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LANDSCAPE ETHNOECOLOGY OF FOREST FOOD HARVESTING IN THE TALAMANCA BRIBRI INDIGENOUS TERRITORY, COSTA RICA

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There is a vast literature on Bribri people's food harvesting, but this literature has largely overlooked how Bribri people interpret their food harvesting practices. Using a landscape ethnoecology approach, we worked with Bribri colleagues to describe forest food harvesting in one community (Bajo Coen) within the Talamanca Bribri Indigenous Territory in Costa Rica. Sylvester spent nine months living and harvesting food with Bribri people, and carried out semi-structured interviews and focus group discussions to gather information. Our study revealed that harvesting food requires interacting with non-human beings to ensure harvesting is respectful of other Bribri worlds and Sibö's (the Creator) teachings. We also illustrate how harvesting and cultivating food in the forest is important to keep the land alive. Our study further revealed how farm and forest land patches are linked through Bribri harvesting. People plant cultivated species in forests and transplant wild species into farms. These practices are important to access food, to encourage animals in spaces near dwellings, and to keep the land alive. Lastly, we illustrate spatial and temporal links among the following activities: 1) polyculture and wild harvesting (of both plants and animals), 2) shifting agriculture and harvesting wild edible greens, and 3) hunting and harvesting wild greens. Our results are relevant to forest management because we provide information about Bribri harvesting practices that forest managers have committed to supporting but have reported lacking the information to do so.

Keywords: *hunting, La Amistad Biosphere Reserve, polyculture, shifting agriculture, wild food*

Hay una literatura vasta sobre la recolección de alimentos por el Bribri de Costa Rica, pero esta literatura carece en gran medida de una perspectiva Bribri. Utilizando un enfoque etnoecologíca, se trabajó con colegas Bribri para describir la recolección de alimentos en una comunidad (Bajo Coen) dentro del Territorio Indígena Bribri Talamanca en Costa Rica. Nuestro enfoque fue etnográfico. Sylvester pasó nueve meses viviendo y cosechando con colegas Bribri y llevó a cabo entrevistas semiestructuradas y grupos de discusión para recopilar información. Nuestro estudio reveló que la recolección de alimentos requiere la interacción con seres no humanos para asegurar que la cosecha es respetuoso de los otros mundos Bribri y de las enseñanzas de Sibö (el Creador). También ilustramos que es importante tanto la recolección como el cultivo de alimentos en el bosque para mantener viva la tierra. Nuestro estudio reveló además que las tierras agrícolas y forestales están vinculados a través de la cosecha Bribri. Las personas cultivan especies agrícolas en parches de bosque y cultivan especies silvestres en sus fincas; estas prácticas son importantes para acceder a alimentos, para atraer a animales silvestres a los espacios cercanos a las viviendas, y para mantener viva la tierra. Por último, revelamos vínculos espaciales y temporales entre las siguientes actividades: el 1) policultivo y la recolección silvestre, 2) la agricultura en rotación y la cosecha de plantas silvestres, y 3) la cacería y la cosecha de plantas silvestres. Nuestros resultados son relevantes para el manejo forestal por dos razones. Primero, algunas actividades de cosecha Bribri descritos aquí no están permitidos actualmente en la gestión forestal. Segundo, proporcionamos información sobre las prácticas de cosecha Bribri que los gestores forestales se han comprometido a apoyar, pero han reportado que carecen de la información para hacerlo.

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Introduction

Forest-dwelling people harvest from a broad landscape and make use of a diversity of land patches, including farm plots, fields, forests (and their margins), roadsides, river edges, ditches, degraded areas, and walking paths (Price and Ogle 2008; Rocheleau and Edmunds 1997). Landscape ethnoecology has been suggested as a tool to understand how people use these different harvesting spaces (Johnson and Hunn 2010). A landscape ethnoecology approach encourages researchers to document emic descriptions of resource harvesting systems (Johnson and Hunn 2010). A landscape-level approach further helps to demonstrate how resource use is shaped by creation history, relationships among human and non-human beings, and land ethics and values (Cajete 2000; Davidson-Hunt and Berkes 2003; Houde 2007; Johnson and Hunn 2010; McGregor 2008).

Understanding the landscape ethnoecology of forest food harvesting is central to responsible land management. Forest managers are increasingly shifting their focus to the management of landscapes (e.g., Frost et al. 2006), despite a long history of managing forests in isolation from other land patches. This landscape focus has encouraged the development of policies that attempt to manage land for people, food, and biodiversity conservation; however, our ability to construct effective policies requires additional information on how forests, along with other land patches, contribute to people's food systems (Frost et al. 2006; Sunderland et al. 2013).

To contribute to the published literature on landscape ethnobiology and to produce information relevant to land management, we examined the landscape ethnoecology of Bribri food harvesting in Costa Rica. Our specific objectives were to describe, 1) the relationships Bribri people form with forest species and the land, 2) the ethics and values that inform food harvesting, 3) the forest food species people harvest, and 4) where people harvest these foods. Although the published literature on Bribri food harvesting has focused mainly on either documenting lists of species people use (e.g., Altrichter 2011) and/or providing etic descriptions of the harvesting system through systems ecology approaches (e.g., García-Serrano and del Monte 2004; Harvey et al. 2006; Ocampo 1994; Ocherton 2005; Posas 2013), our research describes Bribri interactions with their landscape from an emic perspective.

