

Sustaining Cultural and Biological Diversity in a Rapidly Changing World: Lessons for Global Policy

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ALVIRA, DIANA¹ and Karen Kainer²

¹University of Florida, School of Natural Resources and Environment, Gainesville, Florida, USA ²University of Florida, School of Forest Resources and Conservation, Tropical Conservation and Development Program, Center for Latin American Studies, Gainesville, Florida, USA (DCAlvira@ifas.ufl.edu)

**LIVELIHOOD SYSTEMS AND INNOVATIONS:
THEIR INFLUENCE ON NATURAL RESOURCE
CONSERVATION IN AN AMAZONIAN FOREST
FRONTIER**

Colonist farmers in Amazonian forest frontiers respond differentially to opportunities in the region they occupy by adopting a variety of land management practices and creating social institutions to support their livelihoods. Research objectives to study this phenomenon were: (1) to analyze the diverse livelihood systems in the municipality of El Chaco, Ecuador, particularly as related to conservation; and (2) to identify novel practices and initiatives in natural resource conservation. Cattle husbandry with focus on market-based dairy production dominated the agricultural systems. Almost all households were both subsistence and market-oriented, focusing on cheese, milk, beef, and two semi-perennial crops. Of these households, 75% were small-scale producers, with most farms increasingly having road access and others remote from local markets and village services. For those remote farms, at least 50% of the farm was under pasture, with the rest covered with forest and bamboo patches, and some riparian forests. In farms with road access, approximately 95% of the farm was under pasture and the rest had forest patches, scattered trees on pastures, and/or live-fences. Only 4% of all households were solely market-oriented. Half of these were large-scale producers, using improved crop and dairy farming technologies. Nonetheless, there was no evidence of farmer intent to maintain residual forest cover on their land. Local innovations identified were general conservation practices related to soil, water, and forest resources; dairy farming techniques to intensify production and enhance ecological sustainability; income-generating initiatives that promote an appreciation of local resources and production systems; and social innovations (i.e. organized environmental activist groups). The capacity to innovate must be sustained and encouraged to maintain or improve natural resource conservation strategies and social institutions to support sustainable development at forest frontier regions.

**DE LOS ÁNGELES LA TORRE-
CUADROS, MARÍA**

Herbario Forestal MOL. Departamento de Manejo Forestal, Facultad de Ciencias Forestales, Universidad Nacional Agraria La Molina. Apdo. 456. Lima 1-Perú, Tel-fax: +51-1-3493902, Tel: +51-1-4403342; Av. 8 de Octubre 184, Letra C, 2do piso, Miraflores Lima 18-Perú (angeleslatorre@lamolina.edu.pe)

**ONE CENTURY OF SCIENTIFIC LITERATURE
ON PERUVIAN AMAZONIAN ETHNICITIES**

Scientific literature that contributes to the conservation of the biological and cultural diversity in 19 linguistic families (representing 41 ethnic groups) of the Peruvian Amazon were reviewed in ISI Web of Science and Anthropology Plus (1895-2007). They revealed a total of 790 articles that reported data on Amazonian ethnicities, mainly represented by Machiguenga (103), Ashaninka (60) and Yánesha (43) [Arawaks], Shipibo-Conibo (78) [Panos] and Aguaruna (64) [Jíbaros]. The number of publications increased notably between 1970 and 1990, and a transition from linguistic to ecological themes was observed throughout the studied period. Ethnobotany publications totaled 109 and occupied the fourth position in research priority. These trends are explained with regard to the global environmental agenda, group density, geographical location, and cultural preservation, while a new field of study incorporating traditional knowledge on the management of natural resources is proposed.

**ATHAYDE, SIMONE FERREIRA
DE^{1,2}, André Villas-Bôas², Geraldo
Mosimann da Silva^{2,3}, Paulo Junqueira²,
Marcus Vinícius Chamon Schmidt², and
Katia Yukari Ono²**

¹University of Florida, Tropical Conservation and Development Program (TCD) and School of Natural Resources and the Environment (SNRE). 319 Grinter Hall, PO Box 115531, Gainesville, FL, US. 32611-5531. (simonea@ufl.edu) ²Instituto Socioambiental (ISA). Av. Higienópolis, 901, sl 30. CEP 01238-001. São Paulo, SP, Brazil. www.socioambiental.org ³University of Florida, Department of Geography. 3141 Turlington Hall, PO Box 117315, Gainesville, FL, US. 32611-7315.

POLITICAL EMPOWERMENT, CULTURAL RESILIENCE, AND ENVIRONMENTAL CONSERVATION AMONGST THE KAIABI INDIGENOUS PEOPLE IN THE BRAZILIAN AMAZON

