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Article

Conservation and Care among the Cofán in the Ecuadorian Amazon

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Abstract

Accelerating deforestation and ecological degradation, linked to political and economic policies and agendas that endanger the health, well-being, and cultural survival of Indigenous people, present dire threats to the Amazonian biome and its inhabitants. Confronting these challenges necessitates a unified response by local and global partners. However, some conservationists, predominantly from the Global North, have perpetuated problematic, essentialised framings of Indigenous communities, which have even led them to advocate for punitive protectionist policies that we argue are morally and conceptually flawed. Western scientific and popular discourse often presents nature conservation via protected areas as a universal good. In this article, we argue for a more pluralistic approach; one that calls for an equitable footing between Indigenous knowledge and sustainability science. We examine a case study of the Cofán community of Zábalo in the Ecuadorian Amazon, where collective efforts to *tsampima coiraye* (=care for the forest) have resulted in dynamic institutions adapted to diverse challenges and opportunities. *Tsampima coiraye* exemplifies a form of caretaking that is distinct from and complementary to Western conservation, one that provides important insights into understanding the context and meanings through which community governance fosters stewardship. We draw upon longitudinal ethnographic fieldwork and the Cofán concept of *puifama atesuye* (=Two-World Knowledge) to describe collective action, community governance, and caretaking.

Keywords: Amazon, care, conservation, Cofán, Ecuador, indigenous people

Abstract and title in Cofán and Spanish: https://bit.ly/3zE16X6

INTRODUCTION

The Amazon is a global hotspot of biocultural diversity with over 400 Indigenous groups and more species of animals and plants documented than any other terrestrial ecosystem on the planet (Gorenflo et al. 2012). Archaeological, botanical, and ecological research demonstrates that a significant portion of the Amazon's supposedly 'pristine' forests are, in fact, cultural forests with a long legacy of human management (Baleé 2013). At different times and places, Native Amazonians have increased species diversity and soil fertility, domesticated crops and landscapes, and adapted their subsistence activities to environmental constraints, supporting large populations across Amazonia (Denevan 1992; Heckenberger et al. 2008, Clement et al. 2015; Levis et al. 2017; Maezumi et al. 2018).

In addition to shaping Amazonia's past, Indigenous peoples are critical to its future. Native Amazonians manage approximately 27% of the biome (RAISG 2020), where local institutions and governance regimes have reduced deforestation to levels equal to or better than those of protected areas (Nepstad et al. 2006; Gray et al. 2008; Ricketts et al.

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2010; Nolte et al. 2013; Ceddia et al. 2015; Blackman et al. 2017; Schleicher et al. 2017). Indigenous territories and locally adapted institutions have been linked to higher biodiversity (Pretty et al. 2009; Stevens 2014), lower carbon emissions (Chhatre and Agrawal 2009; Collins and Mitchard 2017; Walker et al. 2020), and fewer wildfires than in strict protected areas (Nelson and Chomitz 2011). In numerous locations and circumstances, institutions developed by Indigenous peoples have resulted in successful outcomes for sustaining biodiversity and ecosystem function (Brondizio and Le Tourneau 2016; Norman 2017).

While these outcomes are critical to conservation efforts, debates about the role of Indigenous communities in conservation (e.g., Alcorn 1993; Dove 2006) have been constrained by significant shortcomings. These include framings that continue to separate nature and culture, perpetuate the 'ecologically noble savage' myth, conceptualise subsistence and market economies as mutually exclusive, and assume Indigenous homogeneity. The concept of 'conservation' is also being increasingly interrogated (e.g., Evans 2021), along with the acceptations, agendas, and assumptions of 'conservation' as an unalloyed good, rather than as a culturally, politically, and historically laden concept (Holt 2005). Encouragingly, scholars are expanding and critiquing conceptualisations of conservation and its ties to colonialism, white supremacy, racism, and classism (e.g., Domínguez and Luoma 2020). As we discuss, some new approaches to conservation—which are increasingly interdisciplinary, collaborative, and participatory—recognise that collective stewardship is a fundamentally social process predicated on learning, decision-making, governance, and adaptation. While these approaches are still predominantly Western-centric, they represent advances in recognising the importance of Indigenous knowledge and stewardship practices (Berkes 2018).

In this article, we argue for a more pluralistic approach to stewardship, one that builds upon efforts to bridge Indigenous knowledge and sustainability science (Mistry and Berardi 2016; Whyte et al. 2016; Reid et al. 2020). We turn to a case study of the Cofán community of Zábalo in the Ecuadorian Amazon, where collective efforts to *tsampima coiraye* (=care for the forest) manifest in dynamic institutions adapted to diverse challenges and opportunities. *Tsampima coiraye* exemplifies a form of caretaking that is distinct from and complementary to Western conservation. As such, it is generative to hold these in parallel and of equal importance, as opposed to looking for ways in which Cofán actions align with mainstream conservation. We draw on the Cofán concept of *puifama atesuye* (=Two-World Knowledge) in order to examine multiple perspectives, worldviews, and means of caring for the environment in parallel. This approach moves beyond the tendency of integrating, combining, or incorporating multiple ways of knowing; it instead builds an ethic of coexistence and complementarity in stewardship. Confronted with forces of change, the Cofán of Zábalo engage, draw on, and re-imagine cultural concepts of *opatssi* (=peaceful well-being), *tsampima coiraye*, and *se'pi'cho* (=prohibitions), which reflect their heterogeneous aspirations, governance structures, cultural identities, and knowledge systems.

CONSERVATION AND INDIGENOUS PEOPLES

Protectionists and protected areas

Conceptions of wilderness and 'pristine' nature have motivated protectionist strategies focused on the creation and expansion of protected areas where endangered biodiversity and key ecological processes can operate with minimal human intrusion (Di Marco et al. 2019). Recent protectionist proposals (e.g., Half-Earth, Nature Needs Half, 30x30) seek to protect between 30% and 50% of the planet's terrestrial area through a mosaic of protected areas and other conservation measures that exclude most people and economic activities (e.g., Wilson 2016; Dinerstein et al. 2019; Waldron et al. 2020). The 30% objective is currently being pushed for adoption at the 2021 Convention on Biological Diversity and has been endorsed by numerous countries and conservation organisations.