The landscape ethnoecology of Bribri forest food harvesting is relevant to land management in Costa Rica. The Talamanca Bribri Territory is part of La Amistad Biosphere Reserve, a protected area designed to be managed for multiple lands uses, including the human use of forest resources (SINAC 2012; UNESCO 2014). La Amistad managers have made a commitment to support Bribri access to the natural resources traditionally harvested from forests, but these managers lack information on the species people use and how these species are accessed (SINAC 2012). Our research can be used to create directives to manage forests in La Amistad Biosphere that explicitly respect Bribri rights to access food and to continue food harvesting.

Methods

The Talamanca Bribri Indigenous Territory and the Bajo Coen Community

The Bribri Talamanca Indigenous territory (hereafter Talamanca Bribri territory) is located in the Talamanca county and the Limón province in the southeastern region of Costa Rica. Bribri people have lived in the Talamanca region since time immemorial. In 2011, there were 7772 Bribri people living in this territory (INEC 2013). The Talamanca Bribri territory borders and overlaps with Costa Rica's largest national park, La Amistad International Park (hereafter La Amistad Park [SINAC 2012]). Along with La Amistad Park, the Talamanca Bribri territory is part of the La Amistad Biosphere Reserve (UNEP 2013). This biosphere received UNESCO World Heritage status in 1982.

We worked in the Bajo Coen community, which is made up of approximately 45 households located in Alto Talamanca. Like other communities in Alto Talamanca, Bajo Coen residents use forests for all aspects of their food systems, and forests provide fuel and water for all food preparation. Forests are also sites of shifting agriculture and other farming that occurs in the margins of forests. The majority of Bajo Coen residents work in export agriculture (bananas, plantains, and cacao) and a handful earn income as teachers and or laborers (unpublished household survey data, 2012).

Research Partnership and the *Sẽ́bliwak* Women's Group

This research emerged from a collaboration between the authors, who from 2009–2015 worked together to define the project's objectives, develop its methods, and analyze and interpret data. In the Bajo Coen community, the authors partnered with the *Grupo de Mujeres Sẽ́bliwak* (hereafter the *Sẽ́bliwak* group). This group is composed of ten primary members (nine females and one male). García Segura's relationships and role within the Bajo Coen community facilitated the development of this partnership. Specifically, he has been selected by Bajo community leaders and Elders to guide Bribri research and he has done so for over 20 years and he has also worked with the *Sẽ́bliwak* group since it was formed 15 years ago.

Information Gathering and Research Colleagues

Participation formed the primary data gathering method during the research, as this is the traditional way Bribri teach others about the land and gives a holistic appreciation of the day-to-day Bribri life. The data gathering, via participation, was done by Sylvester, with García Segura providing insight during the analysis phase.

In order to experience the less visible dimensions of harvesting, Sylvester lived with a Bribri family in the Bajo Coen community for a period of nine months during 2012 (March-December) and again for a total of two weeks in 2013 (during May and December). This allowed her be directly involved with the day-to-day harvesting and to learn about harvesting from the point of view of her Bribri colleagues. Working with a group of 16 community members, 12 of whom were also members of the *Sẽ́bliwak* group (Table 1), she participated in harvesting

Table 1. People who participated in this research.

Name	Affiliation	Interviews
Ms. Ana Grisel Díaz	*Sẽbliwak* women's group	12/07/12
Mr. Ancelmo Diaz	-	29/06/12 and follow up interview on 15/08/12
Mr. Sabino Díaz	*Sẽbliwak* women's group	Group interviews on 26/03/12 and 07/08/12
Mr. Adenil García	*Sẽbliwak* women's group	-
Mr. Hernan García	*Sẽbliwak* women's group	Group interviews on 14/07/12 and 31/08/12
Ms. Alejandra Hernández	*Sẽbliwak* women's group	-
Ms. Karen Hernández	*Sẽbliwak* women's group	-
Ms. Nimfa Hernández	*Sẽbliwak* women's group	29/05/13
Mr. Saul Lek	*Sẽbliwak* women's group	-
Ms. Ana Yorleni Morales	*Sẽbliwak* women's group	Group interview 20/06/12
Ms. Vicenta Morales	*Sẽbliwak* women's group	-
Mr. Bernardo Sánchez	*Sẽbliwak* women's group	06/05/12 and group interview 20/06/12
Mr. Rudy Sánchez	-	28/08/12
Ms. Anastasia Segura	-	-
Ms. Sebastiana Segura	*Sẽbliwak* women's group	29/04/12, 21/06/12, a follow-up interview on 14/12/13, and group interviews on 26/03/12, 14/07/12, 07/08/12, and 31/08/12
Mr. Juradir Villanueva	Resource guard, member of the Bajo Coen community council (*consejo de vecinos*)	24/06/12, 01/11/12

activities including market agriculture, agriculture for local food consumption, wild food harvesting, shifting agriculture, and hunting. While working with the *Sẽbliwak* women in group agricultural projects (at least 3-4 times a week), she was also able to experience other parts of these women's daily lives, such as starting the fire before sunrise, visiting family and friends of group members, attending doctor visits, working in schools making food for the students, feeding animals, cleaning the home, and preparing an evening meal. Three hunters also allowed her to visit and learn about some of their hunting routines.

