component of studies of biocultural diversity, subjecting the field to numerous critiques. Language cannot be the only indicator for cultural diversity, as many distinct indigenous cultures no longer speak their native language. Studies of indigenous knowledge and practices can be criticized for exploiting local knowledge, while western valuation of indigenous lifestyles invites critiques of cultural imperialism. The politics of knowledge lead to great complexity.

In this paper, we examine the cultural politics of sustaining diversity from three perspectives: the relationship between biological and cultural diversity; biological conservation

and local communities; and the tension between complex explanations and simple understanding. In Section II of our paper, we question assumptions inherent in the biocultural approach, focusing on the language/species analogy. We provide a case study of indigenous language loss in Costa Rica to further exemplify the complications of using language as a proxy for culture, and describe eco-tourists' experiences of biological and cultural diversity through the safari in Tanzania. In Section III, we explore the interactions between biological conservation—often influenced by international priorities—and local culture. We describe the relationship between scientific and local knowledge, discuss the dangers of essentializing with the example of sacred forests, and present a case study of agroforestry in Panama. We finally consider the concept of complexity from post-equilibrium ecology to suggest future approaches to the study of biological and cultural diversity (Section IV).

## **II. CULTURAL AND BIOLOGICAL DIVERSITY**

### **Problems with the Culture/Species Analogy (Why Queens Is Not Like PNG)**

To address the question of the cultural politics of sustaining diversity—specifically biological and cultural diversity—it is necessary to examine in some detail the set of assumptions according to which it seems natural or indeed useful to include these concepts together in one investigation. Putting this as a question, we might ask how is it that cultural diversity and biological diversity appear to us as commensurate objects of a sort, and, furthermore, why is it that we feel it is important to ‘sustain’ each of these types of diversity? A large part of the answer to these questions lies in the tangled histories of the biological and human sciences, and in their mutual involvement with movements to promote environmental conservation and the protection of indigenous peoples' human rights. When we speak of ‘selfish genes’ or ‘cultural adaptations’ we participate in the same sort of process that allows us to speak of ‘schools of

fish', 'leaving the nest', or 'wild parties.' "Animals are good to think," Stanley Tambiah noted, pointing to the importance of nature-based metaphor for much human language and thinking (e.g., Tambiah 1969; see also Lévi-Strauss 1966). Borrowings between biological and social sciences have long been productive, and mirror the linguistic and epistemological exchange between the realms of culture and nature. The exchange of concepts between the biological and social sciences, often a metaphorical exchange, has been central to the production of knowledge in both realms. Marx, Durkheim and Weber all adopted approaches from the biological sciences. Indeed, Marx famously sent Darwin a copy of *Capital*, although his appreciation for Darwin's scientific method was not returned.

Yet Weber (1897) was well aware of how problematic an overly aggressive importation of biological modes of analysis into sociological method could be:

It is the method of the so-called "organic" school of sociology to attempt to understand social interaction by using as a point of departure the "whole" within which the individual acts. His action and behaviour are then interpreted somewhat in the way that a physiologist would treat the role of an organ of the body in the "economy" of the organism, that is from the point of view of the survival of the latter. How far in other disciplines this type of functional analysis of the relation of "parts" to a "whole" can be regarded as definitive, cannot be discussed here; but it is well known that the biochemical and biophysical modes of analysis of the organism are in principle opposed to stopping there. For purposes of sociological analysis two things can be said. First, this functional frame of reference is convenient for purposes of practical illustration and for provisional orientation. In these respects it is not only useful but indispensable. But at the same time if its cognitive value is overestimated and its concepts illegitimately "reified," it can be highly dangerous.

The emergence of ‘Social Darwinism’ and the Eugenics movement—both of which were considered to be progressive causes in their day—attested to his insight, and stand out as prime examples of the negative possibilities that can result from poorly considered borrowings between the social and biological sciences (Kevles 1985).

When we speak about cultural and biological diversity, and frame both in the language of sustainability, we engage in a metaphorical transference of ideas between social and biological science approaches, and between the conceptual spaces of nature and culture. Even when undertaken in the name of progressive politics, human rights, and environmental conservation, the patchy history of similar transfers alerts us to the possible drawbacks of such a strategy. In this section of our paper, we examine the literature on biocultural diversity, and examine in some detail the relationship between the notions of biological and cultural diversity found there. We attempt to raise questions of two sorts. First, we suggest that the very real differences between ecological and cultural diversity make their inclusion as part of a unitary concept of biocultural diversity problematic. Second, we suggest that the question of representation—of who speaks for marginalized cultural and linguistic groups and of how the ways that they represent these groups—has not been adequately addressed in the literature.

At the outset, it is important to acknowledge the important insights generated by the work of social and biological scientists and linguists working in emerging field that Maffi (2005:600) calls “biocultural diversity.” Not only are the discoveries of this literature significant, but the authors exhibit cultural sensitivity and, where they move from findings to advocacy, they advocate policies and research agendas that we find commendable. Maffi’s (2005) review provides a good overview of the emerging literature on biocultural diversity. The major undertaking of this body of work has consisted of identifying and exploring the implications of

the geographic correlation between areas of high linguistic diversity and areas of high biological diversity (Harmon 1996; Stepp, et al. 2004). As Maffi (2005:601) notes, “a focus on the relationships between linguistic, cultural and biological diversity, their global overlapping distributions, and the common threats they are facing emerged in the mid-1990s in the wake of an alarming . . . observation: that the ongoing worldwide loss of biodiversity is paralleled by and seems interrelated to the ‘extinction crisis’ affecting linguistic and cultural diversity.” Perhaps not surprisingly, the literature has a strong applied component, bringing together research and policy perspectives from non-governmental organizations and international institutions such as the IUCN (Borrini-Feyerabend et al. 2004; Oviedo and Maffi 2000).

### ***The extinction of languages and the language of extinction***

In discussing the ‘strong correlations between biodiversity and cultural diversity’, advocates of the biocultural diversity approach have tended to use language diversity as an index of cultural diversity. This is true not only of the ongoing GIS-based effort to correlate areas of high species diversity with areas in which linguistic diversity is high, but also is true of the conceptual bases underlying programmatic responses to the loss of biocultural diversity. Thus in a recent public address Dr. Ahmed Djoghlaif, the executive secretary of the Convention on Biological Diversity, quoted Milan Kundera’s comment that “culture is the memory of the people...a way of thinking and living,” in order to support his own assertion that “linguistic erosion is therefore a corrosive element of collective memory and of the identity and integrity of human communities” (Djoghlaif 2007). Yet while anthropologists have long recognized that language is cultural, and while the analysis of culture was for a long time approached from a

predominantly semiotic standpoint, the notion that language can be made to stand in for culture, and that the loss of linguistic diversity is thus a loss of cultural diversity, is a problematic one.

Questions within the discipline of anthropology about the isomorphism of culture and language date back to the foundational work of Boas, Sapir and Whorf. As Sherzer (1987:296) notes, more recent discursive approaches in linguistics have tended to undermine reductionist understandings of the language-culture relationship. An influential reconsideration of the notion of culture in anthropology has also drawn attention to the situated character of ‘culture’ and the role of individuals in constructing culture and reconfiguring their own adhesion to ‘a culture’ (e.g., Abu-Laghad 1991). Similarly, noting that recent anthropological scholarship has demonstrated that neither culture nor language can be considered as bounded entities, Briggs (2002:493) notes that ‘unfortunately, ... anthropologists still look to their linguistic colleagues for the sorts of formal, reductionist models of language that are *least* compatible with an understanding of culture as constructed, heterogeneous, polyglossic and hybrid and as both a product and a producer of difference and inequality’ (emphasis in the original). Peter Whiteley’s (2003) discussion of emerging ‘language rights’ advocacy, and Kay Warren’s (1998:69-85) discussion of essentialist strains within linguistic activism among the Maya provide alternative insights into this problem.

While the use of language diversity as an index of cultural diversity poses a problem for the biocultural diversity approach, perhaps more problematic is the way in which the loss of language diversity is framed as a crisis of language extinction in the literature. Two aspects of this form of presentation are troubling. First, the literature consistently decries a global crisis of language loss. Crisis narratives are necessarily normative statements, and are seldom made in the absence of a call to action and a plan for intervention. Often in such cases, the existence of a

crisis, and its perceived severity, are useful to advocates for motivating action and overriding political resistance (Dove and Khan 1995; Fortun 2001). In an insightful article, Whitely (2003) asks, “do ‘language rights’ serve indigenous interests?” He finds that the call to act in defense of language rights often overlooks deep-seated differences of opinion about the need for action within the group of language speakers whose rights are being advocated. The call to respond to a crisis can also obscure power imbalances within the communities for whom action is being advocated. When indigeneity becomes a valuable political resource, for instance, those who no longer speak their indigenous language may find themselves further marginalized: unable to interest NGOs in their plight, they may therefore be unable to claim access to certain forms of support for their communities. As in all cases of advocacy, it is important to ask who speaks, and for whom? Hill (2002) similarly raises questions about advocacy for endangered languages, in particular calling attention to problems of the ‘hyperbolic valuation’ of language diversity, and raising the issue of the problems of enumerating language diversity. It is also noteworthy that calls to save disappearing languages and cultures are many times not initiated by members of those cultures themselves. Indeed, while the disappearance of languages around the world is tied to government policies, national education programs, the operations of the market, and other phenomena within which minority groups have little decision-making power, it is also true that individuals adopt new languages, and abandon their ‘native’ languages and cultural practices, in accordance with their own sense of what will serve them best given their circumstances.

Second, it seems significant that the phenomenon of disappearing languages is consistently couched in the language of extinction. Maffi (1997), describing a conference titled “Language, Knowledge, and the Environment: Threats to the World’s Biocultural Diversity” notes that “an ever growing body of literature on endangered languages, vanishing cultures,

biodiversity loss, and ecosystems at risk is accumulating, attesting to the perceived gravity and urgency of such issues.” The trope is widespread, but found its widest public audience in the media attention surrounding Sutherland’s (2003) article in *Nature*, “Parallel extinction risk and global distribution of languages and species.” Noting that “there are global threats to biodiversity with current extinction rates well above background levels, [and], although less well publicized, numerous human languages have also become extinct, and others are threatened with extinction,” Sutherland (p. 276) seeks to “show, by applying internationally agreed criteria for classifying species extinction risk, that languages are more threatened than birds or mammals.” The explicit application of imagery drawn from wildlife biology—such as the use of the notion of ‘extinction’—to describe linguistic phenomena is problematic because of the very real differences between species of animals, on the one hand, and human cultural groups, on the other. This problem deepens when not only the language of biological science is used to describe cultural processes, but also the methodology.