Indigenous lands cover some 21% of the so-called Legal Brazilian Amazon, protecting areas of great cultural and biological diversity, where the lowest rates of deforestation have historically occurred. The establishment and maintenance of these lands has been possible through a combination of factors: the growth of indigenous grassroots movements, the access to financial and technical support (provided by a pool of national and international institutions), and the development of public policies. The possibility of reconciling indigenous communities' livelihoods with biodiversity conservation has had important political and economic implications throughout Latin America. In this research, we argue that long-term alliances enabling local empowerment through indigenous organizations can lead to both environmental and cultural resilience in Amazonian indigenous lands. We explore the factors enabling and constraining political empowerment amongst the Kaiabi (Tupi-Guarani) indigenous people, through a comparison between the Xingu Kaiabi, who were transferred to Xingu Indigenous Park in the 1950s and 1960s with two other groups who remained in the ancestral territory. The ancestral lands and the Xingu Park are quite different social, political, and ecological environments. Transfer to the park meant changes and adaptations in Kaiabi social and political organisation and in the access to and management of natural resources. The recently resettled Xingu Kaiabi have undergone a process of cultural and political revitalization enhanced by international funding that came to Amazonia with the environmentalist movement. They have developed strong leadership, maintaining, in an adaptive way, a repertoire of traditional practices and institutions, including their language, crop plants, material culture, as well as festivals and rituals. In an apparent paradox, Kaiabi people who remained in the ancestral lands are numerically inferior to the Xingu Kaiabi and have experienced a higher degree of assimilation into Brazilian non-indigenous society, loss of traditional knowledge, and poorer territorial control.

BABAI, DANIEL¹ and Zsolt Molnar²

¹University of Pecs, Department of Ethnography and Cultural Anthropology, Hungary (babdan@freemail.hu)

²Institute of Ecology and Botany of the Hungarian Academy of Sciences, 2163 Vacratot, Hungary

TRADITIONAL AND SCIENTIFIC CLASSIFICATION OF MOUNTAIN HABITAT TYPES IN CENTRAL EUROPE

The devastation of our natural environment has become one of the most crucial issues we face. The long-term conservation of natural resources can only be accomplished with efficient nature management. However, our knowledge is rather incomplete in this field, thus the recognition of traditional ecological knowledge must have a significant role in the conservation process. We collected ethnoecological data in Gyimes (Eastern Carpathians) by interviewing 50 people about species habitat preferences and the names of habitats. We compared the local habitat classification with our scientific one. Altogether 88 phytosociological relevés were prepared in the typical habitats of the landscape, for all we have collected the local habitat name. From the identified cca. 450 species, local people recognize cca. 60% and could name at least half of them. Local people are still using this knowledge for their survival and for the long-term use of their natural resources. We prepared a multivariate analysis based on two datasets: (1) on original phytosociological data; and (2) on a transformed dataset, where the species not separated by name by locals were merged, and species not recognized by local were deleted. Analysis shows that there is much less difference between the classifications than we expected. However, this is only valid at the level of the habitats types (finer categories, e.g., plant associations, differ more). We conclude that with the help of traditional ecological knowledge, we can gain exact, detailed, and practical information that can be used in the elaboration of future conservation management plans.

BUDEN, ALTA, Audrey Aronowsky, Darolyn Striley, Torsten Dikow, and Mark Westneat

The Biodiversity Synthesis Center, The Field Museum of Natural History, 1400 S Lake Shore Dr, Chicago, Illinois 60605 USA (abuden@fieldmuseum.org)

BIODIVERSITY SYNTHESIS MEETINGS – WORKING TOGETHER FOR DISCOVERY AND CONSERVATION

Biodiversity is a central part of human life and culture. A deeper understanding of biological diversity and its relation to cultural diversity will encourage conservation by allowing for informed decision-making by governments, conservation organizations, and the public. The Biodiversity Synthesis Center (BioSynC)

of the Encyclopedia of Life (EOL) helps to facilitate scientific discovery in biodiversity, and the conservation of biodiversity by hosting synthesis meetings. Funded by the MacArthur Foundation, synthesis meetings for the EOL can bring together experts on biodiversity and conservation biology (biologists, land use managers, computer programmers, artists, and policy makers) to encourage dialog, group understanding, and progress towards specific goals. Synthesis meetings develop new ways to use the growing Encyclopedia of Life for scientific discovery such as novel research questions in biogeography, conservation, evolution, visualization of large data sets, and study of biodiversity hotspots. In addition, EOL synthesis can help to highlight public benefits to informatics such as new educational materials and citizen science approaches. Recent synthesis meetings have focused on megadiverse and understudied taxa (for example the Phylum Bryozoa) and brought together software engineers, programmers, and systematists to create a new visual interface for the Tree of Life. Synthesis meeting topics are proposed by the scientific community to assemble novel and complimentary groups of people addressing central questions in biodiversity and conservation. The integration of cultural, linguistic, and biological diversity represents an ideal avenue for future synthesis meetings and for using the multi-lingual EOL. We hope to host meetings on this topic and welcome proposals in the coming year.

CHANG, VERA and Susan Opotow

¹Carleton College, 300 North College Street, Northfield, MN 55057, USA ²John Jay College of Criminal Justice, CUNY, 899 Tenth Ave, New York, NY 10019, USA (changv@carleton.edu)

CONSERVING CHARISMATIC MEGAFUNA: ENVIRONMENTAL IDENTITY AND INCLUSION IN NAMIBIA

According to Fuller (2005), a person's "idea of an elephant is bound to change depending on whether he experiences the animal at the end of a telephoto lens, the end of a millet pot, or as a weekly stew." This research, conducted in the Kunene Region of Namibia, looks at the conservation of charismatic megafauna, large mammals with widespread appeal such as elephants, lions, rhinoceros, and cheetahs. These species are especially vulnerable to extinction because of human activities and habitat destruction. Because people with different needs and experiences might see charismatic megafauna and their conservation quite differently, we examine two groups (North Americans and Namibians) in a small settlement in an arid area rich with wildlife. These

qualitative data describe our respondents' (N=12) environmental beliefs, attitudes, and values, focusing particularly on their: 1) extrinsic or intrinsic valuing of nature, 2) environmental identity, and 3) inclusion of nature (and various aspects of it) within their scope of justice. Our findings indicate that: the attitudes and values of these groups differ; context informs the thinking and conservation strategies of each group; and social and environmental justice are clearly linked. We argue that local values and knowledge are a crucial component of environmental conservation and need to be included in the design and implementation of environmental protection policies.