The overall goal of participation was to record detailed information involving the kinds of species harvested, harvest location, practices and land ethics association with harvesting, and the role of non-humans in the harvesting process. This information was later clarified with group members for any concepts or practices that were not fully understood during the participation events. For those concepts that involved complex Bribri thought processes, Sylvester was able to unpack these in-depth with two Bribri community members, Ms. Sebastiana Segura (interpreter during the research in Baja Coen) and Mr. Alí García Segura (co-author).

To expand upon what was learned during the participation phase, semi-structured, conversational interviews were conducted in Spanish, using Bribri language when there was not an acceptable Spanish translation. Ms. Segura and Mr. García Segura assisted by further analyzing these concepts when necessary. Conversational interviews allowed participants to have control over what they wished to share while respecting people's desires to share stories (Kovach 2009). Eleven individual interviews and six group interviews were completed with seven

community members (Table 1). These interviews were carried out either in participants' homes or at a location of their choosing and followed a predetermined set of questions relating to people's engagement in wild plant harvesting, hunting, polyculture, and shifting agriculture, the physical spaces people harvest in, and the practices, ethics, and values associated with harvesting (Table 1). Additionally, seven focus groups were held specifically with members of the *Sẽ́bliwak* group.

Information Analysis

The following codes were used to analyze notes and interviews: 1) cosmology, 2) polyculture, 3) shifting agriculture, 4) hunting, and 5) wild plant harvesting. Specifically, data were analyzed for recurring topics, similarities and differences among and within topics, and for in vivo codes (i.e., codes that emerge from the data that are often specific to local language or local practices [Ryan and Bernard 2003]). This process was important to flesh out the original a priori codes into new codes that reflected the nuances of our data. These new codes are used to organize the results section of this paper.

Results

The Land and All of its Beings

Understanding Bribri harvesting requires understanding the different Bribri worlds. The land was created by *Sibö* (the Bribri Creator) as four connected worlds: 1) *Mikã̀ Kṍ bákiã tsétsè*, "when the world was dark" or "the dark world," 2) *Kṍ ñíketché*, "the world where the things were becoming light," 3) *Mikã̀ Kṍ ñiné e'tã*, "the light world," and 4) *Sula' kṍska*, "the world where souls go." The "light world" is what human beings experience in their day-to-day life, that is, what you would see if we walk out on the land to harvest a plant. The other worlds are connected to the light world but are not visible to the naked eye.

Connections between the light and dark worlds are most relevant to Bribri harvesting (Figure 1). Specifically, every being in the light world is also a being in the dark world. For instance, a yucca plant (*Manhiot esculenta*) found in a farmer's field is actually a fish in the Bribri dark world. Similarly, a peach palm fruit (*Bactris gasipaes*) in the light world is a sloth in the dark world. Harvesting must be done in a way that is respectful to all the beings within these two worlds (e.g., to both the yucca and the fish).

Hunting exemplifies how relationships with beings in other worlds are formed and respected during harvesting. When hunting, people interact with *Dualök*, a non-human being who is the protector of all the animals. Respect for *Dualök* has many levels. Hunters must ask *Dualök* permission to hunt; hunters must not be boastful about what, when, and where they hunt; and hunters must only take what is needed. Over coffee on August 15, 2012, Elder and hunter Mr. Ancelmo Díaz explained this concept of respect:

> *Hay que ir con mucho cuidado al bosque y no hay que decir donde nos vamos o decir que vamos a cazar…también hay que cuidar porque todo animal tiene dueño*

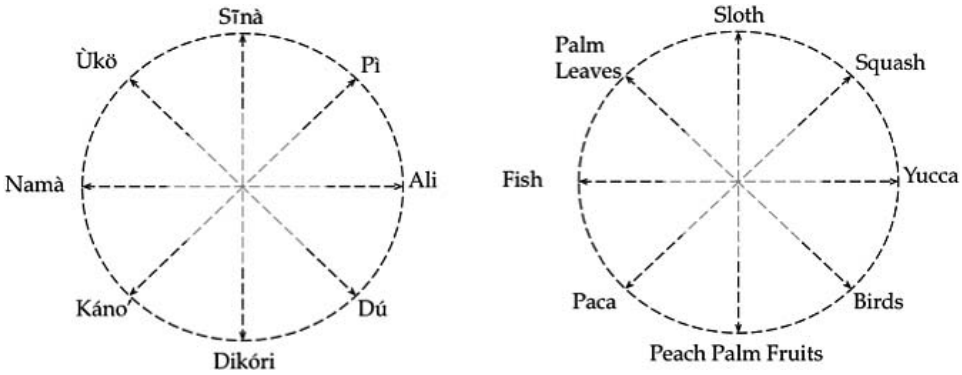

Figure 1. Connections among non-human beings in Bribri light and dark worlds. Names written in Bribri (left) and in English (right).

