



Naturalness Is in the Eye of the Beholder

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World conservation discourse concentrates on forests of high naturalness, which are variously termed intact forest landscapes, primary forests, pristine forests, and wilderness. In this essay, we bring Amazonian Indigenous perspectives to this discussion, both because Amazonian Indigenous Peoples have the right to be in the discussion and because they have a lot to teach us about naturalness. It is essential to understand that Indigenous ontologies do not distinguish culture from nature, since all beings, humans and non-humans, are part of a network of social-ecological interactions. Hence, forests are not natural, but the domus of different beings who inhabit, care for and cultivate them. Each part of the forest mosaic in different stages of social-ecological succession has different owners: when people open swiddens, they must respect other – non-human – forest residents to do so, and when they fallow their swiddens, these other forest residents reassume their original roles as managers and conservers of that part of the mosaic. Each stage of the succession also contains cultivated and domesticated plant populations, so we can think of a different kind of conservation: that of genetic resources. From this perspective, swidden-fallow represents on farm conservation, while less anthropogenic parts of the forest mosaic represent *in situ* conservation. We believe that reframing forest conservation and learning from Indigenous People can inspire innovative conservation science and policies.

Keywords: cultural forests, genetic resources conservation, *in situ* conservation, indigenous knowledge, Native Amazonian ontologies, Nature/Culture dichotomy, on farm conservation, social-ecological relations

INTRODUCTION

Forests of high naturalness are major topics in world conservation discourse because they are assumed to contain more biodiversity and offer more ecosystem services than less natural forests (Watson et al., 2018; Fa et al., 2020). Forests of high naturalness are variously termed intact forest landscapes, primary forests, pristine forests, and wilderness (Clement et al., 2020;

Fletcher et al., 2021). Around the world, these forests are inhabited by Indigenous Peoples and local communities, who are co-responsible for the composition and conservation of their forests (Garnett et al., 2018; IPBES, 2019; Clement et al., 2020; Brondízio et al., 2021; Fernández-Llamazares et al., 2021), which makes all of the terms describing forests of high naturalness problematic. Worse, the people who inhabit these landscapes are seldom consulted by national governments or conservation organizations about forest conservation initiatives that affect their livelihoods (Clement et al., 2020; Brondízio et al., 2021; Fletcher et al., 2021), although numerous studies have shown that these people are responsible for the most preserved forested areas on Earth (Garnett et al., 2018; Fa et al., 2020). In other words, the Indigenous People and local communities who inhabit forested landscapes are part of the solution to global forest conservation challenges. They need to be included as full partners in efforts to conserve forests in the face of ego-centric expansion of global industrial societies that are degrading the planet (Ripple et al., 2017; Clement et al., 2020; Crist et al., 2021).

The term “naturalness” contains seldom recognized biases: it is derived from a definition of nature as being separate from culture and assumes that all human actions degrade nature (Ducarme et al., 2021). This definition and this assumption are common among conservationists trained in the natural sciences, especially in the United States, where National Parks were established to create wilderness from cultural landscapes (Schullery and Whittlesey, 2003). The majority of world cultures do not conceptualize a Nature/Culture divide in the way Western modernity came to do (Ducarme et al., 2021). Since Amazonia is on most world conservationists’ wish-lists for conserving nature, understanding Native Amazonian perspectives is essential, especially as Amazonian Indigenous Peoples and local communities are efficient stewards of their territories when they have legal rights (Garnett et al., 2018; Fa et al., 2020; Brondízio et al., 2021). In this essay, we explore how Amazonian Indigenous Peoples and local communities conceive and relate to the forests in which they live and which they are fighting to conserve. Although we concentrate on Amazonia, other tropical forests and peoples are also likely subject to the trends we highlight (Boivin et al., 2016; Roberts et al., 2016, 2017; Ellis et al., 2021). We then propose an alternative way of thinking about forest conservation.