These proposals ignore decades of research and experience on the social impacts of conservation (see Büscher et al. 2017; Agrawal et al. 2020). Such 'fortress' approaches to conservation have resulted in human displacement and land alienation, as well as restrictions on both livelihood activities and access to resources (Brockington and Igoe 2006; West et al. 2006; Agrawal and Redford 2009; Dowie 2009). These actions conflict with human rights and international law (Alcorn 1993; Colchester 2000) and are counterproductive, harming Indigenous peoples' defence of large areas of the planet from deforestation and carbon emissions (Schwartzman et al. 2000; Garnett et al. 2018). This is particularly true in the Amazon, where the presence of Indigenous peoples is intricately linked to certain positive environmental outcomes (Brondizio and Le Tourneau 2016). In fact, many places attractive to conservation initiatives across Amazonia have been actively shaped and managed by humans over millennia (Denevan 1992; Heckenberger et al. 2008; Clement et al. 2015). The approximately 27% of the region to which Native Amazonians currently have tenure or management rights overlaps with nearly 18% of all protected areas (RAISG 2020). Despite the importance of their lands to conservation targets, protectionist proposals fail to account for how many Indigenous people will be impacted by their strategies (RRI 2020) and largely neglect Indigenous voices (Kothari 2021). For example, Indigenous communities are not recognised as parties to the aforementioned Convention on Biological Diversity; they have no vote in such international agreements.

Some protectionists promote the inclusion of small groups of Indigenous peoples within the bounds of protected areas, particularly if they are seen to have a "traditional role as rainforest stewards" (NNH 2017) whose livelihoods are considered suitable within such spaces. Kopnina (2016: 179) furthers this expectation: "if Indigenous communities would prefer to remain in those areas while maintaining traditional livelihoods, and if it can be shown that their presence would indeed not be detrimental to ecological integrity, reconciliation may be possible." This protectionist view of Indigenous peoples reproduces a long tradition of "green primitivism"

(Ellen 1986) and "green orientalism" (Lohmann 1993) that relies on the trope of the "ecologically noble savage" (Redford 1991; Hames 2007). Indigenous peoples become "permitted eco-Indians" (DeVore et al. 2019), approved to reside within protected areas as long as they adhere to external conditions consistent with their romanticised role as guardians of nature.

Across Amazonia, the Indigenous peoples considered as part of conservation efforts are those deemed as being 'harmonious' with nature, i.e., those living in dispersed communities at low population densities, utilising traditional hunting tools such as blowguns and spears, and procuring resources only for subsistence (Kramer et al. 1997; Brandon et al. 1998; Oates 1999; Terborgh 1999; Suarez and Zapata-Ríos 2019). The rationale of conservation biologists who purport such positions is that Indigenous groups with these characteristics are unlikely to have negative impacts on ecosystems due to demographic, technological, and economic limitations (i.e., exhibiting epiphenomenal conservation; Alvard 1993). With the advent of sustained interaction with outsiders and the larger society, however, a cascade of changes is set in motion, rendering Indigenous peoples presumably less conservation-friendly (Redford 1991; Holt 2005). These changes include a reliance on manufactured goods, participation in the market economy, increasing consumption aspirations, loss of ecological knowledge, and a shift in settlement patterns (Godoy 2001). Many Western conservation adherents have lamented this seemingly inexorable and inevitable process of Indigenous cultural change. In response, they have proposed protectionist measures such as hunting restrictions and even punitive policies such as resettlement to less ecologically important areas (Terborgh 1999; Suarez and Zapata-Ríos 2019). Such extreme measures are framed as necessary due to a moral imperative to address ecological crises; crises that conservation groups have the power to unilaterally declare (Wilshusen et al. 2002).

Beyond the immediate concerns of paternalism, colonialism, and disregard for Indigenous sovereignty and self-determination, such approaches are conceptually flawed. The field of common property theory (e.g., Ostrom 1990, 2005, 2010) has transformed our understanding of the emergence and persistence of bottom-up systems of environmental stewardship. Research on Native Amazonian common property regimes reveals the conditions which foster the emergence and persistence of conservationist practices and institutions. These conditions include people recognising that a resource is becoming scarce, that their exploitation of the resource is having deleterious consequences, that the resource is of importance to their survival and well-being, and that they have the capability to regulate their use and address overexploitation (Lu 2001, Agrawal 2002). In a case study of the Waorani of Ecuador, declining abundance of floral and faunal populations with intensification of oil extraction, market integration, and urbanisation resulted in perceptual and behavioural changes (e.g., stronger boundaries around their villages and reducing pressure on vulnerable game populations) to defend cultural ways of life (Lu 2001; Lu and Wirth 2011).

This paradox, labelled the 'Catch-22' of conservation, describes how the cultural conditions of Indigenous peoples that protectionists deem compatible with conservation are precisely those from which we would not predict conservation practices (i.e., resource stewardship through collective restraint entailing short term costs) to emerge (Holt 2005). Situated in political economy and economic scholarship, discussions about individuals overcoming impediments to acting in the collective good are still mired in Western concepts of individualism and rational actors, which reflect framings of deficit and damage, scarcity and struggle. Understanding how Indigenous people themselves are motivated to act and what meanings they ascribe to these efforts are vital to designing effective policies and forging coalitions.

Conservation beyond the divide

Indigenous stewardship practices are increasingly recognised as pathways for effective and socially just conservation (Ban et al. 2018; Artelle et al. 2019). A number of conservation approaches have emerged that embrace the interrelationships between Indigenous people and the environment. These approaches focus on incorporating multiple knowledge sets and worldviews, embracing inclusive governance mechanisms, and ensuring Indigenous rights to lands and resources. Here we summarise three approaches (rights-based, biocultural, and convivial) as they relate to Indigenous peoples and conservation.