### ***Methods and Maps***

Advocates of biocultural diversity preservation have adopted not only the imagery, but also the methodology of conservation biology as a part of the emerging research strategy and in order to make the case for intervention to stem the loss of diversity. This practice is intentional and is acknowledged by researchers working within the biocultural diversity approach. Preeminent among the research methods and strategies transferred to the biocultural diversity literature is that of GIS-based identification of ‘hotspots’ for language diversity. Several global mapping exercises have taken place, in which biological diversity has been mapped against linguistic diversity, as in Maffi’s (2005:617 C2) map of plant diversity and language distribution (based on Stepp et al.), and against the location of indigenous groups, as in the maps and

materials prepared for WWF's "Integrated Approach to Conserving the World's Biological and Cultural Diversity" (Oviedo and Maffi 2000). See figures 1 and 2.

Maps and the graphic presentation of remotely-sensed data are powerful tools of analysis, and are also particularly useful in setting agendas and directing policy (Pickles 1995). Their usefulness emerges in part from their ability to reduce a vast and complex reality to an easily understandable story. In maps demonstrating the effects of climate change, for instance, the areas of the earth that will be 'scorched' are invariably presented in fire tones of red and yellow. Because of their ability to simplify, and because those simplifications are used by powerful actors to plan and implement policy, maps are not only informative; they are also transformative, as James Scott (1998:87-88) reminds us. The ability to present a case through the use of GIS and remotely sensed data has thus become an essential element of establishing the truthfulness of a particular discourse of decline or disaster (Harwell 2000), and this would certainly seem to be true of maps that present the loss of language and biological diversity as co-terminal geographic hotspots.

Yet like other simplifications, maps are significant as much for what they omit as for what they include. The global nature of the crisis of biocultural diversity is thus reflected in the global span of the maps produced to illustrate the scope of the problem. As maps increase in scale, though, they increase in simplification, too. This is one of the great problems of attempting to present the phenomenon of diversity as a coherent object of analysis. Diversity is by definition *non-uniform*. Yet on global maps of linguistic diversity, each culture or language group is presented as essentially equivalent to another. Because remotely sensed data can have important political implications, the question of who collects data and who decides on the agendas for which the data should be used is also important. Almost by definition, marginalized

groups such as indigenous peoples and speakers of minority languages are excluded from processes of deciding what geographic data is collected about them and how it is deployed. As a result, there has been some discussion, for example, of whether indigenous groups might be able to claim a collective right to privacy from ‘eyes in the sky’ (Madsen 1994). What is important to recognize here is that maps are forms of representation, and the question of representation has been critical to discussions of indigenous rights for the past two decades. Decisions about who makes claims on behalf of whom, and about whose information and analysis ‘counts’, are critical issues that have plagued the encounter between indigenous groups and biodiversity conservationists, and which similarly must be considered in discussions about declines of biocultural diversity (e.g., Chapin 2004).

Beyond these general observations, it is important also to understand that maps of biological and cultural hotspots, and the processes of categorization that underlie them, direct attention in certain directions, and away from others. Stepp et al.’s GIS model, for instance, used the measure languages per km<sup>2</sup> as an index of cultural diversity, which was then mapped and compared to a mapping of vascular plant diversity per land area.<sup>1</sup> Yet different decisions regarding the scale of analysis will produce wildly different results when, for instance, number of languages per unit of land area is used as a gauge. The following examples would seem to confirm some commonly held preconceptions about language diversity:

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<sup>1</sup> Stepp and his colleagues are quite clear about the limitations of their approach; because of the paucity of data on language diversity they used a point to indicate the center of the highest concentration of language speakers of a given language, rather than using a method that incorporated the full extent of the language’s speakers.

$$\text{United States: } \frac{284 \text{ languages spoken}}{9,161,923 \text{ km}^2 \text{ of land}} = 0.3 \text{ languages per } 10,000 \text{ km}^2$$

$$\text{Papua New Guinea: } \frac{833 \text{ languages spoken}}{462,923 \text{ km}^2 \text{ of land}} = 18 \text{ languages per } 10,000 \text{ km}^2$$

Given what we know about Papua New Guinea—that it is inhabited by a large number of different language groups and that its land area is much smaller than that of the United States—we are not surprised to find that Papua New Guinea has a rate of language diversity 60 times higher than that of the United States. Yet when we change the object of analysis from the level of the country to a much smaller area, we obtain a much different result. If we look at the borough of Queens in New York City, for instance, we find that Queens has a level of language diversity 250 times the level found in Papua New Guinea.<sup>2</sup>

$$\text{Queens, New York City: } \frac{138 \text{ languages spoken}}{305 \text{ km}^2 \text{ of land}} = 4524 \text{ languages per } 10,000 \text{ km}^2$$

The point of this exercise is not to ridicule the work done by linguistic and biocultural geographers, who are well aware of the limitations of their own analyses. In addition to Stepp et al., Harmon and Loh (2004) and others have explored in detail the problems of presenting

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<sup>2</sup> US land area from the World Factbook (CIA 2008). Number of languages in US and PNG, and land area of PNG, from Harmon and Loh (2004). Information on Queens from the 2000 report of the State Comptroller (McCall 2000).

language diversity geographically. Yet the Queens example demonstrates two important aspects of the biocultural diversity problem. First, maps can be made to tell different stories. It seems that, measured at smaller scales, levels of linguistic diversity are likely to be much higher in cities than in rural areas; if this is true, then language diversity is in fact highest in areas where biodiversity is likely to be the lowest. This is of course the exact inverse of the correlation proposed by the literature on the relationship between language and species diversity. Second, the reason that language levels in cities are higher is because people tend to move around, and to carry their languages with them. So, while one aspect of culture may be involve people's relationships with nature and with their *milieu*, languages and cultures are not *only* rooted in one geographical location or environmental zone.

This second observation gets to the heart of our intervention into the question of the cultural politics of biocultural diversity. In essence, while we find that the notion of biocultural diversity is a provocative one and we are sympathetic to the aims of its proponents, we are not entirely comfortable with the transference of the modes of observation and analysis from the realm of conservation biology to the social sciences. In part, our concerns stem from the very real differences between biological species and human cultural or linguistic groups. At a basic level, the biological species is the group of all individuals that can reproduce with members of the same species. Determining which organisms are members of a species is thus a relatively simple matter. Cultural groups are far less bounded and are far more fluid, and membership in them can not be ascertained objectively. Individuals may belong to more than one linguistic or cultural group, and they may move around, leaving their rural habitats for urban ones like Queens, for instance. Furthermore, when a language 'dies', it is not necessarily true that an entire set of cultural affiliations is also disappearing. The same can not generally be said when a

biological species becomes extinct. Indeed, while the category of the species is determined biologically, anthropologists have been at great pains to distance the idea of culture from the biological determinism that characterized much anthropological analysis during the late 19<sup>th</sup> and early 20<sup>th</sup> century.

For many of the same reasons that Western audiences have long been receptive to biological explanations of cultural and racial difference, narratives that place indigenous people and other marginalized groups closer to nature and correspondingly farther from ‘civilization’ have long retained their popularity in the Western imagination. This environmental ‘othering’ is also taking place within the discussion of biocultural diversity: the visual and methodological similarities between a map of biological ‘hotspots’ and disappearing languages, or the use of terms such as ‘language death’ or the ‘extinction crisis’ of cultural diversity appeal to deep-rooted sentiments held by largely Western audiences. When we see the images of indigenous people that illustrate WWF’s map of cultural and biological diversity (in figure 2), it is their exoticism that provides color and excitement to the visual presentation—their rarity and their endangered status marks them as similar to rare and exotic endangered species of animals, a resemblance which is further reinforced by the mapping of indigenous peoples’ habitats over the habitats of endangered species. The visual effect is similar to that produced by the covers of two large coffee-table books issued by Conservation International (Figure 3), in which stylized images of indigenous people alternate with images of rare animals. While indigenous groups and their advocates have often been able to take political advantage of the perception that their relationship with the natural world is ‘balanced’, the construction of environmental identities for cultural others can also go sour (Conklin and Graham 1995; Fisher 1996). Appeals to ‘green orientalism’ also reflect power imbalances that create openings for the ‘cannibalistic western

logic that readily constructs other cultural possibilities as resources for western needs and actions' (Haraway quoted in Lohmann 1993:202). We would like to urge a consideration of who creates these representations, and we would like to ask whose agendas are advanced, and whose voices are not included, when these forms of representation are used to create narratives of crisis or to urge political action. It seems likely that political strategies based on such representations will have consequences for those who are unable to make their voices heard.

### **Is Language Commensurate with Culture? The Case of the Boruca of Costa Rica<sup>3</sup>**

While language is commonly used as a proxy for cultural diversity, we provide an example of a distinct indigenous culture that no longer speaks its indigenous language. Although Costa Rica is commonly recognized for its biological diversity, it is less well known for its cultural diversity. "Here there are almost no indigenous people" is a common refrain. However 63,876 indigenous people lived in Costa Rica in 2000, accounting for approximately 2% of the national population (INEC 2000). Costa Rica's indigenous population is comprised of eight ethnicities living on 24 indigenous territories, mostly in the southern part of the nation. This rural area of the country is less frequented by tourists, and is characterized by higher levels of poverty and less access to health care and education (MIDEPLAN 2002). Unlike nature, cultural diversity is not part of Costa Rica's national image; many indigenous people report feeling marginalized and forgotten.

In this subsection, we describe the dynamics of Brunka language loss and consider the influence of changing Costa Rican government policies on reducing and sustaining cultural diversity. The Brunka, also referred to as the Boruca, are one of the indigenous groups currently

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<sup>3</sup> Fieldwork for this section was conducted in Costa Rica in 2002, 2003, and 2004.

living in Costa Rica. They inhabit two territories in the southern part of the country, Boruca and Rey Curré, and have been in contact with non-indigenous populations since the time of the Conquest. There has been a severe and rapid loss of indigenous language use over the past century, which was accelerated by the introduction of the government school system in the late 1800s and its policies of homogenization. Today Costa Rican national policy emphasizes indigenous diversity, and the Brunka language is taught in indigenous schools along with other aspects of culture that include crafts, agriculture, religion, indigenous world view, housing, dance, music, health, food, social organization, and traditional clothing.

The Brunka language, like the ethnicity, was an amalgamation of many languages from the Chibchan indigenous groups that were ‘consolidated’ in Boruca during the Spanish conquest (Pittier 1940). Brunka, even in its mixed state, is a Chibchan language (Gagini 1917). Due to the long history of interactions between the Brunka and the Spaniards, the Brunka were commonly incorporating Spanish into their speech by the end of the 1800s. Studies of the Brunka language in the late 19<sup>th</sup> and early 20<sup>th</sup> century already predicted the decline of the language (Pittier 1941, Gagini 1917). In the 1890s, Henri Pittier commented that the language was “impoverished, as evidenced by numerous Spanish expressions” (1941:7) In 1917, Carlos Gagini took a further step to predict that Boruca was “most likely to disappear first” out of Costa Rica’s remaining indigenous languages (p. 33). While the decline of Brunka was not yet evident in the number of speakers, it was first seen in the quality and integrity of the language, which was encroached upon with Spanish phrases.