NATIVE AMAZONIAN VIEWS OF FORESTS

Amazonia is approximately the size of the coterminous United States and harbors not only mega biological diversity, but also mega social, cultural, and linguistic diversity. Hence, talking generically about Amazonian Indigenous Peoples is always risky. However, if there is one extremely widespread concept that these peoples agree upon, it is that everything that exists in the world is a product of relations of cultivation and care among different species (Descola, 1992; Viveiros de Castro, 2004; Kohn, 2013). These relations are social-ecological relations (Berkes, 2017). The forest and its multiple forms of life do not exist

by themselves. Yanomami leader and shaman Davi Kopenawa alludes to this perspective when he says “The white people do not ask themselves where the forest’s value of growth we call *në rope* comes from. They probably think that plants grow alone, without a reason. Or else they take themselves for great workers, able to make plants grow solely through their own efforts. They even call us lazy because we do not destroy as many trees as they do.” (Kopenawa and Albert, 2013: p. 382).

Expanding on this perspective, the Wajãpi leader Kasiripiná, when criticizing an anti-environmental measure taken by the Brazilian government, says: “The land has an owner, the river has an owner, the trees have owners. It was not man who invented nature.” (El País – Brazil, September 11, 2017). The multiple owners are not, for the most part, fully human, but their common characteristic is to care for their creations and crops that are dispersed locally and make up what we call forest. Therefore, it is necessary to negotiate with the owners to inhabit and have access to these forest worlds, which are often the gardens and creations of these other beings (Fausto, 2012; Fausto and Neves, 2018). As Rosenã Wajãpi, Karisipiná’s son-in-law, puts it: “We can’t enter the owners’ spaces freely, we must ask for permission and negotiate. Permissions are requested through chants (prayers), with the assistance of the shaman, through body paintings and the use of fragrant plants to cheer or to soothe the spirits of the owners, so that they will not harm the people who pass through their spaces.”

Describing the perspective of the peoples of the Upper Negro River (northwestern Amazonia) in more detail, Tuyuka anthropologist Justino Sarmiento Rezende explains: “The forest is the home, and the fruit trees are fathers and mothers of the fruit, so they care for and protect them. My grandparents taught me that trees have lives, as do we humans; they are born, they grow, give birth to children and die. The Kumua (shaman), in his protection ceremony, performs the role of ambassador to negotiate with the specialists of other levels. The contents of the protective statements he uses help us understand that trees have fathers, mothers, and grandparents. They have feelings that leave them cheerful, sad, crying; they rebel against the invaders of their homes, defend themselves and can cause diseases and even kill. In their protection ceremonies, the Kumua use categories of human relations to understand the world and the non-human beings. The Kumua are experts who speak and understand the languages of other non-human beings at a ceremonial level. They are specialized in dialogue with the forests and all the lives that are interconnected with the fruit trees [...]. Many lives have connections with fruit trees, such as a diversity of birds and animals, such as pacas (*Cuniculus paca*), agoutis (*Dasyprocta* spp.), wild pigs, monkeys, insects, caterpillars, termites, fish, snakes, spiders, ants, bees, etc. There are many lives in connection with each other. The realization of the protection ceremony avoids fights, wars and deaths among all beings involved. Within this complex world the Kumua uses his ceremonies to talk, dialogue, negotiate, ask for respect for people from all beings mentioned above, he guarantees, on the human side, respect for the beings of forests as their brothers. Therefore, the realization of the fruit offering ceremony requires a great capacity to understand

the dynamics of the lives in connection.” (Rezende, 2021: pp. 89–90).

In this Indigenous perspective, it follows that entering, and especially, using the garden of others is reckless and requires precautions, such as the ceremonies mentioned by Rezende. This perspective includes an ethic that imposes limits on the human uses of the forest, because every action may be subject to a counteraction, which could be, for example, the sending of a disease or a spell. In other words, the forests are not merely resources to be exploited. Both Ailton Krenak, indigenous leader and journalist (Krenak, 2019), and Davi Kopenawa (Kopenawa and Albert, 2013) criticize our western idea of “natural resource” for these reasons, which in turn questions the very fashionable concept of “ecosystem services.” Both the concept of natural resources and of ecosystem services are based on an understanding of naturalness that is devoid of agency, on the belief that objects exist to be exploited and are understood within the logic of the market. In contrast, the Indigenous perception that everything is or can be cultivated and created by someone (human or non-human) implies an “ethic of precaution” (Aparicio, 2020), a philosophy that insists that in order to live in the forest it is necessary to establish close relationships with other forms of life, who are understood to be subjects endowed with social qualities (Descola, 1992; Viveiros de Castro, 2004) and who are fully capable of action, i.e., they have agency (Myers, 2015; Hartigan, 2019).