CHRISTIE, MICHAEL¹ and Helen Verran²

¹Charles Darwin University, Northern Territory, Australia

²University of Melbourne, Victoria, Australia

SUSTAINING BIOLOGICAL AND CULTURAL DIVERSITY IN REMOTE ABORIGINAL AUSTRALIA: THE EMERGING ROLE OF DIGITAL TECHNOLOGY

Researchers from the Charles Darwin University and the University of Melbourne have been working with Yolngu Aboriginal people in Arnhemland, northern Australia for more than twenty years, on projects to do with language, philosophy, education, technology, and sustainability. In our work we take seriously Yolngu philosophy in which there is no a priori split between the "natural" and the "cultural." Sustaining cultural and biological diversity has always been a "natural" outcome of sustaining the creative practices of knowledge production.

There are many Yolngu clan groups, each associated with a particular set of estates, languages, and species left behind by the creative journeys of the ancestors.

Knowable reality continues to be emergent, its structures, processes, and meanings always renegotiated and renewed in the everyday practices of life "on country," as well as through secret/sacred religious practice. Metaphysics is a routine task of daily life. Knowledge is not seen as something that can be commodified and stored in a database, but as performative, social, and embedded. The work of digital technologies (cameras, recorders, computers, DVDs and so on), as they are taken up in Aboriginal communities, is to maintain that fluid search for an informed way forward, and

to resist the received understanding of truth as representation, which is hidden embedded in conventional data base systems.

This poster focuses upon two key aspects of our work: the development of ontologically “flat” software systems that avoid any split between biological and linguistic/cultural phenomena, and the search for hardware, software, and connectivity that enhance the fluid, social, localized knowledge production practices upon which Aboriginal cultural and biological sustainability depend.

D’AMICO, LINDA, Carlos Zorrilla, and Mary Ellen Fieweger

¹Winona State University, P.O. Box 5838 Winona, MN 55987 USA; ²DECOIN (Defensa y Conservación Ecológica de Intag/Ecological Conservation and Defense of Intag), Casilla 18, Otavalo, Imbabura Ecuador; Periódico INTAG, Apuela, Imbabura, Ecuador (ldamico@winona.edu)

COTACACHI (NW ECUADOR) AS THE FIRST ECO-CANTÓN IN LATIN AMERICA: INTAG AS AN EXAMPLE AND CHALLENGE FOR THE 21ST CENTURY

Intag is an important example of how biodiversity became a global concern and how cultural plurality and self-determination have become political issues over the past decades. Due to the relative remoteness and ruggedness of its Andean landscapes, until recently Intag was considered by elites a social and political backwater, a kind of frontier and forgotten geography on the periphery. The human settlements (approximately 13,000 people) are ethnically diverse, sparse, and not easy to reach. In recent years, Inteños have become entangled in different models of development and innovative alternatives. On the one hand, ecologists identify Intag as part of the Chocó-Darien region, renowned for its mega-diversity and designated as one of the ten most important “hotspots” for conservation on the planet. It has one of the highest rates of endemic species where jaguars, ocelots, spider monkeys, Andean spectacled bears live in the cloud forests, in addition to myriad other creatures from the plant and animal worlds. Our poster examines how the relationship between men and women and their environment is constantly being renegotiated through the call for social rights (including water security, food security, and economic survival), and in resistance to the proposed transnational copper mining in the region. We explore the coalitions formed and processes engendered through various media and alternative projects, which created a feedback loop as Inteña/

os interpreted different kinds of knowledge and engaged in a global conversation about conservation, sustainability, and self-determination. The formation of an Ecological County or Eco-Cantón in 2000 demonstrates how a multi-ethnic population came up with innovative and inclusive alternatives for sustainable development. The democratizing processes that made the Ecological Ordinance possible are linked to civic participation, the role of NGOs and the interconnection of different groups through media—all of which is instructive to the global community.

DOMROESE, MEG, Christine Engels, Katherine E. Holmes, and Daniel R. Brumbaugh

Center for Biodiversity and Conservation, American Museum of Natural History, New York, NY, US (domroese@amnh.org)

DRAWING ON BIOLOGICAL AND CULTURAL LINKAGES TO PROMOTE MARINE CONSERVATION IN THE BAHAMAS THROUGH EDUCATION

*Education is critical for management of marine protected areas, particularly where resources for enforcement are limited and local communities largely determine compliance with regulations. The Bahamas initiated one of the world’s first networks of marine reserves in 2000. This designation provided researchers with an unprecedented opportunity to analyze the physical, biological, economic, and cultural processes affecting reef systems across seascapes, and to integrate these aspects into recommendations for conservation strategies. Building on the resulting Bahamas Biocomplexity Project, the American Museum of Natural History’s Center for Biodiversity and Conservation also collaborated with Bahamian partners on conservation education approaches, including the recently published *Treasures in the Sea*, a guide that provides educators with scientific information and engaging, hands-on activities that encourage students to discover, cherish, and protect the marine environment. The process of developing this resource involved a survey of existing educational materials, consultation with scientists about concepts to cover and accuracy of information, as well as extensive discussion with teachers to adapt activities for the Bahamian context and ensure that educational goals are addressed. Activities center on three species of cultural and economic importance in The Bahamas (Nassau grouper, queen conch, and spiny lobster) and provide a vehicle to address the urgency of management for*

fisheries sustainability. Important connections are also made with livelihoods in tourism, an industry fundamentally linked with the natural environment and that accounts for 60% of the country's GDP. Following initial training in July 2007, teachers have led workshops for others in their schools and are implementing activities with students. Building on formative evaluation results from the workshops and an independent environmental education review team, we are collecting feedback from teachers in The Bahamas as they implement activities with students to examine teaching and learning outcomes.