In 1887 a state-run school was established in Boruca (C. Rojas, personal communication, Aug 2004). This was probably the first government school to be established on an indigenous territory in Costa Rica, yet another example of Boruca’s long history of exposure to outside

influences (C. Rojas, personal communication, Aug 2004). The impact of the government school in Boruca was dramatic; the indigenous language was prohibited in class and successive generations were forced to speak Spanish in school. During the fifty to sixty years after the school was founded in 1887, the number of Brunka speakers plummeted. In 1961, the American anthropologist Doris Stone reported that “only 51 Borucas speak their mother tongue...the majority has forgotten their own language, accepting Spanish completely” (1962:39). The Costa Rican linguist Adolfo Constenla reported from his field work in Boruca in 1975-76 that “the majority of the tribe does not have active command of the language or doesn’t understand all of it” (Maroto and Constenla 1979:39), while by 1986 the Costa Rican anthropologist Maria Eugenia Bozzoli reported simply that “the Borucas speak Spanish,” mentioning 5 older people in the town of Boruca who still spoke the language and 11 who understood it (1986:60).

Over the generations, the number of fluent Brunka speakers has declined dramatically. A few children and grandchildren of Brunka speakers remained in 2004 who understood the language fairly well, but could not speak it; they are now parents and grandparents themselves. In 2004, Carmen Rojas from the Costa Rican Ministry of Indigenous Education estimated that 5 or 6 Brunka speakers remained, but only three of them had consistent recollection of the language (personal communication, Aug 2004). She estimated that about 40-50 semi-speakers were still living in Boruca, and about 200 people knew some phrases. According to the National Census, the total Brunka population in Costa Rica was 2,017 people in 2000 (INEC 2000).

### ***Why did the Brunka language disappear?***

Don Ismael González, a Brunka elder born in the late 1920s, recounted that beginning with his generation, “we don’t speak” Brunka any more (I. González, personal communication, Aug 2002). Ismael explained that he could understand Brunka because his parents spoke it to one

another, but Spanish was the predominant language in the household. His grandparents, however—the generation before the school came to Boruca—spoke only Brunka. “The teachers weren’t indigenous, they came from San José and they prohibited [my parents] from speaking their language. They were scared of speaking their language. Since then people haven’t practiced speaking,” he said (I. González, personal communication, Aug 2002).

Similarly, a middle-aged Brunka man recalled that he used the dialect as a young child when he needed to speak with his grandparents 40-50 years ago: “My mother would send me to my grandmother’s house with some cacao to exchange for eggs, and to do the errand as a young child I had to know the dialect, because my grandparents only spoke Brunka” (L. González, personal communication, Aug 2004). As a result of the school system, he explained that the Brunka became embarrassed to speak: “In the schools when the teachers came from San José and the children were speaking in the dialect, the teachers say how ugly it is, and the Indian feels ashamed—its better if I don’t even speak—and he remains quiet,” he said (L. González, personal communication, Aug 2004).

The remaining speakers began to age and pass away. Those who knew the language chose not to speak it any more. Many remaining Brunka speakers have begun to suffer from memory loss and cannot always recall the language (C. Rojas, personal communication, Aug 2004). Don Ismael said:

“If I were to hear an old woman speaking the dialect I would understand her, but I can’t speak. Easy words, yes: animals, things, names. For example the human features, I know eye, nose, teeth, in our dialect. Bones, meat, stone, leaf, earth, tree, I know those words, but I can’t converse in the dialect. And this is at my age. But the younger people speak even less,

and it doesn't interest them either" (I. González, personal communication, Aug 2002).

J. Diego Quesada's (2000) article, *Synopsis of a Boruca Terminal Speaker*, examines the role of the educational system in eliminating the Brunka language. Quesada noted that the Brunka were bilingual since the colonial period, but the initiation of the school system caused the Brunka language to be eliminated from public life. The initiation of compulsory elementary education at the turn of the 20<sup>th</sup> century was "pivotal in the death of Boruca" (Quesada 2000:6). Quesada reported that two elderly speakers had scars on their heads from teachers who had beaten them with textbooks as a punishment for speaking Brunka in class (2000). While the generation born at the turn of the century learned Brunka in their homes, they did not pass it on to their children: after being physically punished for speaking Brunka in school, their own children were raised speaking mostly Spanish within the household (Quesada 2000).

Today, the indigenous education system in Costa Rica has improved dramatically—but for Brunka, it may be too late. Formal language classes were initiated in Boruca and Rey Curré during the past fifteen years. Indigenous teachers began Brunka classes in the schools of Boruca in 1990, and they began language classes in Rey Curré in 1993. In 1995, the Costa Rican Department of Indigenous Education was formed to oversee indigenous education throughout the country. At the Ministry of Indigenous Education, Carmen Rojas noted that the quality of indigenous education depends on a sense of ownership: it is important for the indigenous communities to feel that their education "belongs to them and is for them" (C. Rojas, personal communication, Aug 2004).

While schools are now teaching the indigenous language as well as other components of indigenous culture, many younger students prefer English. As one elder commented, "they have

been teaching [Brunka] for years in the school, but you don't see a difference. The teachers are indigenous as well. But people are more interested in English than in their own language” (personal communication, Aug 2004).

As a Costa Rican shaman from the Bribri indigenous community commented in 2003, the effect of changing government policies and priorities is disorienting. First the schools forced indigenous people to speak Spanish and punished them for speaking their language, “and now they tell us to teach our native language and culture” (personal communication, July 2003) In the case of Brunka, this language was almost forgotten. “The white people pull us from one side to another, like drunkards riding a horse” (personal communication, July 2003).

### ***Beyond the language proxy***

Biocultural diversity literature suggests three implications of the language proxy: the dynamics of language loss would be similar to the dynamics of species extinction; a loss of language would imply a similar loss of culture; and areas of high linguistic/cultural and biological diversity would coincide. Along with linguistic extinction, one might expect precipitous rates of decline in traditional knowledge and accompanying loss of species as a result of government policies and modern development. Yet the Brunka example reveals the complexity of each of these assumptions.

While language is commonly used as a proxy for cultural diversity in broad scale studies, this case study points to the potential oversights of such an approach. The Brunka, who speak Spanish as their first language, may not be considered in a cultural diversity index. However, they remain a distinct indigenous ethnicity, pointing to the need for studies to go beyond the presence of distinct indigenous languages as an indicator of cultural diversity. The near

extinction of the Brunka language does not imply a similar level of total cultural loss; knowledge and practices are other important components of cultural diversity.

The dynamics of Brunka language loss may initially resemble the dynamics of species loss—like the IUCN criteria for endangered species, the declining Brunka language was influenced by reduced population (if defined by number of speakers), hybridization, and competitors (IUCN 2001). However, the trends in Brunka language loss and reacquisition have been influenced by changing government policies that were intended first to homogenize and then to differentiate indigenous people. This case demonstrates the impact of national education policies on cultural diversity—Brunka language loss has been directly associated with the establishment of the government school in Boruca. The influx of non-indigenous population to the indigenous territories after the opening of the Inter-American Highway in 1960 may have also played a role in reinforcing the use of Spanish and discouraging Brunka. The politics of sustaining diversity are extremely complex.

The Bribri shaman's analogy for Costa Rican government policies illustrates the cultural politics of sustaining diversity. While from an external perspective teaching indigenous languages in the schools is a unambiguous move in a positive direction, encouraging diversity, for a member of the indigenous population it is a disorienting jerk on the reins, a drunkard riding a horse. This emphasizes our argument that measures to maintain or restore diversity are viewed distinctly by different populations. Modern educational policies to encourage indigenous language use cannot be isolated from the consequences of past policies and historical language loss. Changing cultural values also play an important role on language use—while the Costa Rican government and indigenous people value the Brunka language from the standpoint of cultural heritage, many young people today value English for its practical benefits related to

tourism and employment. It is also significant that the transmission of Brunka has changed: while the language was previously learned in the home, today it is learned formally in the educational system. Language transmission has been given an institutional structure that will ensure its perpetuation—yet it has become a more formal relic of past culture rather than a living language used to express daily life.

Language is a useful proxy for culture because it is comparatively easy to define and quantitatively measure, as opposed to knowledge, which is more subjective, more difficult to analyze in terms of change, and more invasive to study. Yet Brunka culture did not decline at the same rate or degree as the Brunka language. While the Brunka speak Spanish, they continue to self-identify as indigenous people; they are a genetically distinct population (Barrantes 1993); and they are recognized as an indigenous ethnicity by the Costa Rican government. Beyond the loss of language, a complex mosaic of practices and beliefs comprise Brunka culture—traditional holidays, manufactures, architecture, and agricultural practices, for example. While there has been a loss of diversity in many aspects of the Brunka lifestyle and a trend toward modernization—less varieties of corn are cultivated today than 50 years ago, for example, and many traditional manufactures have been replaced with commercial substitutes—there have also been hybridizations of traditional and modern techniques. Traditional New Year’s ceremonies have been revived, and some traditional crafts like weaving and masks have diversified and increased in importance due to their marketability in the tourist trade.

The premise that areas of high linguistic and cultural diversity coincide is complicated by the scale of analysis. On a national level, Costa Rica is viewed as biologically diverse and culturally unimpressive. Yet on a regional level, Buenos Aires province of southern Costa Rica is

considered to be both environmentally and culturally degraded. At an even smaller scale analysis, the Brunka community, some elements of culture are lost while others are maintained.

The connections between biological and cultural diversity are not linear or unidirectional, nor do they necessarily co-vary. Forces that serve to promote conservation of biological diversity may simultaneously threaten cultural diversity: While eco-tourism provides an incentive for biological conservation of habitats, it provides no incentive for the conservation of indigenous languages. To the contrary, it encourages people to learn English, since it is more profitable in the tourism industry than Brunka. The indigenous language may give authenticity, but practical and economic considerations are also important. At the same time, tourism encourages the production of traditional handicrafts, which could be viewed as a resurgence of culture or an increase in diversity.

Globalization and development have contributed to both environmental and cultural change in Costa Rica and elsewhere. While these changes are typically assessed from the perspective of loss—loss of forests; loss of species; loss of language—environmental and cultural change need not be exclusively analyzed from this perspective. Biological diversity conservation has seen a move away from hotspots (a focus on how many species) to ecosystem services (a focus on nature's value to people), a paradigm shift that could similarly inform studies of cultural diversity. Just as the ecosystem services approach has demonstrated the value of agricultural landscapes, an ethnographic approach to cultural diversity that goes beyond language to consider other facets of culture can demonstrate the complex dynamics of change within populations.

## **Conflating Cultural and Biological Diversity in Time and Space: The Safari**

The word safari tells a story of Africa, Nature, Adventure. It recalls a colonial past, resonates in the present, reaches towards an imagined future of travel and exploration. The notion of safari reverberates not only through time but across the Sahara and the Atlantic, permitting a purchased safari experience that is lived via the cars and roads of Tanzania (Anderson 1991). Most packaged-tour safaris that cater to mass tourism employ and support various technologies of travel, seeing, and commodifying the safari experience. The Tanzanian safari is a purchased trip through the supposed wilderness of the northern ‘bush’ country, usually including paid visits to Maasai cultural villages alongside days of wildlife viewing in the biologically diverse Serengeti or Ngorongoro.