Rights-based approaches represent an opportunity to ensure that conservation policy and practices support Indigenous peoples' rights to justice, self-determination, and well-being (Jonas et al. 2010). These strategies account for the historical context of dispossession and actively oppose frameworks that fail to recognise Indigenous rights (RRI 2020). Rights-based approaches recognise Indigenous people as "rights holders, not just stakeholders" in conservation (Ooft 2008: 21). Biocultural approaches to conservation seek to respect and uphold these rights. These approaches prioritise partnerships, recognise the importance of tailoring interventions to specific contexts, and incorporate diverse worldviews and knowledge systems into conservation planning (Gavin et al. 2015). Drawing on pluralistic systems of governance and management can improve conservation's capacity to adapt to complex, diverse, and dynamic challenges (Rozzi et al. 2018). Finally, convivial conservation is an approach built on the premise of equity, structural change, and environmental justice (Büscher and Fletcher 2019). Rather than "protect nature from people," this approach encourages ways to 'con vivir' (live with) nature by focusing on the vital interdependencies among humans and ecosystems, toward the mutual regeneration of both. Convivial conservation also pays special attention to the ways that Indigenous peoples themselves lead and inspire different forms of resistance to colonial violence.

Recent work by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) draws on these movements and explores new methods to incorporate the rights of Indigenous peoples into international biodiversity assessments and decision-making (IPBES 2019). For example, IPBES draws on the multiple evidence base

framework (Tengö 2017) to recognise the value of diverse knowledge systems. The approach we advocate instead moves beyond integrating, combining, or incorporating Indigenous knowledge and ways of knowing into Western science. Existing frameworks, such as "Two-Eyed Seeing" (*Etuaptmumk* in Mi'kmaw; Reid et al. 2020), "Double-Canoe" (*Waka-Tauruain* in Māori; Maxwell et al. 2019), and "Two Ways" (*Ganma* in Yolngu; Muller 2012), build an ethic of knowledge coexistence and complementarity in knowledge generation. They also highlight the contemporary and dynamic realities of Indigenous knowledge systems, as opposed to often-static notions of the 'traditional' (e.g., traditional ecological knowledge) that has dominated the conservation literature (Gómez-Baggethun et al. 2013).

In this article, we utilise the Cofán concept of *puifama atesuye* as an epistemological framework to simultaneously hold and understand multiple ways of knowing and related practices. This framework is dynamic, pragmatic, and driven by desires to *tsampima coiraye*. Cofán knowledge, including *puifama atesuye* and institutions of *tsampima coiraye*, is a necessary complement to theories of common pool resource management, adaptive management, and resilience thinking, in part because it does not fundamentally emerge from Western notions of a nature/culture divide (Whyte et al. 2016; Berkes 2018).

METHODS

Study site

This study is based on research conducted in the Cofán territory of Zábalo in the Ecuadorian Amazon. Approximately 1,500 self-identifying Cofán people currently live in Ecuador, and over 1,100 more live in Colombia. These numbers are not exact due to regular movement across the border as well as decades of colonisation, intermarriage, and cultural change. In Ecuador, the Cofán inhabit the region composed of the Aguarico and San Miguel rivers. They currently hold legal title to five distinct territories which contain 13 communities. Zábalo is located along the Aguarico River in the north-eastern corner of Ecuador and totals over 142,000 hectares. For almost every resident of Zábalo, *A'ingae* is the exclusive language of everyday life, although Spanish is also understood across much of the territory, with varying degrees of fluency. There are approximately 180 individuals belonging to 39 families in Zábalo. Most residents live within four population clusters along the main body of the Aguarico River, though some families have chosen to live outside of these clusters.

Zábalo residents hunt, fish, and gather throughout their territory, and they maintain *nasipa* (horticultural fields) next to their homes and in more distant locations along the Aguarico River. Visiting and sharing networks are especially strong within family units and village clusters, although they also span the entire community. Sharing includes both food and durable goods. Wage labour performed to purchase goods spans different economic activities. The primary form of wage labour is tourism, which includes driving canoes, building and cleaning tourist houses, cooking, and serving as guides. Other forms of wage labour include working on scientific projects, selling coffee and cacao, and building fiberglass canoes.

Methods

Much of the ethnographic information in this article comes from Felipe Borman Quenama, a trilingual Cofán leader and *puifama atesu'cho* (knower of both sides) who moves between Zábalo and urbanised spaces in his roles as a skilled hunter and fisherman, former municipality president (*Parroquia Cuyabeno*), graduate student, and collaborator with non-Cofán people. His experience is combined with Michael Esbach and Flora Lu's long-term research with the Cofán and other Indigenous peoples in the Ecuadorian Amazon. For this article, Esbach spent approximately 16 months over four years in Zábalo, where he participated in hunting and fishing expeditions, community meetings, *mingas* (communal work gatherings), and everyday life. With Cofán colleagues, he took GPS measurements of various features of Cofán territory, including boundaries, houses, and streams; these data were incorporated in GIS and made into maps (see Figure 1). He also conducted semi-structured interviews related to conservation and resource use (n=32), in addition to formal and informal interviews with Zábalo's leadership, elected officials (e.g., president, vice-president), and elders in order to better understand agreements with the government, resource management rules, and more. An intentional sampling strategy was used in order to ascertain a diversity of expertise related to the topics of interest. Interviews were conducted in Spanish or *A'ingae* (with the support of a Cofán translator).

RESULTS AND DISCUSSION

We argue that collective efforts to *tsampima coiraye* among the Cofán of Zábalo exemplify a form of caretaking that is distinct from and complementary to Western conservation, and provides important insights into understanding the context and meanings through which community governance fosters stewardship. We describe its emergence within a specific historical, cultural, and political context. In doing so, we assert that the Cofán were motivated to maintain an *opatssi* lifestyle characterised by abundant sources of food, medicine, and clean air and water. In their desire to *tsampima coiraye*, the Cofán modify their conceptualisations, practices, negotiations with outsiders, and participation with outside initiatives and institutions, recognising that while obligations for enacting care endure, ways of doing so are dynamic.