GOLDMAN, HELLEV.¹ and Martin T. Walsh²

¹Norwegian Polar Institute, Polar Environmental Centre, NO-9296 Tromsø, Norway ²Department of Social Anthropology, University of Cambridge, Free School Lane, Cambridge, CB2 3RF, United Kingdom (goldman@npolar.no)

WHEN CULTURE THREATENS THE CONSERVATION OF BIOLOGICAL DIVERSITY: THE TRAGIC CASE OF THE ZANZIBAR LEOPARD (PANTHERA PARDUS ADERSI)

The West's pervasive conservation ethic glorifies charismatic large animals, including predators, and prominent "flagship species" are often used to promote the conservation of biological diversity in general. However, people in undeveloped rural communities whose lives and livelihoods are threatened by such animals may have a very different understanding of their value and how they should be dealt with. The authors, both anthropologists, examine indigenous knowledge and local practices relating to the Zanzibar leopard (Panthera pardus adersi), which is (or was) a little-known subspecies endemic to the main island of the Zanzibar archipelago, Tanzania. Rapid population growth and the expansion of farming in the 20th century destroyed leopard habitat and decimated their natural prey, bringing them into increasing conflict with people. Villagers responded by initiating campaigns designed to exterminate leopards and punish the witches believed to be using them to attack people and their livestock. Officially sanctioned leopard killing continued into the 1990s, by which time some international authorities had declared the Zanzibar leopard extirpated, though Zanzibaris themselves continue to allege their presence. We argue that this case raises uncomfortable questions about the effectiveness of orthodox conservation initiatives when human-wildlife conflict

is compounded by conflicting scientific and indigenous knowledge about endangered species. This underlines the importance of bringing both natural scientific and social scientific approaches to bear on difficult cases in which the conservation of biological diversity and respect for cultural diversity clash with one another.

HANSTEEN-IZORA, ROBIN, Paul Rankin, and Nicolas Villaume

LIVING CULTURAL STORYBASES: A DIGITAL INITIATIVE FOR NURTURING THE ORAL HERITAGE OF THE WORLD'S TRIBAL COMMUNITIES

The 370 million indigenous peoples represent only about 5% of the Earth's population but more than 1/2 of the intellectual legacy of humanity—its languages and cultures. Yet it is these same people who are the most marginalized, fractured, and least represented in global society: they are virtually being swept away by poverty, disease, conflict, and land appropriation. For every group dispossessed, urbanized, or assimilated, a culture vanishes, taking with it ancient knowledge of the environment, unique ways of living, alternative belief systems, irreplaceable skills, artistry and stories—the rich diversity of humanity. This is a tragedy not only from a cultural perspective, but from a biological one as well. In forgetting the thirteen names an Eskimo may have for snow the world does not just lose words, it loses intimate, detailed knowledge of a part of the world's ecology and ways of interacting with that ecology that have been both respectful and balanced. Up until now, the digital revolution, rather than creating a "global village," has accelerated this worldwide cultural demise. Yet these same technologies causing the "digital divide" could nurture indigenous languages and cultures. In the past ICT initiatives have addressed the immediate developmental needs, rarely even acknowledging minority languages or traditions. "Living Cultural Storybases" seeks to go further: facilitating appropriate, two-way access for all community members to gather and share cultural knowledge through spoken stories. Living Cultural Storybases are vibrant and accessible evolving digital repositories of cultural information that offer a means to gather, search, connect, and access the cultural life of a community. Through current research projects active in Timbuktu, Mali, and the Peruvian Andes this work seeks to develop an appropriate, scalable, and participatory model for using ICTs to nurture intangible heritage.

KUMAR, SATISH

Resurgence Trust, Ford House, Hartland, Nr Bideford,
North Devon EX39 6EE, UK (satish@resurgence.org)

FROM OWNERSHIP TO RELATIONSHIP

Is there a relationship between chronic poverty, the decline of bio-cultural diversity, and the ownership of the world's natural resources by the few? Yes, most of the world's poor have no direct access to land, forests, or fishing; these natural resources are owned by the wealthy monoculture classes. How can we own nature? It is a gift—and should be equally accessible to all. Animals do not need money to buy their food and water, only humans. There may be mountains of food rotting in warehouses to maintain market value, but if humans have no money they can have neither food nor water. We have built a system that turns food and water into commodities bought and sold with money. Money is supposed to be a medium of exchange, but in reality it has become the ruler of our lives and as it is always kept in short supply, there are always people who do not have enough and therefore have no guaranteed provision of food and water. Thus the monoculture of money is an obstacle to bio-cultural diversity. Poverty is not a natural phenomena, it is a result of human design. Fighting poverty has become big business—a way for those with money to generate more. For the past sixty years governments have talked about reducing poverty. However, in spite of all the rhetoric the poor get poorer and the rich get richer and the natural world is diminished. Therefore the urgent challenge facing the world is not to give more to the poor, but to take less from the poor. We need to move away from ownership of nature to having a relationship with nature so that all cultures can be self-sustaining and self-organizing.