> *y si cazamos diez tepezcuintles lo ponemos en un saco el dueño se enoje y peor si lo vendemos…nosotros podemos cazar uno pero tiene que ser con respeto para su dueño.*
>
> We have to go into the forest with a lot of care, we should not say where we are going or say what we will hunt…we have to be careful too because every animal has its owner or protector, and if we hunt ten paca, and we put them in a sack, then the owner will get mad, and it would be worse if we sold this meat…we can hunt one animal but it has to be done with respect for its owner.

While Sylvester was interacting with hunters, she experienced this respectful behavior towards *Dualök* first hand. Initially, when she saw hunters get ready to go to the forest, she would ask where people were going to hunt or what species they would hunt. Her colleagues always responded in similar ways. For instance, when asked where they were going, they told her, "*ye' míã kṍbatà wéblök*" ("I am going to look at the mountain"). Or, when asked what they would hunt, they replied, "*voy a ver lo que hay*" ("I am going to see what's there"). An experienced hunter in his early thirties, Mr. Juradir Villanueva, later explained why people responded in this way. He said, if you are going to hunt, hunters will not say the name of this animal, but they may use the name of the animal in the way *Dualök* sees it:

> *Si ud. va a cazar ud. dice que va a buscar como tu' o ud. va a buscar frijol o ud. si, o si no a la gente que no lo entiende dice voy a ir a la montaña y ya voy a andar ya ellos saben que voy a ir a montear…a un mayor o una persona que sabe ud. le dice asi Ye' miã̃ ẽ wéikɔ̀k átu, voy a ver si hallo frijol, es decir tepezuintle. Es q todo tiene su regla y uno tiene que ir con esta respeto…es como un costumbre que se debe guardar.*
>
> If you are going to hunt you should say that you are going to look for something like *tu'* [a root vegetable] or beans, or if someone does not understand this, you say I am going to the mountain or I am going to walk, and then they know that you are going to hunt…To an Elder or someone who knows you can say something like this, '*Ye' miã' wéikɔ̀k*

> *átu*,' I am going to look for beans, but you are really talking about a paca. Everything has its rules and you have to go out on the land with this respect …it is like a tradition that we have to keep (interview 01/11/2012).

The principles of respect demonstrated during hunting apply to other wild resources. For example, while Sylvester and Ms. Segura were on their way to work in the banana fields, Ms. Segura was searching for "*bicha*" (*Lycianthes* sp.) a medicine for a sick family member. To find this plant, they stopped by her mother's house to ask her where to find this plant. Ms. Segura's mother answered that they knew where to find it but she could not tell them the location of this plant. She later explained that it was not appropriate to talk about where this medicine was to be collected because its protector in the other world could perceive talking about its harvest as being boastful. As a result, this plant's protector could hide it or render it not suitable for harvest.

These examples of hunting and harvesting demonstrate a strong sense of connectivity among the land and the non-human beings with whom Bribri share the land. These examples show how finding foods and medicines is more than factual knowledge about what species to harvest and where to harvest them. Harvesting is about building relationships that invoke all of creation (i.e., the natural and spiritual worlds [McGregor 2008:145]). To harvest, one does not simply remember teachings and use knowledge about an animal or a plant to find it. Harvesting requires engaging the non-human beings in different Bribri worlds, and the harvester's relationships with these beings can affect the harvesting plants and animals.

Harvesting Activities and Landscape Associations

Polyculture

Contrary to published literature (e.g., García-Serrano and del Monte 2004), our colleagues did not describe polyculture as associated only with farms and/or gardens. Instead, people described polyculture as the basis of Bribri landscaping, in farms, along pathways, in spaces designated for shifting cultivation, in forest margins, and in forests. In Bajo Coen, polyculture is practiced across the landscape. For the nine months Sylvester cultivated the land with the *Sẽ́bliwak* women's group, she worked in nine different plots owned by members of this group; these plots were found in the lowlands as well as in forest margins and forest edges. A list of the plants cultivated and/or tended in the field for banana export agriculture (Table 2) illustrates a fraction of the diversity of wild and agricultural species identified while working in nine plots (a total of 9 hectares of land). In these plots, wild and cultivated species intermix because women and men 1) plant and care for both wild and cultivated species, 2) transplant forest species into their plots, and 3) transplant species acquired through exchange into plots.