Context

Historical accounts describe the Cofán as hunters and fishers whose survival was tightly linked to the health of the forests and rivers in an ancestral territory of over three million hectares (Robinson 1979; Borman 1996). From their territory's abundant resources, the Cofán population thrived, growing to an estimated 20,000 people by the year 1600 (Friede 1952). Like

many Native Amazonian nations, the Cofán practiced a semi-nomadic settlement pattern across their territory: as desired resources within an area diminished or became increasingly difficult to access, they would simply move and allow the environment time to recuperate. They also accumulated extensive ecological knowledge related to their territory through incremental learning based on detailed observations over time (Turner and Berkes 2006). As such, researchers characterise the Cofán as forest specialists, with intricate ethnobotanical knowledge and the utilisation of nearly 300 plant species (Pinkley 1973; Cerón 1995) and a large pharmacy of medicinal plants (Robinson 1979). Overall, rich ecological knowledge informed practices that allowed the Cofán to thrive in and care for their Amazonian environment for generations.

Such expertise and practices contributed to achieving a preferred style of existence expressed by the word *opatssi* (Cepek 2012). This lifestyle is dependent upon a healthy, intact forest characterised by abundant sources of food, medicine, and clean air and water. Cofán people seek to maintain the highest amount of peaceful and calm *opatssi* conviviality. Such activities support a state of plenty and stability, particularly in terms of food. *Opatssi* values and practices produce reciprocity among community members who express goodwill and generosity, thereby furthering an *opatssi* existence for themselves and their community (Cepek 2012).

Opatssi lifeways were shattered in 1964 after the discovery of large petroleum fields in Cofán territory. In partnership with the Ecuadorian government, a Texaco-Gulf consortium constructed roads throughout north-eastern Ecuador, eventually connecting the Amazon to Quito in 1972. The completion of this road initiated a process of dramatic ecological devastation that would inexorably impact the lives of the region's Indigenous peoples. The primary driver of this change was the government's land reform policies, which viewed Cofán ancestral territory as *terra nullius*, or uninhabited land. Thousands of colonists from across Ecuador were each granted 50 ha of land under a mandate to clear a percentage of that forest for crops in a specific period of time (Pichón 1997). Cofán communal property was granted to colonists as private property given that the latter were willing to make the land 'productive.'

For the Cofán, the impacts of colonisation were dire; within 20 years, they nearly lost their entire territory. As colonists flooded the lowlands of the Amazon, the Cofán were able to do little to stop them due to unequal power relations and opposing cultural understandings, particularly their historical relations with outsiders and their concept of property rights. The Cofán signal land ownership through specific acts of labour, such as clearing the forest to build a house or grow a garden. The broader forest was always shared for hunting, fishing, and gathering, even with neighbouring Indigenous peoples (e.g., Siona, Siekopai). The Cofán tolerated colonisation in the 1970s because they believed that, like the outsiders who came before them (e.g., priests, rubber tappers), the colonists would eventually leave. They also believed that they would be able to continue hunting, fishing, and gathering throughout their traditional territory. Private ownership of the forest was a foreign idea; even more incomprehensible was the notion that colonists could restrict them from hunting, fishing, and gathering within such a vast forest (Cepek 2018). In addition to these cultural understandings, the continuations of resource colonialism going back centuries created unequal power relations that violently impacted Cofán bodies, culture, and livelihoods. These relations were embedded in and manifest through infrastructure development, agrarian policies (e.g., diminished access to resources, territorial loss), ecological degradation and contamination, language and cultural barriers, structural racism, and more.

It took the Cofán nearly a decade to respond to the colonisation that began in 1972. By the late-1970s, Cofán leadership, with the support of American missionary-linguists, Bub (Marlytte) and Bobbie (Roberta) Borman, began to seek land title for the territory surrounding the settlement of Dureno. Despite being allotted a larger area, the Cofán only titled 9,500 ha because they believed the area was too large to use and that much of the land was located far from the Aguarico River where *cocoya* (malevolent supernatural beings) dwell (Cepek 2018). In the years to follow, a network of roads built by oil companies would surround Dureno, encouraging further colonisation and land-use change. By the early 1980s, Dureno was a fragment of forest enclosed by outsiders and oil operations. In this isolated space, the Cofán observed the effects of widespread forest loss. At the same time, they struggled with the impacts of their own subsistence activities on local wildlife populations within a restricted space; areas could no longer recuperate because use pressure by a now sedentary community was constant. By exhausting game populations and weakening subsistence livelihoods, social relations became increasingly tense, with less sharing and inter-household support. Financial stress followed, as the need to buy food necessitated more money. Working for money left residents with less time and energy to sustain community life (e.g., house building, gardening), thereby threatening the peaceful well-being (*opatssi*) of Dureno. This history informs contemporary Cofán social and environmental stewardship, demonstrating the differences in their worldview and that of the larger Ecuadorian state, the possibilities of alliances with outsiders, the need to engage and inform resource management policies, and the exigency of protecting the conditions that enable thriving livelihoods and lifeways.

Scarcity or abundance

In order to escape the challenging lifestyle of Dureno, several residents began making regular trips to Zábalo, an area downriver favoured for hunting and collecting turtle eggs. For generations, the Cofán travelled to this area, where they made simple houses and gardens to enjoy for months at a time. In 1981, a group took up permanent residence in Zábalo in order to enjoy an *opatssi* lifestyle. This move separated them from the roads, intensive agriculture, and *cocama* (outsiders, colonists) that increasingly surrounded Dureno and steadily produced a lifestyle in opposition to *opatssi*, one frequently characterised by hunger, sickness, fear, and conflict.