The apparent cultural and biological diversity of Northern Tanzania is constantly reinforced (and thereby given international significance) by the continued existence of the safari tour, its presence in the social imagining of the protected areas, and the connections established by technology on safari.<sup>4</sup> This experience of nature and culture, dubbed biological and cultural diversity, often embodies class and race relations, for it is the tourist who comes to experience diversity and the local people who must provide that experience. The vast majority of these tourists’ journeys across the Tanzanian landscape involve the automobile and, to varying degrees, its associated web of roads and regulations, villages and villagers; it is a rapidly

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<sup>4</sup> Data for this study was collected in 2006 through semi-structured interviews with tourists, driver guides, safari company employees, cultural boma workers, and administrative officials in Ngorongoro Conservation Area (NCA), Serengeti National Park, and ‘AS,’ one of the largest safari operators in Northern Tanzania. Participant observation was conducted at the AS headquarters and in souvenir shops, tourist hotels, protected area camp sites, cultural tourism bomas, and on tour in NCA and Serengeti.

globalizing 'system of automobility' that mediates the tourist experience of nature and culture (Urry 2004: 26).

When Schmitt conjures up his notion of the 'spatial revolution' sweeping Europe in the age of Empire, (Schmitt 1997: 28) he speaks of the movement from land to sea; today, the swiftly growing 'system of automobility' (Urry 2004: 26) holds similar implications for the modern view of landscape, movement and the other. The vehicle, essential to this system, encloses and therefore mediates between the subjecthood of the passenger and the objecthood of her or his appraisal: the landscape and inhabitants of Tanzania, its biological or cultural diversity. As Marx tells us, the tool mediates between nature and society, between what the tourist believes is 'first nature', that which is original or unknown, and 'second nature,' that which is artificial and known (Schmidt 1971).

The safari helps to challenge rigid divisions between inside and outside, between public and private, through the technology of the safari truck. The vehicle is the constant thread that weaves its way through each of these themes, the technology that serves to mediate the tourist experience of intimacy with nature or culture, privacy in public, and the synergistic relationships among car, driver and passenger. According to Heidegger in *The Question Concerning Technology*, through technology man is 'challenged forth into [a] revealing [that] concerns nature, above all' but is forced to recognize that nature, via technology, loses its objectness through the human effort to order and keep nature in 'standing-reserve' (Heidegger 1993: 326). The dangerous challenge of 'enframing' the world through technology is that it 'blocks the shining-forth and holding sway of truth' (Heidegger 1993: 333).

This is the impetus that permits roads or rails across the landscape to become mere communication, the disturbed land mere ‘standing-reserve’ for future use. It is the same theme that resurfaces under the guise of safari, which embraces continual movement and manipulates perceptions of that which is beyond the windshield. Seen side by side, and made possible through the automobile, a visit to a Maasai cultural village sandwiched between game viewing in the Ngorongoro Conservation Area NCA or Serengeti National Park blurs the lines separating nature from culture, on safari. Both are simply parallel elements of the world-as-view, and through technology on safari the colonial practice of relegating people to the level of wildlife makes its contemporary appearance.

This technique of viewing is rooted both in particular ideas of place and the ‘other’ (Serengeti, Ngorongoro, safari, Maasai) and in notions of time. The tourist of today often imagines that in visiting Tanzania he or she is following in the footsteps of early European explorers and cartographers like Livingstone and Stanley or Burton and Speke, though the actual map-making is left to the expertise of others (and satellite imagery). There is the constant need to transfer the 3-dimensional into the 2-dimensional on safari, and the map is much like the window, the television or computer screen, the photograph, the journal entry. In the example of the map, however, it is purchased intact and can be folded and taken away, shown to others post-safari to give scale and direction to the photographs and souvenirs that also made their way home. Unlike the attributes of automobility like the car and the road, which are directly implicated in the system, the map is an accoutrement that exudes an air of ‘virtual’ rather than actual automobility (Miller 2006).

Often, a tourist map will present only the roads relevant to the visitor, assuming that she or he would hire a safari company for transport and keep the map as a Tanzanian memento. The

roads not directly connecting one tourist site to another become irrelevant, forgotten, left off the map. Though photography appears to have supplanted cartography as an exercise in domination after colonialism, the who-what-when-where-why-how of viewing still follows the contours of those early maps, reconstructing the bits and pieces of them that mirror the ebb and flow of the safari.

Alongside the technologies of automobility, money frames experience and likewise the representation of that experience, controlling the location and trajectory of the safari. Like any capitalist system, money ensures both a more private safari experience and a more lengthy one. Early in 2006, a group of four clients was sent to the AS safari company by one of the upscale American agents who works with the company. It was not a cookie cutter package tour but a more carefully tailored, therefore more high-end, travel schedule. Their itinerary included a leisurely trip through Manyara, Ngorongoro, and Serengeti, with stops at local ‘villages’ and day hikes near Manyara and in and around Ngorongoro. Budget travelers in NCA and Serengeti, however, tended to leave the confines of their vehicles only while visiting an official cultural boma or disembarking at the hotel after a long day of game viewing. They seemed cut off from most of what they were viewing, unable to participate in more diverse cultural experiences, constricted both by their socio-economic class and the technologies of the tour.

To view or photograph a cultural village, local people, or a scenic vista, the tourist must pay, and it is this monetary exchange, alongside the technologies of automobility like the car, map, and road, that provides access and gives meaning to notions of diversity. Inside the NCA,<sup>5</sup> there was a stark difference between the behavior of people on the primary road and those on

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<sup>5</sup> The Ngorongoro Conservation Area (NCA) is a multiple land-use area, with wildlife, livestock, and Maasai people living within its boundaries.

subsidiary trails. Even in less-traveled areas, the local inhabitants were much more likely to acknowledge passing vehicles on the main road than the secondary ones rarely frequented by tourists. Children tending sheep and goats would chase after trucks, calling out ‘pen for school’ or ‘give me money’ or ‘jambo’. On the roads not traveled by foreign visitors, children would turn their backs, duck shyly out of view, or even run away asked for directions. Because the primary roads have been commoditized by the safari tour through its purchased views and calculated experiences, they are similarly perceived by local Maasai as conduits of economic exchange, opportunity, even cultural diversity.

Visitors do not have complete control over what or who or where they photograph; local Maasai people often solicit trade with tourists or offer to pose for photographs by the road in exchange for money. Rather than passive participants in the commercial safari they often seek out, initiate, even benefit monetarily from these roadside exchanges. The characteristics of these technologically and monetarily mediated interactions therefore contrast with the standard ideology of diversity-speak; instead of cultural diversity being something viewed by the visitor, it becomes something that might be experienced by the locals as well.

The silent challengers to this Heideggerian pattern of enframing via the safari ‘system of automobility’ are the Maasai inside the NCA who constantly appropriate and thereby remake automobility. They confront the car as the sole mode of transport by walking and occasionally riding bicycles from morning to night, often in the middle of the road. But this doesn’t mean that they don’t hope for a lift or try to flag down vehicles going in their direction. On numerous occasions during visits to Ngorongoro in July and August, people were welcomed into the research vehicle (usually young men) for a ride to villages or bomas on or off main tourism routes, which increased researcher credibility with the Maasai. Soon the Land Rover was

jokingly referred to as the Maasai *daladala*, or shared taxi, and young men who recognized the truck would try to wave it down and climb onto the roof or back of the vehicle when the interior was full. They seemed to take pleasure in ignoring the various rules of transport that AS and other tour companies followed in the protected areas, like encouraging seatbelt use and discouraging passengers from ‘standing on seats.’ They obviously believed that the regulations enumerated by the NCAA on tourist permit receipts were written for tourists and their drivers, not the local inhabitants.

These NCA inhabitants also sought to flag down or approach tourist vehicles in the hopes that the tourists might be interested in purchasing wares or taking (and then paying for) a photograph of a Maasai outside the cultural bomas. Again, this is expressly against the rules of the NCAA (NCAA 2006). It also succeeds in halting the vehicles enmeshed in the movement-centered safari and thereby challenges their reliance on mobility. In both situations, the Maasai people encountered seemed to disregard the ‘dominant culture’ of automobility by discounting the ‘common sense’ of the road and the rules of the car that supported the system. By denying the primacy of movement in Ngorongoro, they also appeared to challenge the placelessness that such constant mobility engendered among tourists on safari.

The Maasai living inside the NCA seemed to be challenging the role of automobility in creating a generalizable world-as-view—one of many commodified views of diversity—from their surroundings. In embracing the commoditization of the road via the safari tour, these local Maasai people claimed partial control over both the tendrils of capitalism and the notion of who might experience and benefit from the apprehension of cultural diversity. Their refusal to acknowledge common rules of automobile travel signaled not ignorance, but a rejection of the

primacy of the safari vehicle in defining experience, perception, and representations of diversity in the NCA.

### **III. BIOLOGICAL CONSERVATION AND LOCAL CULTURE**

#### **The ‘Shaman’s Apprentice’ and the Elusive Concept of Local Knowledge**

In thinking of ‘local’ indigenous environmental knowledge, the Shaman’s apprentice fantasy appeals to the Western imagination: a researcher clad in khakis, trekking deep into the rainforest, encountering a tribal elder who slowly reveals the hidden mysteries of his tribe’s ancient plant wisdom to the awe-struck researcher (Hayden 2003). The subtext to this vision is that the researcher, armed with scientific knowledge, is able to then transform ancient plant wisdom into a cure that is useful for people around the world, thus both saving lives and producing profits. There is a certain appeal to this story, certainly, which is why it has captivated audiences ranging from development funding agencies to aspiring ethnobotany students in the United States. Circulating such ideas of indigenous knowledge, however, necessitates a closer examination of the corresponding binaries often produced along with the narratives. These binaries include local / global (or universal), indigenous / scientific, and nature / culture (Castree 2005). Within these binary frameworks, scientific knowledge is usually coupled with universal, cultured knowledge produced without bias, and applicable to nearly all circumstances. Indigenous knowledge, in contrast, is usually connected to exclusively local domains, and is often assumed to include an inherent affinity for nature and conservation (Ellen et al. 2000).

While the acknowledgement of indigenous knowledge systems as potentially environmentally constructive is a welcome development from the assumptions that often

villainize ‘peasants’ in the developing world as forest destroyers, it is nonetheless useful to complicate any simplistic pairings of certain groups of people with certain types of knowledge production (Dove et al. 2007; Agrawal 2002). Reconsidering entrenched binaries proves intellectually challenging, however, although paths have been suggested by scholars and practitioners, allowing one to move away from essentializing concepts of societies, communities, and knowledge. Such theoretical strategies include seeing knowledge as a spectrum ranging from scientific to local (Agrawal 1995), treating scientific knowledge itself as a form of localized knowledge production (Latour and Woolgar 1986), or attempting to transcend categories of indigenous / scientific in order to forge a more holistic understanding of the place of knowledge in larger social and environmental systems (Dove et al. 2007).