To better understand these Amazonian Forest guardians, it is essential that we engage with Indigenous perspectives to contrast with our Western perspectives and enrich our understanding. To begin with, we need to deconstruct the idea of naturalness that underlies conservation policies that exclude Indigenous Peoples and local communities (Fletcher et al., 2021). The idea of naturalness is often the philosophical underpinning for waging a real war against Indigenous Peoples and local communities’ ways of living and existing in and alongside forests.

Swidden-Fallow-Forest Succession

Perhaps the ways in which the Wajãpi describe and classify the processes of opening a swidden and subsequent forest succession can help us to think of an alternative to define forest landscapes. Although the classification systems are open, we can describe them as follows (Cabral de Oliveira, 2018): *koo’y* (place that will be a swidden, usually characterized by dense vegetation cover, designated as forest); *koo pyau* [newly planted swidden, which contains a great diversity of species: manioc (*Manihot esculenta*), peach palm (*Bactris gasipaes*), sweet potato (*Ipomoea batatas*), yam (*Dioscorea trifida*), banana (*Musa* spp.), papaya (*Carica papaya*), cupuaçu (*Theobroma grandiflorum*), bacuri (*Platonia insignis*), Brazil nut (*Bertholletia excelsa*) to name a few]; *koo mynerã* (mature swidden, where manioc is being harvested and many fruit trees are producing); *koo tupy* (old swidden, without manioc, when the swidden is visited and cleaned less frequently, especially around the fruit trees that are in full production); *ama’yty* [the swidden that begins its fallow process, constituting what is called *embaúbal* (a stand of *Cecropia* spp.) mixed with fruit species, but where the annual crops are dying out]; *kookwerã pyau* (new fallow, marked by many spiny, herbaceous plants that grow among the *Cecropia*, an area that is difficult to enter and

that holds dangers, although the fruit species are still maintained clean); *kookwerã omana* (old fallow, with fruit species adapted to shade or that are part of the canopy); *isawypa* (the stage in which the vegetation cover has grown to the point where there is no longer the understory characteristic of the succession process, so it is possible to see far into the forest); *ojimo yvyra’e’e pa* [literally what has turned completely into trees, that refers to the full growth of large trees like Brazil nut, kapok (*Ceiba pentandra*), angelim (*Parkia* spp.), etc]; and finally *ojimo ka’a e’e pa* (a mature forest, and therefore it can be cut down to clear land, which restarts the classification cycle we started from – *koo’y*).

This Wajãpi classification highlights transformation and maturation processes, in which human agency interacts with other beings and ecological processes (see Levis et al., 2018), i.e., we are again referring to social-ecological relations. Thus, an alternative to designating forest areas as natural is to think of forest social-ecological succession, which finally approaches fully mature forests that are home to large trees, and a diversity of plant, animal, and spirit inhabitants. These are cultural forests because part of their floristic composition was determined by their human inhabitants (Balée, 2013).

Expanding on the reasoning inherent in the classification, Aikyry Wajãpi observes: “For us *ka’a* is the forest. *Ka’awasu* is the big forest, a very spacious place, where the forest is tall. *Ka’a* for us is very important, because inside the forest we have our food: animals, what we eat. Hunting, fish, birds, fruits, various types of fruits. So *ka’awasu* is where game breeds, a place that is difficult to access, a place that has already become a tall forest, but that does not mean that the forest is primary. Everything is forest here, everything is what you call secondary forest. Wherever we go here, we find traces of our ancestors, of other peoples. . .” Francisco Baniwa agrees about the history when he says: “Every forest has its owner, its mother who guards and protects that place, be it a mountain range, be it a sacred place, be it just a forest. All these places have been visited once.”

Beyond the Swiddens

While many native Amazonian Indigenous Peoples practice swidden-fallow cultivation, some do not, and none live by swiddens alone (Mendes dos Santos, 2016). As Levis et al. (2018) point out, there are many ways that Indigenous Peoples and local communities domesticate forests. The forests are full of trails, opened and used by humans to get from their village to their swiddens, to other resource concentrations, to other villages, to sacred sites. Any useful plant, especially fruit trees, along a trail is protected and otherwise cared for. Plantlets under the protected trees may be transplanted to better locations, where they in turn will be protected and cared for. People often take snacks with them along the trails and discard seeds, which may germinate and subsequently be cared for. Through time trails become domesticated corridors within the forest. Trails also move from place to place within the forest, perhaps because a large tree fell across the trail, or other animals opened alternative routes that people found convenient. Wherever people use the forest, they transform it (Balée, 2013) and even transfigure it (Descola, 2016), which Levis et al. (2018) call domestication of the forest.