**LAW, WAYNE¹, Fanston Marcus²,
Carsina Tauling², and Michael Balick¹**

¹The New York Botanical Garden, Institute of Economic Botany, 200th St. and Kazimiroff Blvd, Bronx, New York, US

²Kosrae Conservation and Safety Organization, Kosrae, Federated States of Micronesia (wlaw@nybg.org)

**USE IT OR LOSE IT: THE LINK BETWEEN
CULTURE AND PLANT DIVERSITY IN KOSRAE,
FEDERATED STATES OF MICRONESIA**

The most serious threat to biodiversity has been attributed to the introduction of exotic species, overharvest, habitat loss, and

climate change. However, the loss of a culture or even parts of a culture should be recognized as detrimental for species and varieties that are unique to an area. In Kosrae, the easternmost Micronesian island, we compared the knowledge of useful plants for men and women of three different age classes (20–39, 40–59, 60–79) to a list of traditionally used plants recorded during the Dr. E. Sarfert 1908–1910 South Seas Expeditions. The results of our study revealed that in almost 100 years, many of the plants identified during the initial expedition are not remembered by the oldest generation. More alarming is the current lack of transmission of plant knowledge from the oldest generation to younger generations. This loss of culture consequently results in loss of plant diversity. Plants unique to Kosrae will be lost if not maintained through cultural transmission. These native plants may also become vulnerable to invasion by introduced varieties. Thus, a plant may still grow in a region such as Kosrae, but if culture fails to deem it essential, it will remain unrecognized as if extinct. This study illustrates how plant diversity is intimately connected to cultural diversity. It further emphasizes that we need to sustain traditional knowledge in order to preserve culture, as well as protect biodiversity.

**MADEGOWDA. C¹, Siddappa Setty R.¹,
and Nitin D. Rai¹**

¹Ashoka Trust for Research in Ecology and the Environment, # 659, 5th 'A' Main Road, Hebbal, Bangalore-560024, India (cmadebrt@yahoo.co.in)

**THE ROLE OF SOLIGA TRADITIONAL
KNOWLEDGE AND CULTURAL ECOLOGY IN
BIODIVERSITY CONSERVATION IN BILIGIRI
RANGASWAMY TEMPLE WILDLIFE SANCTUARY,
INDIA**

Soligas have farmed and configured the forests of the Biligiri Rangaswamy Hills (BRH) for centuries. The high levels of biodiversity in the BRH have been maintained by Soliga forest management systems such as regulated fire use and swidden cultivation. Contemporary conservation efforts do not acknowledge this history of forest use or the traditional knowledge of Soligas. Soligas have maintained a continuous interaction with the forest, deriving basic requirements such as food from the forest. Soligas practiced shifting cultivation until the BRH was declared a wildlife sanctuary in the 1970s when they were displaced, sedentarized, and marginalized. The collection of non-timber forest products was their main source of cash income until

2005 when an amendment to the national wildlife law banned the collection of forest produce by local communities. India's biodiversity conservation policy has neglected local knowledge and invisibilized traditional communities. Such exclusion is based on the belief that all human use is inimical to biodiversity. Using ethnographic information on Soliga cultural ecology, we argue that an inclusive conservation strategy should be evolved. We obtained detailed information through focus group discussions, informal discussions, oral histories, mapping of sacred sites, and workshops on collaborative management efforts under current devolutionary policy frameworks. Soligas used and farmed the forest in well-established spatial configurations based on clan boundaries. Their practice of shifting cultivation and the use of early season fires within these boundaries demonstrates that Soligas have managed and transformed the BRH landscape. Their understanding of ecological processes that structure the forest has enabled them to explain current forest dynamics and predict ecological outcomes of contemporary state-driven fire suppression regimes. Our experimental results confirm these patterns. Such intimate knowledge of forests should be incorporated into forest governance systems that not only privileges traditional cultural ecologies but also ensures democratic and socially just conservation strategies.

MCGINTY, MEGHAN

Department of Ecology, Evolution and Environmental Biology, Columbia University, New York, NY 10027, USA, (mmm2196@columbia.edu)

ETHNOBOTANICAL KNOWLEDGE AND THE CONSERVATION OF INDIGENOUS TREES IN TROPICAL AGROFORESTRY OF SOUTHERN BAHIA, BRAZIL

The objective of the pre-dissertation research was to obtain data on the relative importance of different agroecological, cultural, and political factors on indigenous tree management in agroforestry. Humans have intensified agroforestry systems across the most biodiverse tropical forest landscapes. Agroforestry intensification usually comes in a loan-subsidized, agronomic package of species, inputs, and agroforestry practices. Indigenous tree management in agroforestry is at risk of being replaced by exotic tree species and more economically profitable systems. Interviews and observations were conducted with a sample of farmers (n=44) and their agroforestry systems from the biodiversity hotspot of Atlantic Rainforest in southern Bahia, Brazil. Data was collected regarding contact with government agencies, land tenure, agricultural production, tree species, and management

practices. The majority of farmers prefer indigenous trees for their timber and other edible and medicinal uses. Farmers with more ethnobotanical knowledge of indigenous tree species are more likely to conserve those species through managing their natural regeneration. The persistence of indigenous tree species in agroforestry is related to the persistence of ethnobotanical knowledge and natural regeneration management of indigenous tree species. Therefore, the conservation of ethnobotanical knowledge regarding indigenous tree species is essential to the conservation of the species in agroforestry systems.