Working on the ground, environmental development programs may deliberately work towards overcoming knowledge binaries by forming a hybrid understanding of nature, whereby selected aspects of the local knowledge of farmers or indigenous groups are combined with the scientific knowledge brought by scientists or extension agents (Manning 2001). For example, in working with Peruvian farmers as part of a McKnight Foundation funded partnership, university scientists partnered with representatives from local communities to combine molecular plant breeding knowledge with local knowledge on the tuber varieties of the Andes. Project leaders attempted to incorporate this blended knowledge into all stages of project development and implementation, including defining a research question and articulating the potential ways in which laboratory science could best be applied to address issues of food security for marginal communities.

When advocating such “blended knowledge” however it is important to remember that scientific knowledge carries with it both greater networks of power, and afforded a higher degree

of authority (Hacking 1983). Thus, the tendency is to hold local ideas of nature and the environment up to scientific models, to see how they match up; any discrepancies between the knowledge systems are nearly always interpreted as local knowledge getting things wrong. Additionally, projects seeking to blend local knowledge with scientific knowledge, such as the plant breeding program mentioned above, may encounter complex questions of intellectual property rights: when is environmental knowledge considered to be in the public domain? How can ownership for local environmental knowledge be traced back to specific individuals or places? Such questions soon become morally, legally, and epistemologically challenging, as knowledge networks are nearly always fuzzy and laden with layers of political power and interests (Hayden 2003).

Additionally, local knowledge often refuses to stay in place. As Hayden (2003) points out in her discussion of bioprospecting in Mexico, often the environmental knowledge of medicinal plants thought to be found “deep in the jungle” is actually most often found in the bustling, multicultural spaces of urban markets. Knowledge is continuously shared, modified, invented and circulated. The propensity of knowledge to diffuse further complicates the binary of local / global outlined above. As an increasing volume of information and images is circulated through the Internet, tracing the origins of a particular knowledge to a particular local place or group seems a daunting, or even misguided, enterprise.

It is also important when undertaking ethnoscientific inquiries to investigate the connections between knowledge production and power within groups, governments and institutions. Knowledge is not created in a vacuum, but instead implicates the social and political inclinations and interests of the various actors involved. Such power dynamics may influence in what research or project questions are asked, and how the answers are both interpreted and

disseminated (Latour 1986; Kuhn 1962). When evaluating a knowledge system and its potential application to conservation enterprises, then, we must ask ourselves: what groups are generating this knowledge? What viewpoints may be left out? Who gains if the particular information is advocated for within projects and/or organizations? These questions are instructive ones to bring at each stage of knowledge production: to the laboratory, to the field, to the community, and to the office.

Complicating the binary relationships between culture and knowledge production can benefit the overall efficacy of conservation efforts in several ways. For example, being cognizant that 'indigenous' groups associated with any given biodiversity conservation priority may not necessarily be a homogenous group primarily committed to conservation goals may alleviate false expectations and subsequent disappointments between project partners. An instance of such disappointment and controversy involved the various high-profile international NGOs, which, as chronicled by Conklin and Graham (1995), forged a political alliance with the Kayapó indigenous group in Brazil. These groups ultimately found themselves disappointed and disenchanted as they realized that the assumed conservation values of the indigenous group did not adhere to the environmental actors' expectations (1995).

That is not to argue away the real potential offered by partnerships between environmental organizations, researchers, and community representatives. Partnerships between communities and environmental organizations offer much potential to addressing issues of conservation and development; these partnerships, however, have a greater chance of success when they view their partnering communities as composed of a diversity of environmental interests, goals, and skills (Tsing 1999). Thus, acknowledging that 'local' communities are not homogenous, but are in fact diverse and complex places, allow for a more realistic platform from

which to launch efforts such as community based conservation programs (Agrawal 1999). In fact, several authors writing on conservation and development argue that the mix of interests, goals, and backgrounds of partners provide interesting and useful “spaces for negotiation,” which, when navigated carefully, can increase the satisfaction all parties feel with development and environmental efforts (Li 1999; Tsing 1999).

Overall, then, in bringing into focus ideas of local environmental knowledge, scholars and practitioners must avoid binary assumptions that often are welded together to produce ideas of a ‘natural’ apolitical indigenous group intrinsically in tune with conservation ethics. Similarly, the knowledge such groups possess is not entirely localized, naturalized, or simple; in fact, many local systems of knowledge are complex, multi-sited, and derive from sophisticated epistemological frameworks. Thus, while it is useful to recognizing that forms of knowledge production are culturally influenced, indigenous or other local groups can neither be automatically valorized as ‘forest-friendly’ nor villainized as ‘forest-destroying.’ Such assumptions lead to failed development and conservation programs, often leaving in their wake misunderstandings and disappointments between all the participants.

## **The Problem with the ‘Sacred Forest’: Secular Grasslands, Among Other Things**

### ***A. The Sacred Forest:***

The concept of “conservation” has proven difficult to translate across cultures, and surprisingly given how little attention has been paid to this difficulty. Claims for having observed conservation in non-western societies are often disputed. For example, traditional practices that conserve resources without intending to conserve those resources (in the western

sense of the term) are often judged to not be true acts of conservation (Stearman 1994). One set of practices that seems to meet the test of identifiable conservation are the so-called ‘sacred groves’ or ‘sacred forests’ that have been observed in many non-western societies around the world (e.g., Fowler 2003; Freeman 1999; Sponsel 2005; Wadley and Colfer 2004). References to such forests are also abundant in the colonial-era literature (see the summaries in Bartlett 1955-1961, 2008/1956). The apparent fact that the vegetation in such forests has been protected by religious doctrine has been interpreted as reflecting a purposive, institutional commitment to conservation that cannot be denied. Sacred forests have been perceived as a welcome example of conservation in a sea of environmental neglect and abuse that appears to engulf western and non-western societies alike. The image of non-western peoples using religious doctrine to protect dwindling natural resources, often from western- inspired or driven development, has proven attractive to western audiences (e.g., in much the same way as women tying themselves to trees in India or Penan setting up blockades on logging roads in Sarawak). Such practices seem to hold up a mirror to the seemingly barren, secular character of resource-degrading life in the industrialized countries.

Anthropological interest in sacred trees and forests was popularized by Frazer’s “Golden Bough” (1951). It received passing support from the development of neo-functional analyses of the ecological functions of ritual in the 1960’s (Harris 1966; Rappaport 1968). But just in the past two decades there has been an efflorescence of studies of sacred forests — typically islands of relatively more mature and diverse vegetation — doubtless stimulated in part by the waxing (later to wane) of interest in community-based conservation. Exemplary work in this field is that of Sponsel (2005), whose article in the *Encyclopedia of Earth* on “Sacred Places and Biodiversity Conservation” is representative. For example, he cites (p.3) research in Zimbabwe

showing that deforestation is 50% lower in than out of sacred forests. He lists (p.4) the factors that appear to promote conservation of biodiversity inside sacred forests. His thesis, here referring to Indian data, is that “In India and elsewhere sacred groves appear to be, in effect, a very ancient, widespread, and important traditional system of environmental conservation that long precedes more recent Western strategies for protected areas like wildlife sanctuaries and national parks.” Although sacred forests may be ancient, Sponsel and other proponents say, they can no longer stand alone – they need our help. He writes (p.5) that sacred forests may need to be strengthened, augmented, recognized, and protected by outside forces. In order to do this, it is first necessary to assess the actual impact of sacred forests on conservation of biodiversity. Sponsel writes (p.6):

“In particular, there is a need for controlled comparisons between sacred places and adjacent secular ones of the same size and type of biotic community in order to describe and assess any differences that might arise because of sacred status. Hypotheses about the conservation efficacy of sacred localities have to be tested empirically and qualitatively, rather than relying only on assumptions and assertions.”

Sponsel’s call for empirical, controlled comparisons is perhaps prompted by the fact that the concept of sacred forests is most often used today not by anthropologists or other scholars but by community and environmental activists, and this usage is typically quite normative and uncritical in character. Our aim here is to examine the concept of the sacred forest not simply as something that describes a certain type of rural space but as something that produces a certain type of rural space (in the sense of Lefebvre 1991).

### ***B. The Critique of the Sacred Forest:***

The lesser enthusiasm among academics in deploying the concept of sacred forests is due to a number of problems with it. First, the concept tends to ignore or even erase cultural ecological history. The sacralization of fragments of forest often, and of individual trees almost always, occurs as part of a wider process of deforestation and landscape transformation (Bloch 1995; Dove 2003). To characterize the partial end-products of this historical process as evidence of religion-driven conservation artificially abstracts what is happening on a small part of the landscape at one point in time from what has happened on the landscape as a whole over a long period of time. It also reflects a very different view of what remains. In Java and elsewhere in Southeast Asia, for example, sacred trees and groves in and around villages stand in for, symbolize, the forest that the village ancestors cut down: whereas conservationists are interested in what remains (in the sacred grove), the focus of the villagers is really on what was lost (viz., the historic forest).

Contemporary environmentalist interest in sacred forests especially tends to ignore or erase the history of labor – referring here to human economic or productive activity. The conventional conservation interpretation of sacred forests is as places literally defined by the absence of profane productive activity. In fact, many forests thus protected in Southeast Asia are explicitly and formally open for use for hunting, gathering, and even extraction of timber and other materials for house-building. The native distinction in such cases is often not between sacred and profane uses, but between everyday needs and singular needs. The tendency to interpret sacred forest in terms of the former dichotomy versus the latter one is related to the

misleading belief that still dominates much of the conservation world: namely, forest that is sufficiently ‘intact’ to be worth conserving must be free of any history of economic exploitation.<sup>1</sup>

The difficulty in seeing economic activity in sacred forests reflects the fact that the concept of sacred forest reproduces a Cartesian divide between nature and culture. Religion and the sacred are of course cultural, but the concept of the sacred forest excludes culture in the sense of the mundane, everyday business of society. By focusing our conservation attention on the ‘nature’ that remains in tiny pockets of sacred forest, this view – mistaken in any case – directs attention away from the vast majority of lands on which people live, such as grasslands and savannas (Dove 2008). The focus on sacred forests represents an example of what Buttel (1992: 19) called “forest fundamentalism”. As Stott (1991: 18) writes:

“The dominant forest ideology is most unfortunate because it blinds us to the facts that the rain forests are not, and never were, the most widespread formations in the tropics, and that the majority of people eking out a living in the tropical world do so in lands derived from other, nonforest, formations, above all the savannas.”

The concept of sacred environments thus offers a very limited basis for conservation: the sacred character of such areas can be fragile, they are tiny, they are rarely expandable, and a focus on them diverts attention from the much larger ‘secular’ proportion of the landscape. Cronon (1996) critiques conservation that is focused on protected areas for analogous reasons: namely, he does not believe that nature that is not part of culture can be conserved.

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<sup>1</sup> Recent research, like Neidel’s (2006) in Kerinci National Park in Sumatra, demonstrates that even landscapes deemed worthy of protected area status have often been the site of long human occupation and environmental modification.