While it is possible to acknowledge that “all of these places have been visited once” (Francisco Baniwa), it is not

always possible to determine if a specific forest landscape originated from a swidden or from a multitude of other human and non-human actions through time. Stands of useful trees within the forest, such as the emblematic Brazil nut stands (Shepard and Ramirez, 2011), can reasonably be recognized as anthropogenic (Levis et al., 2018), although many Indigenous Peoples consider them to be the swiddens of agouti (Cabral de Oliveira, 2016). Brazil nut trees may live 500 years or more (Caetano Andrade et al., 2019), which is longer than memory based on oral transmission that may extend only 100–150 years into the past. European conquest and subsequent colonization decimated Native Amazonian populations (Denevan, 2014), which approached their nadir at the end of the rubber boom 100 years ago. The 90–95% loss of the Indigenous population represents a loss of knowledge and memories about forest landscapes, so we may never know the real proportion of modern forests that were once swiddens, although it is likely to be a respectable proportion (Clement et al., 2015). Likewise, we cannot know which individual trees and palms were planted by humans, but 84% of all large-statured trees and palms in Amazonian forests are useful to humans (Coelho et al., 2021).

The point is that for Indigenous Peoples the opposition between the natural and the artificial, between naturalness and anthropogenicity, does not apply. This opposition, which goes back to the origins of Western metaphysics, imposes on us a simplistic dichotomy between nature conservation and human action (Mendes dos Santos, 2020; Ducarme et al., 2021). In their great sociocultural and linguistic diversity, Amazonian peoples continue to promote life in their territories, which, in the case of Brazilian Amazonia, amounts to about 21% of its area. Indigenous lands are the most preserved areas in the forest, even when compared to National Parks and other conservation units (Fa et al., 2020). This is not by chance. It rather results from the ways Indigenous lives became entangled with the forest. Indigenous Peoples transformed the forest without destroying it. By managing plants, animals, and soils they built niches where diversity flourishes, sometimes swidden-fallows, other times domesticated trail-corridors, all of which represent agroforestry systems. Humans became entangled in this vital multiplicity, making it proliferate in a direction that benefited life and its diversity. We can say that Indigenous Peoples continue to be part of the co-evolutionary processes that constitute the biodiversity of Amazonia, as demonstrated by studies of historical ecology (Levis et al., 2017; Franco-Moraes et al., 2019) and archeology (Clement et al., 2015; Fausto and Neves, 2018; Neves, 2020).

RETHINKING FOREST CONSERVATION

Amazonian forests are not natural. They are cultural because they are part of Amazonian social-ecological relations. They can be called domesticated (Clement et al., 2015; Levis et al., 2018). Their current composition and structure are the result of intimate social-ecological interactions among Indigenous Peoples, plants, animals, and other non-humans (Balée, 2013; Fausto and Neves, 2018; Mendes dos Santos and Henriques Soares, 2021). These interactions are ongoing wherever Indigenous Peoples and other traditional communities

have rights to their lands (Brondízio et al., 2021). It follows that conservation in these forest landscapes is not only about nature, as many conservationists imagine; it is about culture also.

So how can we integrate the Indigenous social-ecological perspective with Western ideas of forest conservation? From the Wajãpi classification of forest landscapes it is clear that many landscapes arose from swiddens (koo) or along trails; they represent a mosaic in both space and time, since each Wajãpi family opens a new swidden every year. Although few crops were mentioned by name, swiddens are full of agrobiodiversity, or genetic resources in conservation parlance (CBD, 1992). In the terminology of genetic resources conservation, a swidden represents “on farm” conservation (FAO, 2009). Since the fallow that follows the swidden is an intimate part of the cycle, fallows also represent on farm conservation, especially as they contain an abundance of cultivated and managed plants that are adapted to increasingly mature forest environments. Even when the fallow has matured to ojimo ka’a e’e pa, it contains arboreal plants that were cultivated and managed. This is also true of the plants along the trails. Observe that human agency, the numerous practices that humans use to manage plants in landscapes (Levis et al., 2018), is present even in mature forests (ojimo ka’a e’e pa). It follows that forests without management will change into something else (Flores and Levis, 2021). In other words, the Amazonian forests that are on the wish-lists of most world conservationists depend upon their human inhabitants. If the humans are removed to create a National Park, the landscapes will change, as happened in Yellowstone (Schullery and Whittlesey, 2003).