Zábalo residents began to examine their identity in new ways (Cepek 2008), and to contrast themselves with those in Dureno. For generations, the Cofán identified themselves and their Indigenous neighbours as *tsampini can'jensundeccu* (dwellers of the forest). With the colonisation of their lands, however, they began to create distinctions between themselves, who depend upon the forest through activities like hunting and fishing, and *cocama*, who destroy the forest. With this shift, the Cofán began to identify themselves as *tsampima coirasundeccu* (caretakers of the forest) given their desire to maintain their livelihoods, cultural identities, and an *optassi* lifestyle. To care for the plant and animal abundance necessary for such an existence, the Cofán drew on their deep ecological knowledge and instituted intentional efforts of acquiring legal rights to land, developing institutions to govern their own activities, and enacting practices to keep *cocama* out. In other words, the Cofán purposefully constructed formal institutions related to the care of their environment.

The Cofán of Zábalo recognised the importance of a large land base and a secure title. An important factor in realising these gains was the emergence of Randy Borman as a recognised Cofán leader (see Cepek 2012). The son of the same missionary-linguists who supported Dureno's legal title, Borman grew up speaking *A'ingae* in Cofán communities and married a Cofán woman from Dureno with whom he has raised three Cofán-identifying children. As a trilingual, university-educated man, Borman has utilised his unique positionality to become an effective Cofán leader. In many ways, Borman embodies the Cofán concept of *puifama atesuye* in his ability to pair knowledge and create meaningful collaborations. This includes working with Cofán leaders and the Ecuadorian government to regain control over their ancestral territories and create a more robust degree of protection against outsiders.

Shortly after his move to Zábalo in 1981 with a number of other Cofán families, Borman led the process of officially filing for land title with the Ecuadorian Institute of Agrarian Reform and Colonization (IERAC), a division of Ministry of Agriculture and Ranching (MAG) responsible for land titling. In 1991, the Cuyabeno Wildlife Reserve, previously located to the west of Zábalo, was extended to include the community, leaving the Cofán of Zábalo with no legal status. The Cofán sent a delegation to Quito to publicly contest the reserve's extension. In July 1992, after a series of meetings in Quito between MAG officials and Cofán leaders, a co-management agreement was signed that formalised legal rights to 85,000 ha of territory inside Cuyabeno. In return for recognition of their territorial rights, the Cofán agreed to continue their established management practices (*se'pi'cho*, discussed below). The Cofán would go on to sign additional agreements in 1999, 2006, and 2019 with what is now the Ministry of Environment (MAE), increasing their territorial rights in Zábalo to over 142,000 ha. This agreement between Zábalo and the MAE was the first agreement in Ecuador to formalise Indigenous rights within part of the National System of Protected Areas (SNAP).

Much of this success stems from Borman's ability to create relations with new allies and experiment with methods of pairing knowledge systems in ways that balance multiple priorities. For example, where the MAE views wildlife within Zábalo as biodiversity to be protected and managed, the Cofán view *añacho* (simultaneously animals and food) as elements to be cared for so as to maintain their livelihoods, cultural identity, and *opatssi* existence. *Puifama atesuye* entails the navigation of divergent epistemologies, languages, and worldviews as a form of enacting agency and self-determination. Forming new alliances to work together for mutual benefit does not have to result in subsuming, flattening, or appropriating one culture by another. The coexistence of divergent perspectives can shift entrenched understandings, make different assumptions, and appeal to alternative motivations.

For example, as discussed earlier, theorisations about the emergence of conservation efforts centre the role of scarcity as a motivating force that compels action to avoid shortfall and precarity (see section Conservation and Indigenous peoples; Lu 2001; Lu and Wirth 2011). In the predominant Western conservation narrative, collective efforts for the greater good are difficult to achieve (e.g., Hardin 1968)—individuals must realise that it is in their vested interest to collaborate, forego short term gains, and overcome the urge to free ride or defect. Hence conservation approaches focus on top-down efforts to protect nature in peril. While the ecological transformation of their ancestral lands did result in resource scarcity, we argue that the Cofán were motivated to care for their forest as a means of securing an *optassi* lifestyle of abundance and conviviality; it was desire-centred rather than deficit-based. Through their mobilisation, the Cofán of Zábalo did not seek a return to some primordial state—instead they sought to reaffirm their difference in relation to outsiders and realise their aspirations and values.

Institutions of care

With the legal recognition of their land, the Cofán of Zábalo crafted diverse institutions to *tsampima coiraye*, embedded in forms of sociality among humans and between humans and non-humans. Although these institutions (i.e., shared rules or norms) are culturally and morally codified, they converge with theories of common property, adaptive management, and resilience, which we discuss below.

Collective care

Officially recognised residents of Zábalo (*socios*) receive diverse benefits, including access to land to build a house and garden, as well as rights to harvest animals, fish, and plants. *Socio* status is straightforward for the offspring of current members: children obtain official membership at the age of 15. There are a number of rules determining if outsiders can become members. Any Cofán person from another community can reside in Zábalo if they marry or are related by blood to a current resident. Zábalo men who marry an Indigenous woman from another ethnic group can live in Zábalo. However, Zábalo women who marry a non-Cofán man have to forfeit their *socio* status and residency in the community. While there are some exceptions, particularly for men, if a Cofán person marries a non-Indigenous person, they also forfeit their membership. Any outsider who meets

the rules necessary for living in Zábalo must undergo a one-year trial period to test their fit in the community and ability to learn *A'ingae*. After the one-year trial, the community then votes, with a majority required to make them official members. Beyond limiting Zábalo's resources to mainly Cofán people, these rules function to control population size, a critical aspect of maintaining intra-group cohesion and accountability.