MOLNAR, ZSOLT¹ and ²Daniel Babai

¹Institute of Ecology and Botany of the Hungarian Academy of Sciences, 2163 Vacratot, Hungary (molnar@botanika.hu)

²University of Pecs, Department of Ethnography and Cultural Anthropology, Hungary

LIVING PRE-INDUSTRIAL RURAL VEGETATIONAL KNOWLEDGE IN CENTRAL EUROPE (EASTERN CARPATHIANS)

In Europe the present knowledge of botanists, ecologists, nature conservationists, farmers, and foresters seems to be insufficient for reliable planning and realization of landscape and nature conservation management. One reason for this is that we know little about the traditional relationship between nature and man. Although traditional rural knowledge is decaying rapidly with modernization, it still exists in Central Europe. It exists in such a quantity that there will not likely be enough botanists in our countries to collect, "sustain," and use the related scientific botanical knowledge, which is commensurable in quantity to traditional local knowledge. In our studies our goals were to collect this knowledge in an ethnographically special Hungarian community living in the valleys of the Carpathians in the spruce zone. We described the present and historical vegetation and land use of the area, studied some adequate aspects of the culture, and collected the vegetation and landscape knowledge of local people through semi-directive interviews, questionnaires, and also by living among them for several months during the last nine years. Our results show that the local community recognizes more than 200 plant species (out of cca. 450); one person can name and describe around 100-150. They can describe their soil and habitat preferences, and distinguish specialists, generalists, and indifferent species. Edaphic habitats are named after their soil properties, habitats with deep soil by the dominant species or the land-use type. The botanical knowledge of the studied community is much larger and more relevant than was expected. We argue that only a trained

botanist can accomplish an effective collection of traditional rural vegetational knowledge. If botanists do not undertake this job we will have to rely upon the collections of ethnographers and probably would not notice accidental false data, misconceptions and, particularly, thematic and lexical gaps in the collection.

ORMSBY, ALISON

Eckerd College Environmental Studies, St. Petersburg, Florida US (ormsbyaa@eckerd.edu)

SACRED FORESTS OF GHANA AS RESERVOIRS OF CULTURAL AND BIOLOGICAL DIVERSITY

Formally recognized protected areas are inadequate as a sole method of biodiversity conservation. Alternative approaches are necessary. Sacred forests are areas that have cultural significance to the people who live around them. Because sacred forests tend to be small, they are often isolated habitat fragments surrounded by agricultural lands. These fragments sometimes represent the last locations in certain regions with potential for biodiversity conservation, yet are not recognized in terms of official legal protection. Ghana has a long history of community protection of sacred sites. Research at Tafi Atome Monkey Sanctuary and Boabeng–Fiema Monkey Sanctuary revealed contrasting histories of resource management and cultural traditions. A qualitative, ethnographic research methodology was used, including semi-structured, open-ended interviews. The history of each site, rationale for its protection, taboos relating to natural resource use, and ecological management techniques were investigated. Results indicate that management approach, level of community involvement, and ecotourism profit sharing are linked to effectiveness of site protection and community attitudes. Both sites have a long history of resource protection associated with beliefs that local monkeys are sacred, with related taboos on hunting. Both sites have faced erosion of traditional resource protection customs due to missionary influences. Long-term government involvement at one site and community conservation at the other present contrasting challenges for the future viability of each forest in terms of tourism, local participation and management, as well as preservation of cultural traditions and biological diversity.

PEDONE, GIULIA

University of Siena, Italy (giuliapedone@yahoo.it)

INDIGENOUS AGRO-FORESTRY AGENTS, STATE OF ACRE, BRAZIL

Over the last ten years significant progress of agro-forestry management by indigenous people has taken place in the western Amazon region of Brazil (State of Acre). Thanks to the technical support of the Comissão Pró-Índio do Acre NGO, 126 Indigenous Agro-Forestry Agents (IAFAs) from 11 different indigenous territories have been trained on issues related to Natural Resource Management, and have benefited from exchange visits. IAFAs are mostly male youths from indigenous communities who play a key role in developing several activities on their own land, such as agro-forestry system management, palm plantation, hunting and fishing, and through mapping and zoning of their territories, recovering degraded areas, documenting communal practices and activities, recycling wood for sculpture and furniture, and managing garbage (organic/not organic). The educational training program aims to integrate indigenous ecological knowledge with scientific knowledge in order to create an intercultural dialogue through which the livelihood standards in indigenous communities are improved. IAFAs are authors of several textbooks and didactic posters concerning environmental themes, in which they express their traditional knowledge in maternal language and Portuguese, as well as the new information acquired during courses; these are used in schools in indigenous lands. This material is relevant for two main reasons: it is a powerful tool for the diffusion and promotion of indigenous languages, in areas where the practice of the maternal language is regressing, and it is also a vehicle for sharing natural resource management knowledge. Over the course of the last few years, IAFAs have created an Association through which they negotiate with the government and with local institutions on public policies related to environmental issues. Through their work, IAFAs strengthen indigenous environmental knowledge, and contribute to maintain the biodiversity of their lands; for these reasons, IAFAs are demanding to be recognized as “guardians of the forest.”