Shifting Cultivation

Tȅ̀ is the Bribri word that refers to spaces where shifting cultivation is practiced. Corn, beans, and rice are the primary crops cultivated in these spaces, and

Table 2. Plant food species cultivated and/or tended in fields used for banana export agriculture. Cultivated species refers to those species planted in plots. Tended species refer to those that are wild and are cared for and not eliminated from plots during regular plot maintenance. Species organized by type of food (root vegetables or fruit) and then alphabetically by scientific name. This is not an exhaustive list but rather it comes from working with a group of 12 members of the *Sẽ bliwak* women's group in one hectare banana plots (a total of 9 hectares of land). Species found in the table are those our colleagues pointed out as edible during a period of eight months of research in 2012.

Bribri name	Scientific name	English common name or varietal name	Cultivated	Tended
Root vegetables				
Tu'	*Diocorea* sp.	-		X
Ali	*Manihot esculenta*	Manioc	X	
Tu'	*Xanthosoma* sp.		X	
Fruit				
-	*Annona muricata*	Soursop		
Pruta	*Artocarpus altilis*	Breadfruit		
-	*Averrhoa carambola*	Star fruit		
Diko'	*Bactris gasipaes*	Peach palm	X	X
-	*Carica papaya*	Papaya		
Dapa'	*Capsicum* sp.	Chili pepper		
Dapa' blóblo	*Capsicum* sp.	Sweet pepper		
Yawö	*Chamaedorea tepejilote*			
Àsh	*Citrus* sp.	Orange	X	
Àsh blóblo	*Citrus limmeta*	Sweet lemon		
Àsh shkőshkö	*Citrus* sp.	Lime		
-	*Cocos nucifera*	Coconut		
Kàpi	*Coffea arabica*	Coffee	X	
Kàpi	*Coffea* sp.	Coffee	X	
Bókõn	*Couroupita* sp.			
-	*Eugenia stipitata*		X	
Skő tsuru'	*Herrania purpurea*			
-	*Inga edulis*	Ice cream bean		
Kã'	*Iriartea deltoidea*			
Skőkichő				
	Jacaratia dolichaula			
Tsála	*Musa* sp.		X	X
Chãmù Tsrulu	*Musa acuminata* Colla	Gros Michel banana	X	
Chãmu	*Musa acuminata* Colla	Cavendish banana	X	
Pilipita	*Musa acuminata* Colla		X	
Cuadrado (Spanish name)	*Musa acuminata* Colla		X	
Mána	*Musa acuminata* Colla		X	X
Congo (Spanish name)	*Musa acuminata* Colla	Congo banana	X	
Chopo morado (Spanish name)	*Musa acuminata* Colla	X	X	
Chopo (Spanish name)	*Musa acuminata* Colla	X		
	Nephelium lappaceum	Rambutan	X	
Jamo'	*Persea americana*	Avocado	X	
Shũlẽ	*Psidium guajava*	Guava		
Kalóm	*Pouteria sapota*	Mamey sapote		
-	*Quararibea cordata*	South American sapote		
Mo'wö	*Renealmia alpinia*			X
Biriba (Spanish name)	*Rollinia mucosa*		X	
Páköl	*Saccharum* sp.	Sugar cane		
Kúk	*Socratea exorrhiza*			
-	*Spondias purpurea*			
-	*Syzygium malaccense*	Malay apple		

Table 2. Continued.

Bribri name	Scientific name	English common name or varietal name	Cultivated	Tended
Skuàlö	*Theobroma bicolor*		X	
Tsuru'	*Theobroma cacao*	Cocoa	X	
Sànalwö	*Urera baccifera*			

are grown for both household consumption and for sale within the community. Previous descriptions of *të̀* include lists of the species found in these land patches as well as the durations of burning, planting, and fallow periods (e.g., García-Serrano and del Monte 2004). Our research adds to this work by providing a cultural context for the harvesting of these resources.

In Bajo Coen, *të̀* are not spaces limited to one specific geographic location or ecosystem. People make use of their private lands for shifting agriculture in locations commonly distant from dwellings to keep domestic animals away from crops. While Sylvester lived in Bajo Coen, shifting agriculture was practiced in forest margins and in fields in the lowlands that have been historically used for this practice (e.g., an area of land called *La Isla*, which is one of many naturally formed river islands; Figure 2). Colleagues explained that shifting agriculture does not occur in forest interiors because *Sibö* did not create forest interiors for shifting agriculture.

Wild Harvesting across the Landscape

Hunting takes place across the landscape in land patches both close to and far from dwellings and in land-use areas that were both minimally to highly modified (e.g., agricultural fields or forests; Table 3). The hunters described hunting within their community on private land (e.g., in home gardens, shifting fields, and forest margins) and on community land (e.g., forests, river islands). Some hunters explained that they still traverse old trading and harvesting routes and hunt along these paths; the longest of these harvesting routes extends from the Caribbean side of the Talamanca mountain range to the Pacific coast on the other side of the Talamanca mountain range, a path that can take weeks to complete.