The Cofán of Zábalo have also created strategies to patrol and defend their territory. In response to pressures on the government from Cofán leaders, and in recognition that Cofán territories overlap with protected areas, the MAE signed *Acuerdo No.* 138 (2002) and *Registro Official No.* 5 (2003), officially declaring their support of the Cofán guard programme. The MAE's support for the Cofán guard programme makes sense given that it is a cost-effective means of managing the country's protected areas and conserving biodiversity and ecosystem services. Cofán guards regularly patrol the territory of Zábalo, maintaining trails and a permanent presence in guard stations located at the boundaries of their territory. Today, all Zábalo *socios*, both men and women, participate in different patrols and territorial delineation efforts. Groups rotate to different regions of the territory each year to complete these activities, and different families live in guard stations for months at a time. While the Cofán guard programme may seem akin to protectionist strategies, viewing the programme through a Two-World Knowledge perspective highlights the Cofán's ability to pair Western strategies with work that resonates culturally. Cofán guards, for example, feel pride that they are able to conduct legitimate work (i.e., work in the forest in a manner that utilises their unique knowledge and skills) and simultaneously care for their territory in ways that benefit everyone.

Se'pi'cho

Cofán care is elaborated in the institution of *se'pi'cho*. Over three decades of discussion and experimentation has resulted in a complex and dynamic system that structures relationships between the human and non-human (see Table 1 and Figure 1). *Se'pi'cho* does not only refer to regulations on subsistence activities; it relates to a broader concept of prohibitions important in many areas of Cofán culture. In its most general sense, *se'pi'cho* is a restriction made by an agent (e.g., individual, shaman, supernatural being) to block someone's engagement in an activity and/or their use/consumption of an object (Cepek 2012). The most regularly discussed *se'pi'cho* are menstrual prohibitions, which restrict a woman's schedule during her menstrual cycle. The Cofán typically follow these prohibitions out of fear of retaliation by supernatural agents who are angered by the sight and smell of menstrual blood. Other prohibitions arise when a shaman or individual prohibits another from eating certain animals in order to support their health or well-being. For example, the excessive consumption of Piping guan is frequently prohibited for fear that the bird's white feathers will result in premature grey hair. By expanding *se'pi'cho* to include everyday subsistence prohibitions, the Cofán of Zábalo created new rules based on a previously established, shared, and respected institution.

Se'pi'cho pertaining to environmental dynamics are different from these other forms of *se'pi'cho* in that the former are products of community-wide discussions and decisions. These activities take place during an annual meeting in December, directed by community leadership. The elected secretary reads the full list of prohibitions that have been established and offers them up for discussion. At this point, people begin to share their reflections on specific ecological issues and changes in animal populations, supported by their empirical observations. Daily subsistence activities act as a form of monitoring, whereby Cofán residents, both as individuals and as a community, acquire fine-grained understandings about variations in resources. Over time, these daily observations foster nuanced ecological understandings, such as the abundance of different populations and their distributions across the landscape. Knowledge is built through regular feedback between observations and interpretations over time by different people in different places.

At the community meeting, which frequently lasts from early morning until well after sunset, there are no formal means by which attendees offer information or opinions—people who wish to share their perspective simply begin by describing their observations. Other members, both men and women, chime in with supporting or conflicting accounts. Discussions are often negotiated by *puifama atesu'cho* capable of translating knowledge into action. For example, in response to declines in some large bird species, this leader may propose a limited take for a more sensitive species (e.g., Piping guan, Table 1) while keeping other large bird species (e.g., curassows) open for harvest. In this way, they couple the expert hunter's ecological knowledge with actions that are acceptable to the broader community in order to care for both community and wildlife. This process also functions as a form of joint learning where empirical observations are exchanged, interpretations debated, and reflections expressed. When conducted repeatedly over time, information shared becomes embedded in social memory, or the collective knowledge of the group (McIntosh 2000). Social memory supports knowledge transmission and the long-term communal understanding of ecological dynamics (Berkes 2009).

Eventually, a basic consensus emerges. If there is little or no opposition, the matter will come to a vote, in which the president will ask each community member whether or not they will abide by the prohibition. If a majority answers yes, the prohibition takes written form and becomes a rule that is applied equally to all community members and backed up by collective enforcement practices, explained below. The continued interplay of these interrelated components—where individual and group observation and interpretation leads to ecological monitoring and knowledge production that inform decision-making which changes over time on the basis of additional observation and interpretation—constitutes the crux of adaptive management. Through the reaffirmation of social ties and interdependence, the Cofán seek to avoid traversing thresholds that threaten the persistence of species important to subsistence livelihoods.

Table 1
Broad categories and descriptions of se'pi'cho

Category	Description
Users	Only *socios* are allowed to harvest resources within the territory, speak at community gatherings, and vote on the adaptation of various rules. All *socios* must follow *se'pi'cho*, and any guests are under the supervision of the family with whom they are visiting.
Activities	The commercialisation of all forest-products is prohibited (e.g., game meat, turtle eggs, lumber). Fishing with dynamite or artificial poison is also prohibited, and the use of natural fish poisons is allowed only in ponds left at the end of the flood season, and never in moving water.
Boundaries	Spatial prohibitions recognise three areas: (1) a small area along the Aguarico River for intensive use (e.g., dwelling-construction, gardening), (2) a larger area for subsistence activities (e.g., hunting, fishing, gathering), and (3) an even larger reserve area that functions as a source for game populations [Figure 1]. This system has been altered in more complex ways so that certain species (e.g., primates and curassow) are not hunted in specific areas (e.g., along the Zábalo River).
Species	A number of species are never killed. Such a prohibition on an animal is the result of various factors, including a response to population decline, tourism related value or interest, or out of fear of retaliation by supernatural agents. Prohibited species include: Jaguars, river otters, Giant armadillos, anteaters, caiman, river turtles, dolphins, anacondas, macaws, kingfishers, Tiger herons, hoatzins, and eagles, amongst others.
Harvests	Several species can be killed only in limited numbers. For example, a family can only kill three Piping guans (Cofán: *coyovi*; Scientific: *Pipile cumanensis*) and three Woolly-monkeys (*con'sin; Lagothrix lagotricha*) per season (see below). Species like White-lipped peccary (*munda; Tayassu pecari*) were previously limited on a per outing or per hunting party basis. Households were also prohibited from killing additional White-lipped peccary if it still had meat from a previous trip, resulting in a temporal spacing of hunting trips. These rules have since been adapted in response to the return of large herds.
Seasons	Some species can only be hunted during certain months of the year, which correspond to the seasons when those species are in their best condition (e.g., when fruits are abundant and animals are robust). This practice promotes consumption when the animal is fattest and, presumably, tastes best (e.g., Woolly monkeys can be killed in May and August and Piping guans in October).
Broadening opportunities	In order to create economic opportunities through tourism, it is prohibited to kill many charismatic species (e.g., river otters) and birds (particularly along the Zábalo River) in order to promote high encounter possibilities for tourists. In the reserve areas, scientific research activities are permitted in order to expand work opportunities and partnerships with academic institutions and conservation organisations.