PATRICIA PINTO DA SILVA¹, Laura Orleans², and Susan Abbott-Jamieson³

¹NOAA Fisheries, 166 Water Street, Woods Hole, MA 02536 US ²Working Waterfront Festival, New Bedford, MA, US ³NOAA Fisheries, Silver Spring, MD, US

VOICES FROM THE FISHERIES: CREATING AN ON-LINE ORAL HISTORY ARCHIVE

Many oral history projects documenting the commercial fishing industry have been implemented in the Northeast US. Some of these have been carried out by NOAA Fisheries and others by project partners such as the Working Waterfront Festival in New Bedford, MA and Rutgers University. The histories are scattered throughout the region (and country) with no central repository making them difficult to access and diminishing their usefulness. This paper describes an effort to consolidate, archive, preserve, and share these oral histories. Consolidating these collections in a single web-based archive will help protect them while enabling researchers and others to access a much larger body of data. The project will enhance the existing collections by creating full electronic written transcripts as needed (many are already transcribed) using a standardized format and key word coding them so that once added to the archive, they can be searched by various key words. In the absence of such an archive, these individual collections will remain inaccessible and underutilized. This project will enable these individual existing efforts to make a long term impact on the preservation of national heritage as it relates to the human dimensions of fisheries management and coastal communities. The paper will describe this on-going project as well as the collections that have been identified for inclusion.

ROGERS, ELIZABETH and Lawrence Daniels

Forest County Potawatomi Community, Natural Resources Department, Crandon, Wisconsin, USA (elizabethr@fcpotawatomi.com)

GTE GA NĒS: A TRADITIONAL ECOLOGICAL KNOWLEDGE PARADIGM FOR POTAWATOMI BIODIVERSITY CONSERVATION

As indigenous peoples worldwide assert sovereign rights to lands and cultures, traditional ecological knowledge (TEK) increasingly is recognized for the role it plays in biodiversity conservation. Using just such a TEK paradigm, the Forest County Potawatomi Natural Resources Department is building a land management process aimed at restoring vital relationships between the people and their lands. This federally recognized tribe descends from bands who resisted westward removal by the federal government in mid 1800s. They settled on lands in northern Wisconsin in loosely assembled clusters of families on home sites connected by

traditional trails and camping places. Their families continued with their traditional agriculture of Gte Ga NĒs ("little gardens") whereby plants for foods, ceremonials, and medicines were planted around home sites, along trails, and in forest clearings. These gardens meant cultural and physical survival to a people continually threatened with displacement. Today, most members live in communities but the landscape still holds their history in house foundations, old trail traces, and significant natural features. In addition, plant species brought north from the prairie during historical movements are distributed in patterns reflective of familial settlements. This botanical biodiversity provides a living continuous record of the Tribe's history. The Gte Ga NĒs TEK paradigm aspires to perpetuate cultural and biological diversity by reviving familial ties to the land. This process is facilitated through the creation of a dynamic temporal-spatial inventory of cultural and biological diversity using geographical information system (GIS) technology. In addition, involved Tribal members will assist scientists in identifying opportunities for restoration and protection. Also critical is the way that a TEK paradigm can reconstruct interactions with federal agencies holding trust responsibilities. The Gte Ga NĒs can again prove vital to the survival of the Potawatomi people by restoring and perpetuating invaluable relationships between culture and biodiversity.

VANDEBROEK, INA¹ and Michael J. Balick¹

¹Institute of Economic Botany, The New York Botanical Garden, Bronx River Parkway at Fordham Road, 10458 Bronx, NY (ivandebroek@nybg.org)

CULTURAL TRADITIONS IN MODERN TIMES: HOW MIGRATION TO NEW YORK CITY AFFECTS KNOWLEDGE OF MEDICINAL PLANTS FOR TRADITIONAL HEALTH CARE IN DOMINICAN IMMIGRANTS

One of the apparent links between cultural, biological, and linguistic diversity is the use of herbal remedies for health care by different ethnic groups. Previous studies in the Dominican Republic (DR) have shown that Dominicans have a rich tradition of using medicinal plants, and for particular illnesses this cultural practice is even preferred over biomedical care. The number of Dominicans immigrating to New York City (NYC) has increased exponentially over the past decade and so far only very few studies have documented the impact of migration on Dominican medicinal plant knowledge and procurement of

plant source material. The main objective of the present urban ethnomedicine survey was to: record knowledge of herbal remedies among Dominican immigrants in NYC; identify Dominican beliefs, attitudes, and practices in relation to illness and their use of herbal remedies; and investigate the botanical identity and procurement of medicinal plants. As a basis for comparison the same survey was undertaken in the DR. The results show that, although first generation Dominican immigrants in NYC have a similar breadth of medicinal plant knowledge as their peers in the DR, a decline was observed in their knowledge about plants that are procured from the wild, imported to NYC, and frequently sold there in specialized community-based healing shops (called "botánicas"). Our study also showed that younger Dominicans in NYC tend to possess less medicinal plant knowledge. To date, the practice of purchasing plants from botánicas remains relatively common in first generation immigrants who use medicinal plants for health care. These plants are often imported straight from the DR or from other countries, and some are obtained from within the United States because of importation regulations. The fact that knowledge about certain plant species is declining may significantly affect the preservation of this important cultural tradition in the long term.