The concept of the sacred forest not only neglects the wider physical landscape, it neglects the wider political landscape. Proponents tend to see sacred forests as less explicable in terms of political forces, and less involved in the wider political economy, than is often the case. Indeed, the very idea of the sacred forest is of a place where profane matters like politics are absent. However, this dichotomization between the conserved environment and the world of politics is diametrically opposed to everything that the field of political ecology has discovered over the past two decades about the inability to understand ecological systems without placing them within wider relations of power and politics. The most astute early observers of sacred forests, like Bartlett, had an intuitive understanding of this fact. He continuously noted tensions between the native logics of sacred forests and the colonial forces of Christianization and ‘civilization’ (Bartlett 2008/1956). An understanding of the linkages between politics and the sacred, and the implications of this for our changing understanding of sacred forests, is reflected in the work of people like Sheridan (in press), who indeed regards such forests not as places exempt from politics but just the opposite, as “places of power”.

The erasure of politics from sacred forests is based on a view of them as static, in equilibrium. Their purported conservation function is, indeed, attributed to this equilibrium. They are regarded as places where the environment is protected because they are thought to be places where nothing changes, where change is held at bay by religion. But this view is flawed in several respects. First, it derives from a now discredited, equilibrium-based view of the environment, in which perturbation and change were seen as anomalous. According to post-equilibrium-based models, which now dominate both the natural and social sciences, it is change that is the norm and stasis that is the exception – which renders problematic the idea that a landscape must be insulated from change to be conserved. Ironically, these new models are in

greater accord with traditional cosmologies in many non-western societies, which are based on continuous cycles of creation and destruction (as in Southeast Asia). Finally, sacred forests can be as dynamic as any other part of the rural landscape (Sheridan in press). They are part of history, and their sacred character or lack thereof is a product of history. But even when their sacredness is holding steadfast, this does not mean that they do not play a part in wider, ongoing processes of social change. The interpretation of 'sacred' as 'inert' tells us more about the role of the sacred in the modern industrialized societies of the environmentalists than it does about its role in the societies under observation.

### ***C. Reflexive Thoughts:***

These critical assessments of the way that the concept of the sacred forest is deployed in contemporary environmentalism are difficult to swallow, because the concept seems on the face of it so benign and indeed helpful. In fact, however, it is limiting and constraining, in part because it focuses conservation attention on such a tiny part of the social and physical landscape. The physical scope of the concept is quite out of proportion to its political capital, which must raise questions: Why is it so attractive and so powerful? What does it achieve? For one thing, the vision of sacred forests is a localizing one, and over the past generation academics have become critical of the de-localizing consequences of modernity.

This vision of sacred forests essentializes and manufactures difference, difference between the metropolitan cultures of the environmentalists and the marginal cultures of those having sacred groves. The fact that it valorizes this difference (viz., eastern wisdom), in a reaction against the hegemony of western conservation principles, is well-intentioned; but this obscures its deleterious consequences. The idea of the sacred forest is presented as one that is basically alien to western traditions of conservation, and although this is its attraction, this is also

its threat. In this respect, the idea of the sacred forest is reminiscent of what Said (1978) said of Orientalism. And as Said asked of Orientalism, so can we ask here, What does the idea of the sacred forest tell us about western industrialized society, its environmental histories, its involvement with environmental histories of less-developed countries?

### **Regional Conservation and Local Communities: The Meso-American Biological Corridor in Panamá**

The ‘community’ is a convergence point for both the theory and practice of conservation. The concept of community has an established place at the center of increasing research into the parallels and linkages of so-called socio-ecological systems (see Cavalli-Sforza and Feldman 1981; Berkes and Folke 1998; Fraccia and Lewontin 1999; Berkes et al. 2003). Communities are considered to mediate major mechanisms of conservation such as the Integrated Conservation and Development Programs and Community-Based Natural Resource Management models of the latter 20<sup>th</sup> Century, as well as more recent initiatives to pay land-users for environmental services. The role of the community concept is especially noteworthy in recent trends towards larger scales of environmental governance that simultaneously rely upon devolution of resource control to relevant communities (Brosius 2006, Zimmerer 2000). This brings into question how a community can be defined, given the numerous elements that are conceptually, if not actually, mediated by this organizational unit. The following section presents the context and a specific case of community-level engagement of a transnational conservation effort in the Bocas del Toro Province of western Panama. These engagements demonstrate the intersection of two processes of negotiation and reconciliation, and they hold implications for effective conservation as a science and practice of change.

The Meso-American Biological Corridor (MBC) is a Global Environment Facility-supported<sup>6</sup> regional conservation initiative of unprecedented scope dedicated to the ‘sustainable management’ of natural resources. Initiated in 1997 and including territories along the Atlantic coast of Central America from southern Mexico to southern Panama, the MBC attempts to reconcile seemingly opposed interests in exploitation and conservation of resources found along the less ‘developed’ half of the continental divide of Central America.<sup>7</sup>

In Panama, the “priority area” of the MBC is located within the province of Bocas del Toro. This priority area encompasses marine and terrestrial protected areas, as well as a significant portion of the recently designated indigenous territory belonging to the Ngobe<sup>8</sup> peoples. In a major advance toward self-governance, the Ngobe won territorial designation in western Panama in 1997 and established a ‘comarcial’ government. The Ngobe have been identified as the most populous, the fastest growing and the most impoverished of Panama’s

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<sup>6</sup> The Global Environment Facility (GEF) is an independent financial organization, established in 1991, that provides developing countries with grants for projects that “benefit the global environment and promote sustainable livelihoods in local communities.” GEF organizes its funding around projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants (Global Environment Facility, 2008).

<sup>7</sup> This tension between conservation and development is demonstrated by the original programmatic association of the MBC with the Puebla Panama Plan (PPP). The Puebla Panama Plan is an Inter-American Development Bank-funded effort to structurally integrate – and liberalize trade with respect to – the same Atlantic region of Central America as the MBC. The MBC funds protected areas linked by buffer zones and “multiple-use” areas in order to maintain or increase biodiversity in human-inhabited landscapes. Meanwhile, the Puebla Panama Plan supports enhanced extraction of ore and timber, the production of agricultural commodities and hydroelectric power, and the infrastructural development such as roads and ports necessary to transport that which is extracted and produced. Further, in its evaluation of the MBC, the World Resources Institute defines ‘multiple-use zones’ as “areas devoted primarily to human use, but managed to facilitate the creation of broader landscapes that are hospitable to wild species” (Miller et al. 2001:vii)

<sup>8</sup> The territory, referred to as the *Comarca Ngobe-Bugle*, is also inhabited by the Bugle peoples. The Bugle, however, are not found in the communities included in this study.

indigenous groups (Vakis 2000, National Census of Panama 2000). In the past 100 years, the Ngobe have significantly increased migration back to their traditional Atlantic coastal lands. This is largely attributed to population pressures and agricultural mismanagement of interior lands, policy incentives for settling the Caribbean ‘frontier,’ extractivist national government policies within the territory, and wage labor inducements offered on banana plantations by the United Fruit Company (UFC) (see Young 1971; Wickstrom 2003; Bourgois 1988).

Over the same century-long period, numerous changes have occurred within social relations of many Ngobe communities. Young (1971) and Young and Bort (1999) provide the most detailed account of these changes, emphasizing the increased rate of cultural turnover. Certain customary features were diminished, such as polygyny, sororate, levirate, child betrothal, mother-in-law avoidance, leadership rituals (*krun*), as well as the hamlet settlement structure. Meanwhile, incorporation into the cash economy through wage labor was greatly increased, and traditional consensus decision-making has been adapted through growing involvement with outside agencies (Young 1971).

Most notable of the gains, losses and fusions that have transpired within Ngobe society over the past century is the Mama Chi religion. Beginning in 1961, this millenarian religious movement initially won the support of a very large segment of the Ngobe population. Young (1971) has argued that it was born of dissatisfactory political and economic relations with the non-Ngobe world. The Mama Chi movement revived certain traditional values and behaviors while rejecting others. Adherents were advised to avoid relations with the outsiders, even other Ngobe that may have become exceedingly ‘hispanicized’. Elements deemed representative of corrosive non-Ngobe culture, such as consumption of alcohol, as well as long-standing Ngobe traditions considered to be culturally malignant, such as the *krun*, were banned.

The Mama Chi phenomenon's reformative aspect, and the fact that it only gained the adherence of a portion of the Ngobe population, illustrates the dynamism and divisions that can be found within and between Ngobe communities. The diminution and loss — alongside gains and fusions — of certain cultural forms demonstrates that the complexity of Ngobe communities is not necessarily increasing, though it may be more explicit. This explicitness seems to result from increasing and compounding linkages between sectors and scales which has, in turn, led to a persistent lack of definition of 'community' amongst either scholars and practitioners.<sup>9</sup>

In 1982, the Ministry of Agricultural Development in Panama (MIDA) began an extension program that promoted a fast-growing and high-yielding hybrid varietal of cacao as a means of enhancing economic development of the Bocas del Toro Province. The promise of earlier and increased yields combined with a strong market price of over two U.S. dollars per pound led to widespread adoption amongst smallholders in the area. In the subsequent several years, many Ngobe farmers tripled the amount of forest dedicated to cacao by planting the hybrid beyond the area occupied by more traditional varietals.

While meeting productivity expectations in the first few years, the hybrid varietal proved especially susceptible to monilia (*moniliophthera roreri*), a fungal blight known commonly as "frosty pod" that leads to cacao pod rot. Ngobe farmers contend that when the monilia epidemic reached its full impact five years later, not only were the hybrid trees damaged but they allowed the monilia to become so virile that the more robust cacao varietals were rendered relatively unproductive as well. As a consequence, investors lost confidence in the region and the price fell

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<sup>9</sup> Owing to this, there have arisen greater arguments for jettisoning the 'community' concept in favor of multi-level institutions as organizational units in conservation (Agrawal and Gibson 1999, Berkes 2007).

to its current place at roughly fifty cents per pound making economically unviable what little productivity remained amongst the stricken trees. At present, tracts of agroforests are in a relative limbo with many Ngobe unclear as to whether or not market-viable cacao can be revived through monilia-resistant varieties, new management techniques, or a renewed investor interest in the region. In the event that cacao production is not deemed worthwhile, conversion to other land-uses (such as cattle) or outright sale are options increasingly considered by Ngobe landholders. The revival of the market viability of these cacao forests is a prominent feature in the MBC forest conservation agenda in Bocas del Toro.

Agroforestry, defined as the simultaneous production of annual and perennial agricultural crops along with timber on the same land unit (Somarriba 2001), is currently being promoted by the MBC as a mechanism of sustainable development in the region. This is done on the premise that through appropriate agroforestry systems, food and timber can be produced to meet human needs while retaining critical ecological services (Rosenberg and Marcotte 2005). Furthermore, agroforestry is promoted as a more diversified – and therefore flexible – land-use that enables the landholder to respond more easily to price fluctuations involving food crops or timber. These features have contributed to references to cacao agroforestry as “one of the most important forms of land use” in developing countries in the humid tropics (Beer et al. 1998:139).