Breaking these rules is considered a direct action against the well-being of the community. Because *se'pi'cho* are determined by the community and for the community, breaking the rules signifies a transgression against the community itself. Infractions are often admitted immediately but are also discovered through gossip channels. Any violation requires open acknowledgment during the community meeting. In public, community leaders question the accused individual, who responds, usually with an admission. Noncompliance results in a monetary fine. While the base amount has shifted over time, subsequent fines for the same infraction double each time, escalating far beyond the means of many families to pay them. In addition to this financial burden, reprimand in front of the entire community is embarrassing, something that all residents prefer to avoid.

Many elements of *tsampima coiraye* and *se'pi'cho* manifest characteristics identified as supportive of successful common property regimes: secure land tenure, clear delineation of boundaries, monitoring, matching rules to reflect local needs and conditions, and enabling those affected by rules to participate in modifying them (e.g., Ostrom 1990, 2010). They also have many parallels to adaptive management, an established conservation practice in which knowledge and institutions are examined and revised through a constant process of learning-by-doing and learning in response to change (Berkes et al. 2000). Beyond these parallels, it is important to note that *tsampima coiraye* and *se'pi'cho* are motivated by moral understandings of care, good relations, reciprocal responsibilities, and *opatssi* values.

Communicating care

The people of Zábalo *tsampima coiraye* and practice *se'pi'cho* by themselves and for themselves, without a need to communicate its structure or its outcomes to outside audiences. As Christie (2007: 88) states: "They can teach it, they can tell stories about it...but they may have no impulse to explain it." While Cofán knowledge related to these institutions has been primarily performative (e.g., knowledge as enacted rather than abstracted) and language barriers have limited its communication, *puifama atesuye* offers a new means to communicate Indigenous stewardship practices stemming from care in mutually-beneficial conversations with Western conservationists. Here we summarize key aspects of *tsampima coiraye*, drawing inspiration from Indigenous scholarship (e.g., Whyte and Cuomo 2016).

Unique to the Cofán of Zábalo, *tsampima coiraye* is an expression of self-determination focused on the right to serve as responsible stewards of their territory. The Cofán fought for a space where an *opatssi* lifestyle is possible. An ethos of care was born out of a desire to maintain abundance, connections, and relationships. Some residents of Zábalo recognise their responsibility as *tsampima coirasundeccu* with a moral duty to safeguard resources for future generations. For others, however, their responsibilities within the community are more pragmatic as they seek to maintain a satisfactory lifestyle of conviviality and abundance, where *se'pi'cho* is simply a rule of daily life to be respected. They recognise their place in the community and in the broader forest as connected: the decisions they make regarding the *añacho* that they hunt and eat, for example, impact the health of the community, the forest, and future generations.

In our efforts to communicate *tsampima coiraye*, we emphasise that these systems are dynamic, with an ability to respond and adapt to change. *Se'pi'cho* has been practised for four decades, with many of its original designers now in the late stages of their lives. These elders depended on the forest