Our colleagues explained how hunting can depend on the landscaping practices people use to attract animals. Growing crops such as corn at forest margins and planting fruit trees across the landscape are two examples of how wild animals are drawn into spaces near dwellings where hunting can occur. Scholars described this Bribri practice as a form of "enriching" the land to attract wild animals (Posas 2013:9). The peach palm is one example of a fruit tree cultivated across the land in Bajo Coen specifically to attract animals for hunting. When walking through Bajo Coen, it is possible to find peach palms in all land patches from forest interiors to field margins. When peach palms are fruiting (starting July and August and lasting until around October), mammals frequent areas near these trees to feast on their fatty and calorie rich fruits; this is a period of the year when animals can be seen close to people's dwellings. Other fruit trees people planted to attract animals included a diversity of banana varieties (*Musa acuminata spp.*), cacao

Figure 2. (a) *Tẽ*, a space on Elder's land in Coroma, August 7th 2012. (b) Visiting a family friend's cornfields with Mr. Hernan Segura (in picture) within forest margins in Coroma, August 31st 2012. Source: Olivia Sylvester.

(*Theobroma cacao, Theobroma simiarum*, and/or *Theobroma bicolor*), avocado (*Persea americana*), and zapote (*Pouteria* sapota). Land used for shifting agriculture is important for hunting because animals can be found there eating planted crops.

While hunters described types of land patches or routes where hunting has taken place, hunters did not describe specific hunting localities. The lack of specific hunting localities was because hunting depended on many factors that may not be the same on each hunting trip. For instance, hunting depends on an animal's movements that can be related to the seasonal cycles of certain fruit trees animals consume. Hunting also depends on the protector of the animals, that is, a hunter's relationship with this protector can shape whether or not the protector will provide an animal for them. Lastly, hunting localities are not always described because, as discussed above for plants, talking about these localities in detail can be considered boastful and disrespectful to the protector of the animals.

Bribri wild plant harvesting in Bajo Coen can happen in almost any space across the landscape (Table 4). Wild harvesting can occur in less-modified land patches (e.g., forests, river islands), in more modified land patches (e.g., fields), and in in-between spaces (i.e., forest or field margins, river edges, roadsides, or degraded areas, and pathways between houses [Rocheleau and Edmunds 1997:1355]). Shifting agricultural fields were unique sites of wild food harvesting. Specifically, two species of wild edible greens (*rpő* [C*yathea* sp.] and *balòkè* [*Phytolacca rivinoides*]; Figure 3) thrive with disturbance; thus, after a shifting agricultural field is cleared and/or burned, these edible greens will grow alongside corn or other agricultural species planted. Our colleagues described how these are two popular species of edible plants because they are some of the only greens in Bribri diets.

Lastly, hunting animals and harvesting wild plants are two practices that can be complementary. While hunters are on the land, they frequently wear special bags called *skùla* that are specifically designed to carry wild plant foods and medicines when people are hunting. Because hunting and harvesting activities are complementary, Bribri traditional recipes often used a combination of wild meat and wild greens in the same dish; these recipes generally involved boiling wild meat with root vegetables and wild greens that people have collected while out on the land (Figure 4).

Harvesting and Keeping the Land Alive

Our colleagues described how everything on the land has a purpose. One of the purposes of plants and animals is to be used as food, and one of the purposes of the land is to produce food. Ms. Segura explained how cultivating the land is one way to ensure that the land fulfils its purpose, because cultivating the land is imperative to ensure that the land stays healthy and alive. Similarly, it is important to harvest plants and animals to ensure they fulfill their purpose. If species are not harvested and consumed, beings in the other world can interpret this as though these species are not serving their purpose. As a result, the land itself may stop producing these species. Thus, harvesting needs to be understood not only as an activity to access food, but one that helps plants, animals, and the land to serve their purposes. Harvesting is also an activity that will help ensure that food species will be available to Bribri people for generations to come.

Table 3. Mammals, reptiles, and birds harvested in Bajo Coen forests and forest margins organized alphabetically by scientific name. This species list is not exhaustive but reflects the species hunted by the people we worked with in Bajo Coen. Other hunters in this community and in other Bribri communities may specialize in hunting different species.

			Use			Land patch type		
Bribri name	**Scientific name**	**Common name**	**Food**	**Healing**	**Forest**	**Forest margin**	**Agriculture**	**Other**
Mammals								
Sar	*Allouata palliata*	Mantled howler monkey	X		X			
Sinà sarùrù	*Bradypus variegates*	Brown-throated three-toed sloth	X	X	X	X		
Blùr	*Cabassous centralis*	Northern naked-tailed armadillo		X	X			
Sinà tsikirìrì	*Choloepus hoffmanni*	Hoffmann's two-toed sloth	X	X	X	X		
Káno'	*Cuniculus paca*	Paca	X		X	X	X	
Tsawì	*Dasypus novemcinctus*	Nine-banded armadillo	X		X	X	X	
Shùlë	*Dasyprocta punctata*	Agouti	X		X	X	X	
Namù dalòlò	*Herpailurus yagouaroundi*	Jaguarundi	X		X			
Skula'	*Hoplomys gymnurus*	Armored rat	X					
Namù	*Leopardus pardalis*	Ocelot	X		X	X	X	
Sũlĩ màt	*Mazama Americana*	Red brocket	X		X	X		
Tsí	*Nasua narica*	White-nosed coati	X		X	X	X	
Sũlĩ	*Odocileus virginianus*	Whitetail deer	X		X			Land patch across river called *La Isla*
Káchu'	*Potos flavus*	Kinkajou	X		X	X	X	
Skula'	*Proechimys semispinosus*	Tome's spiny rat	X		X			
Skõ batẽ	*Sciurus variegatoides*	Variegated squirrel	X		X	X	X	
Sawë	*Sylvilagus brasiliensis*	Forest rabbit, Tapeti	X		X	X	X	
Urrì	*Tamandua mexicana*	Northern Tamanudua	X	X	X			
Nai'	*Tapirus bairdii*	Baird's tapir	X		X	X	X	
Kásir	*Tayassu tajacu* L.	Collard peccary	X		X	X	X	
Reptiles								
Sũlĩtchabë	*Boa constrictor*	Boa constrictor	X	X	X			