Cacao is an understory species, requiring tree cover for optimal production (Duguma, 2001). Modern industrial cacao production has concentrated on high-yielding and short-lived shadeless systems requiring large chemical subsidies (Ruf and Schroth, 2004). In the Bocas del Toro region, cacao has long been produced by Ngobe smallholders in mixed-use homegarden or managed forest systems, with a diverse overstory of trees providing a shade canopy. It is this traditional practice of the Ngobe that MBC is attempting to bolster.

Amongst the Ngobe, cacao provides a case study that is valued in a unique set of spheres. In long-standing Ngobe practice, certain varieties of cacao are consumed daily as a basic nutriment, others are used for medical purposes and others still are used in ceremonial activities.<sup>10</sup> Only in the last century has cacao become a market commodity for the Ngobe. Ngobe-grown cacao is notable in that, for some communities, it not only resides in both market and non-market spheres, but those of the quotidian and the sacred as well.

In communities that are the target of MBC sub-project financing, preceding valuations associated with ritual practice, mundane and regular household consumption, and more recent market production are most acutely compounded by those of extra-local resource conservation agendas. Interviews of Ngobe leadership in communities receiving MBC support for cacao production demonstrated their interest in further research pertaining to cacao agroforestry, which are organized around six thematic lines: 1) Ngobe traditional and medicinal uses of cacao, 2) traditional Ngobe methods of organic production, 3) how the Ngobe can increase value-added processing of cacao, 4) global price fluctuation trends of cacao, 5) regulations around timber market access from within protected area, and 6) impacts of public and private organizations on Ngobe communities.

These thematic areas reflect market and non-market values which could have forest-conserving effects in the face of the boom and bust economic cycles that have been ecologically destructive in other cacao-producing regions (Ruf and Schroth 2004). There is also an expressed interest in not only sustainable development, but in self-determination of the forms that

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<sup>10</sup> Cf. Steinburg (2002) for a recent treatment of a similar complex of valuations amongst the Mopan Maya and Tsing (2005) for her reference to the “gap” that occurs when a forest product is valued by a community in subsistence and market spheres simultaneously.

sustainable development might take. More importantly, there is implicit recognition of the fact that such self-determination is not fully possible and that nested socio-economic and political relations are a given. These sentiments are likewise embedded in Ngobe references to their landmark political victory of territorial designation, as the beginning of an “experiment” in new forms of self-governance. Velasquez-Runk, in her studies of similarly complex relations amongst the Wounaan of eastern Panama, concludes that resource-dependent peoples tend not to be static in their articulation with shifting structures of land availability, market access and political actors and that such dynamic agency is often significantly informed by cultural beliefs and values (2007:101-102).

MBC sub-projects originate in what Escobar (1998) has termed a “globalocentric discourse” yet necessarily undergo translation as scales are transited from the transnational to the community level. Such translations include alternate framings of the MBC as ‘conservationist’ or ‘developmentalist’ as its proponents sought sanctioning from international parties concerned with problems of biodiversity loss and poverty respectively.

Ambivalence is bound up in sustainable development projects by definition. Hybrid concepts such as sustainable development and hybrid practices such as cacao agroforestry have a utility in their protean nature. They can be deployed contingently by institutions and communities in response to priorities that emerge from complex cultural calculations and shifting socio-ecological conditions. Gunderson and Holling (2001) have theoretically rendered sustainable development as a “logical partnership” of creative and conserving tendencies, rather than an “oxymoron”. However, such complicated interactions do not merely play out unwittingly in ecological and social systems. There remains a great deal of research to be done

regarding how such “partnerships” are consciously negotiated, manipulated, and interpreted in less organic contexts such as policy design and implementation, or livelihood struggles.

#### **IV. Complicating Explanation vs Simplifying Understanding**

The preceding sections in this paper explored how both cultural and biological diversity are concepts fraught with complex perspectives, contradictions, and multiple political and economic issues. The instances of complexity narrated are influenced by the dense set of interactions between bio-culturally complex communities and external actors. But as we have also shown, these systems have inherent complexity. Therefore what has changed significantly is not necessarily a characteristic of the systems—although there may be a trend towards more complexity—but our capacity and inclination to consider these systems on their own terms rather than based on simplifying conceptual frameworks. This change provides an interesting platform to consider the interaction between language and ecological diversity. It also provides a useful set of tools to reconsider our concepts about these relations.

Our case studies demonstrate that bio-cultural systems are inherently complex, and as these systems change over time, their complexity tends to increase. The disciplines involved in both ecological and cultural studies are increasingly aware of this phenomenon. Complexity is inherent in the interactions between humans, human communities and ecological systems. We propose that this complexity is a basic characteristic of the systems considered under the rubric of bio-cultural diversity. As such, complexity must be engaged in order to understand these systems, or at the very least, understand why explanations and predictions about these systems still elude us.

The issues presented in this paper—interactions, contact, language extinction not accompanied by a similar degree of cultural loss, technological evolution as a structure of cultural protection, culture and ecosystems as a political tool, differential access to resources and power, ecologically predatory practices, shifting perceptions of identity, rational and irrational management of resources, ecosystem damage, and most notably globalization—are not new, and are not the exclusive domain of western societies. Traditionally it has been proposed that resolving these issues and bringing these interactions to a manageable level will allow us to understand human-caused change in nature, and consequently, to achieve sustainability. If complexity is an inherent element of the system, efforts to simplify are unlikely to produce results. In a system that tends towards increased complexity, it is necessary to consider other avenues to achieve the goals of cultural and ecological conservation.

In the theory of Niklas Luhmann, complexity reduction is the phenomenon that social systems are exposed to greater ‘information pressure’ than they can handle in real time by rational methods. This is why they must reduce complexity which is in part done arbitrarily: A chosen action is simply just one out of a large set of similarly reasonable actions, but the very decision to chose a particular action reduces the complexity. The particular possibility, qua being realized as an action, is subsequently ascribed a higher value. Reduction of complexity is also a property of the system's own self-observation, because no system can possess total self-insight (Emmeche 1997).

The inclination to reduce complexity can also feed the need to associate areas of knowledge, as we do when we use the concepts of the biological sciences to understand social and cultural phenomena. Lacking a capacity to understand everything, as well as a capacity to accommodate all perspectives about life, and an inclination to share all the resources at our

disposal, we anchor our perspectives about the world on a limited set of principles that are intended to resolve most questions.

This paper demonstrates that revealing complexity, while exposing our ignorance of large aspects of the subjects we study, also provides a platform to consider complex sources of bias that have historically affected human relations and human/natural relations. We also make visible our converse inclination to simplify systems in order to contain them in a conceptual framework and provide coherent (if limited) explanations. When social systems, such as a disciplinary community, are exposed to greater ‘information pressure’ than they can handle in real time, by rational methods, they must reduce complexity (Luhmann [1995] cited in Emmeche 1997). The current atmosphere of information pressure challenges the disciplines involved in conservation to go beyond reductionist approaches. New epistemic paradigms have to be developed for each discipline; existing epistemic structures must be aggregated to obtain emergent capacities in interdisciplinary collaborations; and, perhaps most relevant for the context of cultural conservation, experts need to consult other non-academic epistemic paradigms such as the ones contained in the very endangered communities considered by bio/cultural conservation projects.

As this paper shows, observations of traditional practices reveal that complexity has always been inherent in the individual cultural systems, even if considered in isolation from the natural context. Integrating the element of ecosystems to our cultural considerations (and *vice versa*) provides a needed recontextualization of both culture and ecology. But it also creates a conceptual setting that goes far beyond the conceptual paradigms formerly used to understand and approach the practice of conservation. If complexity is an obstacle in developing appropriate explanations for ecological and cultural phenomena, perhaps we need to understand the

bounding principles of complexity itself in order to understand how to best approach these systems. In an interesting twist of fate, the natural sciences, which provided most of the past limiting concepts used to consider bio-cultural diversity, are now reconsidering their own presumptions and developing paradigms that account for, and attempt to study a complex and uncertain world.

As our capacity to document and share knowledge about biological systems and phenomena increases, so does the evidence that earth and most of its sub-systems are complex beyond our capacity to understand, order and predict. The last century has seen a fundamental shift in the assumptions that organize biology and ecology (Egerton 1973). Ecosystems are no longer seen as static entities in equilibrium but rather as complex systems that are dynamic and unpredictable across time and space (Scoones 1999). Equilibrium points still exist, but systems are rarely at or close to those points (Caswell [1978] cited in Rohde 2005:7). Ecological systems are also observed that evolve in non-linear, non-cyclical directions, with relatively sudden reconfigurations beyond prediction, as the component and parts mix, meld, separate, or randomly combine (Jelinski 2005: 282). Known as post-equilibrium or non-equilibrium ecology, this new perspective on science “moves beyond the Newtonian tradition of mechanistic explanation based on reductionist, controlled experimental analysis” (Holling[1993:553] cited in Scoones 1999: 494).

The post-equilibrium landscape is further complicated by the fact that complex, constantly changing and uncertain environments also allow for events of simplicity, stability and certainty. As we consider an ecosystem or an element thereof, what seems like disturbance might be an event of stability; what seems complex might be simple; and what seems uncertain might actually be very predictable. Complexity or simplicity is dependent on the interaction of the

intrinsic characteristics of a system and our capacity to gather and interpret information about the system.

W.G. Rosen once noted that in order to coin the term biodiversity, all he had to do was take the logical out of biological (Takacs 1996). This remark epitomizes the irony of increasing complexity in order to understand life better. The more complex the picture of life on earth, the closer we get to reality, but the farther we are from being able to understand reality. While adding complexity provides a more realistic context for considerations about culture, biodiversity, policy, politics and conservation, it also inescapably presents a landscape that is much more difficult to observe and synthesize, and where it is harder to generate prescriptions. By complicating rather than synthesizing, providing uncertainty in the question as well as in the answer, and making disturbance as normal as balance, post-equilibrium ecology takes us beyond the limitations of normative science (whether it is social or natural), and the limits of human knowledge.

The concepts of biodiversity, language diversity, and their integration are approximations at acknowledging complexity. The question remains if complexity is being recognized as an inherent element or as a source of disturbance. Is the cultural studies field borrowing concepts from positivist, equilibrium-based science, as our analysis suggests? We believe that the field should become self-aware about the presumptions and conceptual frameworks. What are the biases, conceptual, cultural and political that drive these endeavors? Just as natural and cultural communities are complex and exist in a complex milieu, the entities that explore these subjects and interact with these communities are complex and exist in complex settings. What steps have been taken to pair the character of the subject with the concepts and methods used to explore them?

Finally, as part of this move towards complex approaches to cultural and ecologic conservation, is it possible to reconfigure the communication between natural and social sciences, as well as academic fields and other approaches to knowledge, in order to develop a more productive set of presumptions, methods, tools for analysis and practice in the field of conservation? Although it seems counterintuitive, it might be beneficial to add rather than reduce the amount of information and complexity that is fed to this system of study. We will be no closer to understanding the whole system, but we might be able to have a richer, more inclusive, and more applicable understanding of the issues that we are able to tackle.