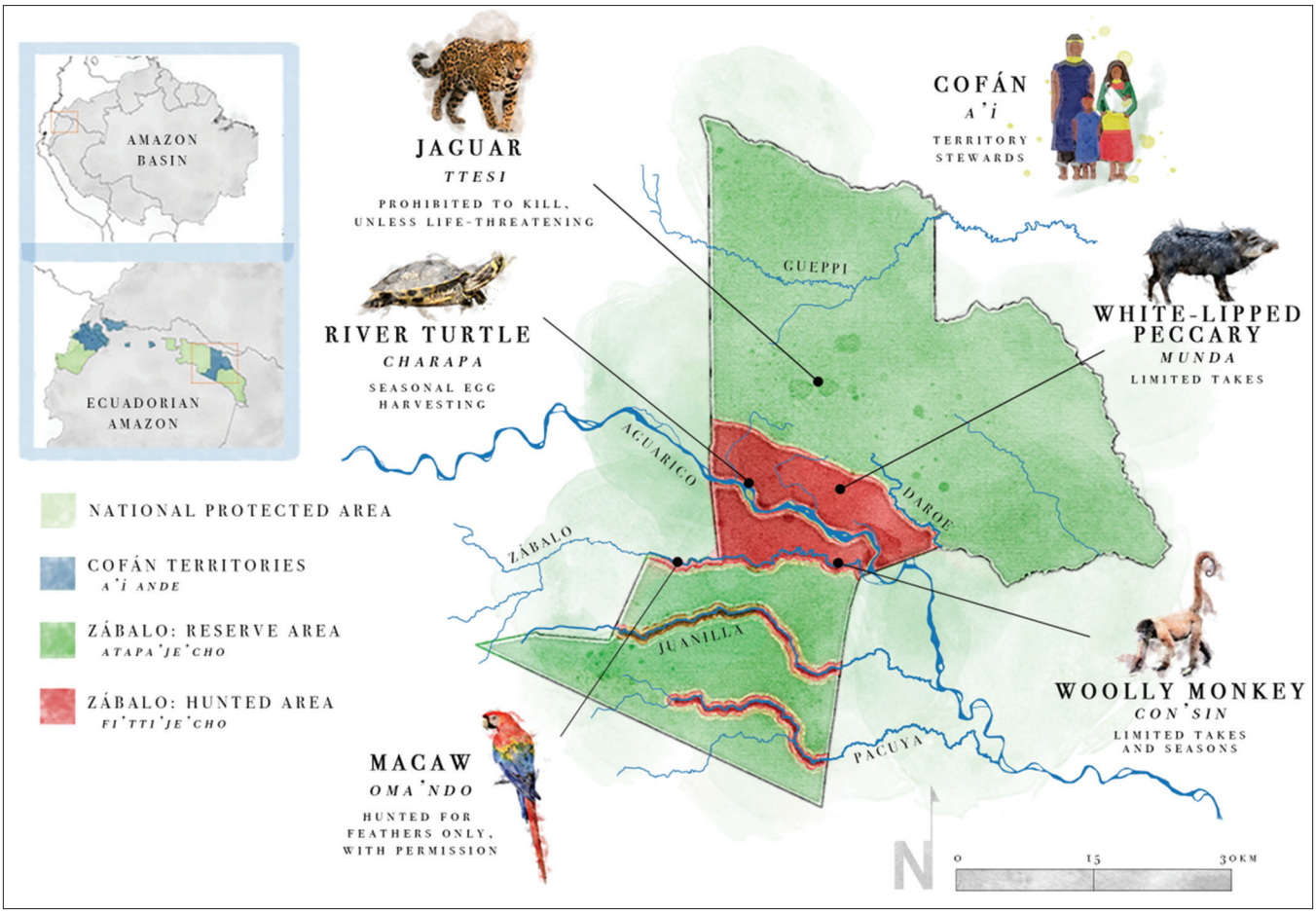

Figure 1
Map of se'pi'cho spatial restrictions and examples of species-specific rules in the Cofán territory of Zábalo

for their livelihood and regularly practiced *yagé* (or curing by a shaman using the vine, *Banisteriopsis caapi*), which furthered their connection to humans, non-humans, and the supernatural. The younger generation of Zábalo rarely drink *yagé*, hunt and fish less frequently than their parents, and often believe that they understand modern issues (e.g., market economies, the politics between Cofán territories) to a greater degree than their elders. Despite these changes, *tsampima coiraye* and *se'pi'cho* continue to be recognised and respected by all Zábalo residents. A new cadre of leaders, those trained to be *puifama atesu'cho* are in the making, earning advanced degrees in diverse disciplines so as to support their community navigate these challenges. Ultimately, we are confident that *tsampima coiraye* has become a moral responsibility that maintains the Cofán's connections to other Cofán, non-human beings, and the *tsampi* (forest).

CONCLUSION

Rather than "dismiss understandings that do not fit their own" (Berkes 2018: 12), Two-World Knowledge focuses on constructing knowledge through connection. How we construct knowledge—such as through connection or separation, thoughtful deliberation or top-down expediency—has significant implications with respect to the construction of power relationships. Essentialised, tokenised, and peripheralised, Indigenous science has occupied a marginalised position relative to Western science. Western approaches to conservation have much to gain from Indigenous systems grounded in deep collective histories, situated with the intricacies of particular places, and reflective of cultural values and understandings. Many Indigenous nations refer to the importance of an ethos of care (Wildcat 2013; Whyte et al. 2016), a way of being in the world. These ethical relationships are embedded in kinship and genealogical connections to everything in the world such that each person has a relationship of reciprocity with all other species (Whyte et al. 2016). This starkly contrasts with protectionist approaches that manifest a rejection and withdrawal of care for people in conservation areas.

To understand the emergence, expression, and expansion of collective care, we explored the changing social-ecological and institutional context in which the Cofán forged new alliances, negotiated with, and sometimes resisted, outsiders, and successfully established systems based in cultural tenets of behaviour akin to adaptive management. Cofán conservation emerged in response to a desire to maintain abundance following the dramatic transformations and

colonisation of their ancestral territory. The Cofán of Zábalo experienced the impact of oil exploitation and environmental devastation, but responded in ways that reflect their values of abundance, conviviality, and thriving (*opatssi*) rather than scarcity, damage, and deficit. In seeking out this abundance, a group of Cofán from Dureno relocated to Zábalo, where they were able to secure legal communal tenure and adapt previously held cultural traditions. *Se'pi'cho*, for example, is built upon a cultural practice respected over millennia to maintain Cofán identity as *tsampima coirasundeccu*. After nearly 40 years, *se'pi'cho* continues to dynamically structure Cofán subsistence. *Se'pi'cho*, like any other collective effort at sustainable environmental governance, is dynamic and necessitates revision and reaffirmation. In addition to these community-based controls, the Cofán have also been successful in excluding outsiders from entering their territory, be it through acts of resistance or park guards who patrol current territorial boundaries. Overall, the Cofán of Zábalo have developed diverse intuitions that function at different scales in order to maintain their lands and livelihoods.

The Cofán, and Indigenous peoples more widely, do not have uniform or static aspirations in regards to environmental management. Diverse cultural, political, and economic factors motivate Indigenous resource management approaches and, as a result, their goals may differ or even conflict with conservation priorities (Brondizio and Le Tourneau 2016; Garnett et al. 2018). Indigenous conservation practices also vary across time and space in response to dynamic social-ecological conditions. For example, a society may conserve a specific resource or area but not others; a group may regulate resource use during one period of time but not another. Our future research examines the emergence, expression, and efficacy of such heterogeneity among different Cofán communities, and the implications for pan-Cofán environmental and political efforts to confront contemporary challenges.

Author contributions statement

MSE conceived and designed the work, collected and analysed the data, and led the writing of the manuscript. FBQ supported data collection efforts in Zábalo and provided ethnographic insights at each stage of the manuscript preparation. FL provided theoretical guidance and helped write the manuscript. All authors contributed critical, intellectual content to the drafts and gave final approval of the version to be published.

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Declaration of competing/conflicting interests

The authors declare no competing interests in the conduct of this research.

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Research ethics approval

This research was approved by the University of Florida's Institutional Review Board (IRB201600819) and by the community of Zábalo during yearly meetings and through the articulation of a research agreement. This manuscript has been approved for distribution by Cofán leadership and community members.

Data availability

The data is not accessible due to privacy restrictions.

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