Table 3. Continued.

Bribri name	Scientific name	Common name	Use			Land patch type		
			Food	Healing	Forest	Forest margin	Agriculture	Other
Talók kuë̀	*Chelydra rossignonii*	Central American snapping turtle	X	X				River edge
Buà	*Iguana iguana*	Green iguana	X			X		River edge
Birds								
Duwé̋	*Crax rubra*	Great curassow	X		X	X		
Manósh	*Ortalis cinereiceps*	Gray-headed chachalaca						
Kaë	*Penelope purpurascens*	Crested guan	X					
Tő̋köl	*Phalacrocorax brasilianus*	Neotropic cormorant	X				River edge	
Kayö̀	*Pionus menstruus*	Blue headed parrot	X		X	X	X	
Kayö̀	*Pionus senilis*	White-crowned parrot	X		X	X	X	
Bitsĭ̋k	*Pteroglossus torquatus*	Collard Aracari	X		X	X	X	
Tsiö	*Ramphastos sulfuratus*	Keel-billed Toucan	X		X	X	X	
Urĕ́k	*Ramphastos swainsonii*	Chestnut-mandibled Toucan	X		X	X	X	
Kő̋lī tsiö	*Selenidera spectabilis*	Yellow-eared toucanet	X	X	X	X		
Tsurìrërë	*Tinamus major*	Great tinamou						

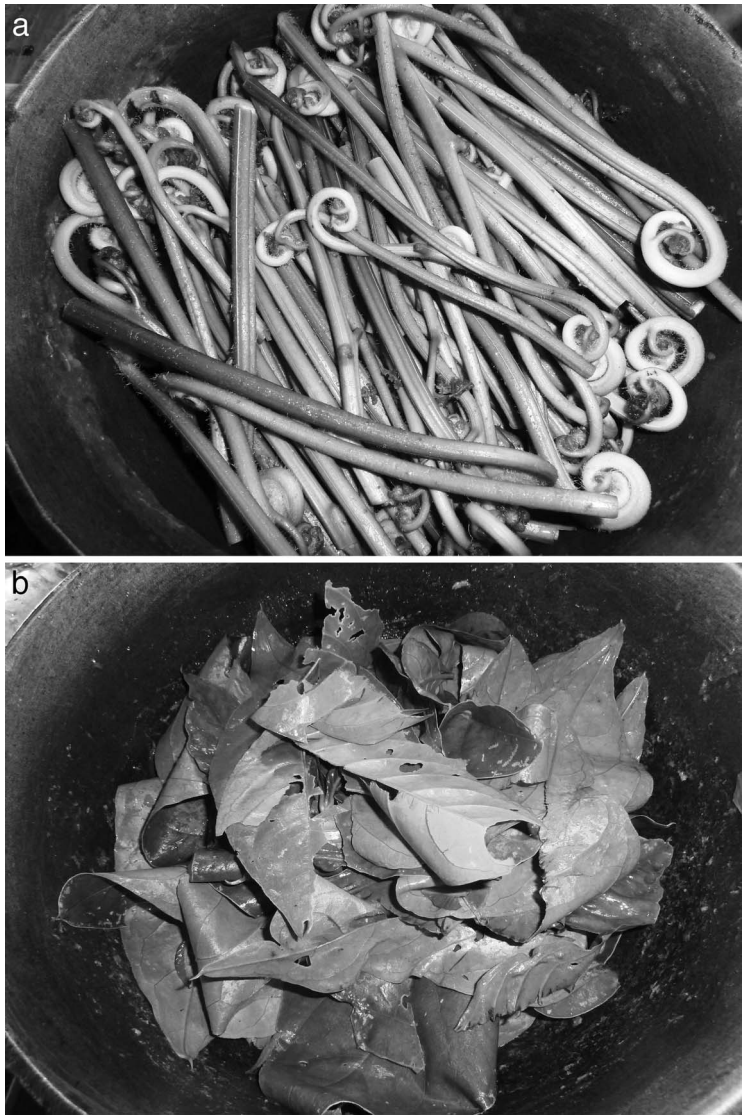

Figure 3. Examples of *Àr*, young edible plant parts, found growing on land that had been recently worked or disturbed. (a) The *rpö̀* (*Cyathea* sp., Cyatheaceae) was harvested while hunting, and (b) the *balòkò* (*Phytolacca rivinoides*, Phytolaccaceae) was harvested in shifting agricultural fields. Source: Olivia Sylvester.