## **V. SUMMARY AND CONCLUSIONS**

### **1. Cultural and Biological Diversity**

We began this paper with a discussion of the basic concept of ‘bio-cultural diversity’, which is an interesting example of inter-disciplinary borrowing and combining. This borrowing has some strengths, but it also has problems. The boundaries of languages and cultures are not the same as species boundaries, for example, nor is the ‘extinction’ of languages and cultures the same as species extinction. And the practical utility of conflating biological and linguistic diversity is made evident by the counter-intuitive case of Queens, high in linguistic/cultural diversity but low in biological diversity. All of this raises the question, Why does combining diversity in both biological and cultural realms into a single metric seem like a good idea? Why does it seem to make sense? And what are its implications? Of most importance, who uses the concept of bio-cultural diversity and who doesn’t? (Who speaks, and who doesn’t?) Who benefits from its use, and who doesn’t?

These points are illustrated in the next part of the paper, in which we present a case study of language extinction among the Boruca of Costa Rica. The history of the Boruca shows the problems with measuring, and simplifying, cultural diversity in terms of language alone. The loss of language, with respect to the problems that it presents to local communities in this regard, is part of the more encompassing problem of the loss of indigeneity (Dove 2006). The formal study of a semi-lost language by community members, for example, like the formal study of semi-lost ‘indigenous traditions’, raises questions of authenticity. This case raises other questions as well: for example, are the problems with using language as the measure of cultural diversity paralleled by the use of similar measures (e.g., keystone species) for biological diversity?

We concluded this first section of our paper by looking at how conceptions of natural and cultural diversity are structured by eco-tourism, in particular by that form of it known as the ‘safari’. Drawing on field data from Tanzania, we show how the modern technology of improved roads and motorized transport affects what and how we see. The brevity of stops and overall speed of such transport helps to blur the divide between nature and culture (though this is contested by the local people), especially on primary versus secondary roads. The failings of auto safaris in this regard are reminiscent of those detailed by Robert Chambers (1983) as “rural development tourism”. More money allows for more time and nuance on safari, which raises questions about class-based variation in visions of nature and culture.

## **2. Biological Conservation and Local Culture**

We began the next major section of our paper with the concept, which has been integral to so many efforts to link natural and cultural diversity, of local knowledge of the environment.

Our purpose here was to ‘complicate’ overly-facile linkages between cultural and knowledge production. We discussed scholarly fantasies about local communities and local knowledge, and attempted to show how they can undermine the prospects for partnerships between academics and local communities.

Next we considered another example of essentializing and over-simplification, and one of the most well-known examples of the hoped for interface between culture and conservation, the ‘sacred forest’. Attention to the purported conservation benefits of sacred forests hearkens back to the neo-functionalist anthropological studies of the ecological functions of ritual in the 1960s (e.g., Harris 1966; Rappaport 1968), but it is not as informed by the intellectual progress of the discipline in the generation since. Many studies and statements about sacred forests erase both history and politics and they are still rooted in equilibrium thinking. This contradicts not only current thinking in the natural and social sciences alike, but also the local understanding of the environment in many parts of the world in terms of cyclic relations of creation and destruction.

In this section we present one more example of current efforts by conservationists to engage with local communities. A history of failures with the ‘fences and fines’ approach to conservation led to integrated conservation and development projects. Greater but still limited success with such localized interventions has led to interest in regional-scale conservation planning. Whereas much thinking about biological complexity has shifted to this larger scale, thinking about cultural complexity remains rooted at the local level. Here we examine the implications of the Meso-American Biological Corridor for an indigenous community in Panama, the Ngobe. We focus on cacao agro-forestry, which is the main focus of local-extralocal relations among the Ngobe. We ask what the implications are for bio-cultural complexity as the Ngobe abandon tradition but become more self-conscious about cultural

identity on the one hand, while on the other hand they transform an ancient tradition of cacao cultivation into an intensive and export-oriented system of commodity production.

### **3. Complicating Explanations vs Simplifying Understanding**

Much of our paper focuses on the problems of essentialization and simplification attendant upon the concept of bio-cultural diversity. In this final section of the paper, we ask to what extent this simplification is necessary for research and/or policy in this field. We suggest that such simplification promotes what we would call tractable ‘understandings’ of natural and cultural diversity, but at the price of explanations that are less representative of empirical reality. On the other hand, if we emphasize explanation that more closely approaches this reality, then understanding becomes less easy, less clear, and less ‘portable’ or shareable. This is one of the tensions inherent in the concept of biocultural diversity: namely, the tension between empirically truer explanation on the one hand and on the other hand socially useful explanation.

### **4. Concluding Thoughts**

The concept of biocultural diversity inherently raises questions about the state of relations between natural science and social science, and also between theory and practice. Questions of the relative political capital of natural versus social science are raised by the latter’s borrowing of the concept of extinction. Questions of the relative development of the theory versus practice of biological conservation and social development are raised by the routine way that theory in natural and social science alike now assumes systems in flux, whereas practice does not (*viz.*, there is a theory-practice lag in conservation and development).

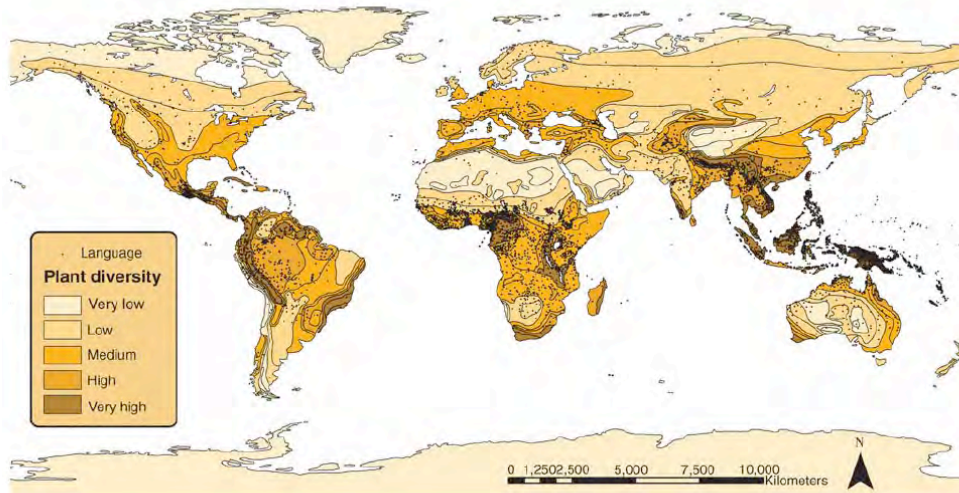
Much of our discussion was about the way that we ‘see’ nature and culture. Throughout our paper we emphasized the value of a certain amount of reflexivity. We problematized the

‘neutral’ stance of those observers who purport to stand above the fray. In the case of the concept of bio-cultural diversity, we ask what are the implicit premises about who speaks, for whom, and with what effects?

In this conference, for example, in addition to talking about the culture of ‘others’, we suggest that we also need to talk about our own academic, policy, and activist cultures. Our example of linguistic and biological diversity in Queens is an attempt to ‘repatriate’ our scholarship, to bring home our objective scrutiny to bear on ourselves. Queens is more than simply a ‘cheeky’ example. To exclude Queens (and other urban parts of the metropole), to only focus on distant, pristine environments and marginal peoples, is to make, we think, a fatal error.

Finally, in our discussion we have tried to tackle a fundamental conundrum of science and policy. We have suggested that the universal gap between the two is more than something that needs to be redressed. Rather, it exists because the two serve different needs (cf. Mosse 2004). The public versus scientific utilities of the concept of bio-cultural diversity are simply different. We need better ways of examining and explaining this difference if science is to truly inform practice in conservation and development, and vice-versa.

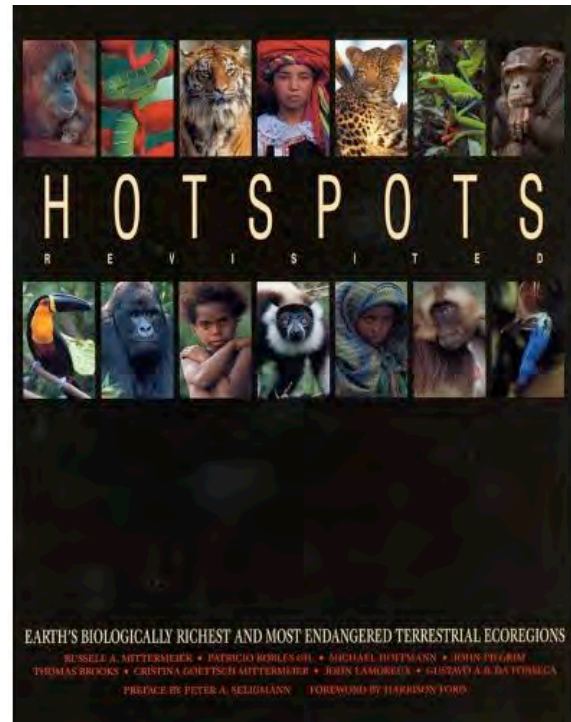
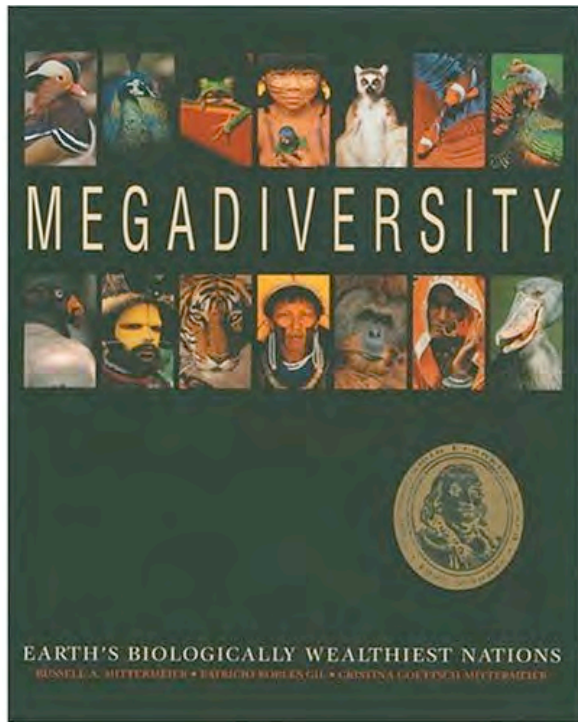
## VI. Figures



**Figure 1: Plant diversity and language distribution,**  
an illustration by Maffi (2005:617 C) based on Stepp et al. (2005)



**Figure 2: Indigenous people mapped against ecoregions**  
(Oviedo and Maffi 2000).



**Figure 3: Two 'coffee-table books' from Conservation International**

(Mittermeier, et al. 1997; Mittermeier, et al.1999)

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