We can continue the analogy with genetic resources conservation by examining *in situ* conservation. This category is designed for wild relatives of crop populations (FAO, 2009). Wild relatives grow and reproduce in ecosystems with minimal or no human manipulation, where ecological and evolutionary processes are thought to be natural [but refer to how easy it is to domesticate a forest! (Levis et al., 2018)]. A National Park in most countries, e.g., the United States (Yellowstone) or Brazil, represents *in situ* conservation for the wild relatives of crops that may occur there. When humans are removed from a territory, as happened in Yellowstone or across Amazonia during European colonization (Denevan, 2014), the landscapes change. During the following years, decades and centuries, genetic resources of once cultivated species will erode from their landscapes depending upon their growth habit, lifecycle and degree of domestication (Clement, 1999). The outcome will be a forest unlike any seen in Amazonia during the Holocene since humans interacted with all Amazonian forests during this period. These forests will continue to provide ecosystem services, but the composition of their biodiversity will change, and they will offer fewer provisioning services for humans (Flores and Levis, 2021).

Thinking about Indigenous Lands and the presence of local populations in forest areas as on-farm conservation allows us to take seriously the philosophies of Indigenous Peoples who insist that other beings cultivate and create their gardens that appear to non-Indigenous Peoples to be wild plants and landscapes. Here, we cannot lose sight of the fact that if Indigenous Lands are the opposite of biodiversity extinction, this is not due to a conservationist ideal such as our Western ideal, but rather to

philosophies that recognize non-human beings as subjects, not objects, and that lead to ethics of moderation and precaution (Aparicio, 2020).

CONCLUSION

Amazonian Indigenous Peoples consider their forests to be social-ecological landscapes, not natural landscapes. This perspective is derived from the fact that all beings, human and non-human, are involved in webs of social relations, not merely ecological relations, i.e., social-ecological relations, and that all beings have agency. The webs of social-ecological interactions require humans to respect other beings, which leads to ethics of moderation and precaution. Human and non-human agencies cultivate and care for plants, animals, and landscapes within the forests, transforming them into social-ecological landscapes. These perspectives allow us to move beyond nature conservation, which is normally blind to culture, and propose that the concepts of genetic resources conservation are more appropriate when thinking and planning for conservation of forest cultural landscapes. This alternative view is appropriate because genetic resources are created in cultural spaces: agriculture (the culture of fields), horticulture (the culture of gardens, i.e., swiddens), arboriculture (the culture of trees, always planted in swiddens, as well as elsewhere in the landscape), and silviculture (the culture of forests). If we adopt this view, it is clear that naturalness is in the eye of the beholder. If you are a member of an Indigenous People or traditional local community you know your forest, you know it is a mosaic of social-ecological relations; if you don't have this life experience, it appears natural.

What are the implications of this conclusion for world conservation discourse? The terms natural, intact, primary, pristine, and wilderness should not be associated with forests in which Indigenous Peoples and local communities live. After all, these terms imply that the people who live in these forests are part of the problem, i.e., they are just as rapacious as other ego-centric actors of global industrial societies. However, as we demonstrated, echoing the understanding of some Indigenous Peoples, not all human modes of existence lead to the depletion of biodiversity. Many of the worldviews of Indigenous Peoples in Amazonia operate with an eco-centric understanding of the world, which has the pragmatic effect of maintaining

and sometimes increasing biodiversity. Such worldviews are similarly structured in many other Indigenous Peoples and local communities around the planet. The urgency of conserving these socially and ecologically important forests worldwide is unquestionable and Indigenous Peoples and local communities are important partners to achieve this. Full partnership requires world conservationists to abandon ego-centric worldviews and terms that are exclusionary and understand alternative environmental ethics that are collective.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

CRC, CL, JCO, CF, and GMS: conceptualization. CL, JCO, CF, GMS, FFB, MM, AW, RW, and GSM: investigation. CRC, JCO, CF, GMS, and CL: writing—original draft preparation. CRC, CL, GMS, CF, and JCO: writing—review and editing. All authors have read and agreed to the published version of the manuscript.

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