VARGA, ANNA

MSc Student of Biology at the Eötvös Loránd University, Budapest 1114 Pázmány P. sétány 1/c; Hungary (varga.anna@gmail.com)

HISTORICAL AND RECENT VEGETATION DYNAMICS OF WOOD-PASTURES IN THE CARPATHIAN-BASIN (HUNGARY, ROMANIA)

A knowledge of previously used traditional methods is of great importance in environmental protection. The traditional use of woodlands and its essential influence on the land's structure and dynamics have become commonly known among the Hungarian ecologists only in the past few years. The decrease of land use diversity is leading towards a homogeneity of the vegetation structure. This study has commenced with the research of landscape history, and an analysis of woodlands in 4 different regions of the Carpathian-basin. Woodlands studied: oak-hornbeam-beech woodlands in Bakony (Hungary) and in the hills of Homoród (Romania); and spruce woodlands of the Gyimes-valley (Romania) and the mountains of Csík (Romania). Getting better informed about the use of woodlands for pasture and the past landscape, ethnographical, historical descriptions were collected as well as descriptions concerning the forests. Archives,

aerial photographs, handwritten maps, ordnance maps referring to each chosen area's history were analysed. Locals and shepherds were interviewed. The stand structure was described with the wood-species composition, canopy closure, and diameter at breast height and height of trunk between field and crown. In all cases the wood-pasturing was one of the basic components of a highly varied pasturing system; the whole activity was regulated. In all cases the decrease of livestock was the reason for the abandonment of the areas. A consciously controlled and sustained landscape of woods evolved as a result of woodpasturing in all of the analyzed fields. In case of abandoning bushy shrubbies, saplings filled, low-diversified, closed shrubbies and woods were developed. The paper suggests that the decrease of diversity could be inverted by a nature conservation treatment regenerating traditional land uses. Due to its positive developmental effects, this type of land usage could be considered for support by the Agricultural and Rural Development Programme of the EU in Hungary.

WOOD, W. WARNER¹ and Clement Otu-Tei²

¹Department of Anthropology and Museum Studies, Central Washington University, Ellensburg WA, U.S.

²Resource Management Program, Central Washington University, Ellensburg, WA, U.S. (woodw@cwu.edu)

LOCATING THE LIMITS OF AN ECOTOURISM/ CORAL REEF COMMUNITY: STRATEGIES FOR HUMAN/NATURAL SYSTEMS FIELD RESEARCH AT LAS BAHÍAS DE HUATULCO, MEXICO

At an ecotourism resort where a variety of businesses may employ workers and bring products (and materials) from a wide variety of locations, and where visitors may include distinct "visiting publics," determining the limits of the "human systems" impacting the environment on which the resort depends is an international undertaking. This poster examines these issues for the case of coral reefs in and near Las Bahías de Huatulco Resort on the Pacific Coast of Oaxaca, Mexico. The coast of Oaxaca is biologically diverse and, seen from the perspective of ecotourism developers, holds great promise for the variety of terrestrial and marine resources that could be the focus of unique visitor experiences. Conceived initially as a "second Cancun" and focused on several small bays developed to different degrees (some bays are never to have road access while others have five-star hotel complexes), planning for the Huatulco Resort shifted dramatically in the late 1990s coinciding with an international move toward

sustainable development models in the tourism sector. This shift has included the establishment of a national park encompassing several of the bays and an emphasis on hotels and other businesses that have a smaller environmental footprint, among other changes in business practices. This poster compares and contrasts a variety of field research strategies that hold significant promise for capturing the complexity and extent of the social systems implicated in the management of the area's coral reefs including: Actor Centered Network Theory (as pioneered by Bruno Latour), Multi-Sited Ethnographic Research (as outlined by George Marcus), and Michael Burawoy's Extended Case Method. These research strategies are compared for their strengths and weaknesses for the purposes of evaluation and future application to natural resource management practices on the Oaxacan coast.

area such as Mole where local people have been displaced, the question becomes one of cultural conservation. How are the cultural practices, beliefs, and knowledge of surrounding communities, which were at one time closely interwoven with local biodiversity, affected? Interviews with community members around Mole National Park provide some answers to this dilemma and provide insight into the paradox of biodiversity conservation that excludes the human cultural element.

WOODLEY, ELLEN¹ and John Mason²

¹Terralingua, Canada ²Nature Conservation Research Centre, PO Box KN925, Kaneshie, Accra, Ghana

CULTURAL CONSERVATION IN DISPLACED COMMUNITIES AROUND MOLE NATIONAL PARK, GHANA

*In efforts to integrate poverty alleviation with the conservation of cultures and biodiversity, ecotourism is seen, by some organizations, as a way to provide both an income and incentive for conservation. In the West African country of Ghana, there have been successful initiatives to protect a variety of valued species using local cultural norms as the basis of protection. The Nature Conservation Research Centre (NCRC) is a Ghanaian non-profit voluntary organization that combines conservation initiatives with ecotourism to encourage protection of Ghana's natural, historic, and cultural diversity. An example of a successful NCRC initiative is the Boabeng-Fiema Monkey Sanctuary, which is a chain of culturally protected sacred groves with resident primate populations of 200 Geoffroy's Pied Colobus (*Colobus vellerosus*) and 500 Campbell's Mona monkeys (*Cercopithecus mona campbelli*). Continued protection of these monkeys is based on a local taboo that prohibits anyone from harming them. The sanctuary is considered one of the best examples of indigenous conservation in Ghana today.*

Contrasted with this are Ghana's government protected National Parks where human use and influence have been minimized. Mole National Park is Ghana's premier wildlife park located in a savanna ecosystem, inhabited by a diverse range of large mammals, primates, and birds. In a protected