Harvesting and Identity

Polyculture, shifting agriculture, and wild harvesting were often described in relation to Bribri identity. For instance, when Sylvester asked the members of the *Sẽ́bliwak* group why it was so important to do polyculture, they all responded in a similar way: that polyculture was part of their identity as a Bribri person. Ms. Vicenta Morales García, explained how polyculture is "…*algo muy propio del*

Table 4. Examples of wild Bribri edible plant species and their landscape associations. Species organized alphabetically by scientific name. These plants together are called *àr*, a Bribri term that can be translated to edible tender plant parts and that is often used to refer to edible wild plants.

Bribri name	Plant part consumed	Scientific name	Landscape association
Tchã́màwö	Inflorescence	*Carludovica sp.*	Encouraged near dwellings and in forests
Yawö	Inflorescence	*Chamaedorea tepejilote*	Planted and encouraged near dwellings and in forests
Tű́slàk	Inflorescence	*Cryosophila warscewiczii*	Encouraged near dwellings and in forests
Rpò̀	Fiddlehead	*Cyathea* sp.	Associated with shifting agriculture, timber harvest, and disturbance
Pő́	Inner stem	*Heliconia mariae*	Encouraged in forest margins
Skő́kichő́	Fruit	*Jacaratia dolichaula*	Encouraged near dwellings and in forests
Balòkò	Leaves	*Phytolacca rivinoides*	Growth associated with shifting agriculture, timber harvest, and disturbance
Mo'wö	Fruits/seeds	*Renealmia alpinia*	Encouraged near dwellings and in polyculture planting
Sànalwö	Flowers	*Urera baccifera*	Encouraged near dwellings and in polyculture planting

Indigena es algo que no se puede abandonar nunca, hay que mantenerlo todo una vida,", "something very characteristic of an Indigenous person, it is something we can not abandon ever and we need to maintain this practice for our whole lives" (group interview 7/11/2012). Ms. Segura further explained how polyculture is one of the fundamental ways to distinguish between outsiders (*síkua*) and Bribri

Figure 4. A meal prepared by Ms. Sebastiana Segura and Sylvester of peccary meat (*Kásir* or *Tayassu tajacu*), wild edible flowers (*Sànalwö* or *Urera baccifera*), peach palm fruits (*Dikóri* or *Bactris gasipaes*), and boiled plantain (*Kalő́m* or *Musa acuminata* sp.). Source: Olivia Sylvester.

farmers. She explained that outsiders farm to make the most profit out of a land patch, whereas Bribri farmers base farming on the teachings of *Sibö*. Bribri farmers, she said, will always choose multi-cropping even if it comes at an economic cost. Ms. Segura took Sylvester to her banana fields to explain these differences:

> Sibö *nos hizo a los Indígenas diferentes a ustedes los blancos, nosotros nos hizo pobres en cuestiones económicos pero ricos en terrenos y comida…Por ejemplo este terreno si los blancos lo trabajan en poco tiempo seria muy ricos en plata pero nosotros no.* Sibö *nos enseño trabajar la tierra así cultivando banano,* dikórpó, *guanabana, cedro, laurel, limón. Y gracias a* Sibö *nosotros casi no pasamos con hambre puede ser si no hay carne uno se busca* dikóli, *o* dikórpó *o otra cosa.*
>
> *Sibö* made us Indigenous people different from white people, he made us poor in economic terms but rich in land and food…take for example this land, if white people worked it in a very short period of time they would be rich in money but for us this is not the case. *Sibö* taught us to work the land like this, growing banana, peach palm, guanabana, cedar, laurel, and limes. And, thanks to *Sibö*, it is rare that we are hungry, even when there is no meat one can come here and harvest peach palm or heart of palm or something else (interview 29/04/15).

Discussion

Our research contributes to better understanding of how diverse land patches and harvesting activities contribute to Bribri food systems (Borge 2011; García-Serrano and del Monte 2004). It emphasizes connections between farm and forest harvesting, activities that are often described in isolation from one another (e.g., Altrichter 2011; Bharucha and Pretty 2010; Harvey et al. 2006), but that are critical in Indigenous people's food harvesting systems (e.g., Alcorn 1981). By examining connections among farm and forest harvesting activities, we illustrate how polyculture, shifting agriculture, and wild harvesting can occur in overlapping spaces and within the same harvesting journey. Specifically, we reveal important spatial and temporal links among the following activities: 1) polyculture and wild harvesting (of both plants and animals), 2) shifting agriculture and harvesting wild greens, and 3) hunting and harvesting wild plants.

Harvesting supports Bribri people's continued access to wild and cultivated food. People help wild plants grow by clearing space around them, pruning them, and transplanting these plants from forests to other land patches (e.g., banana farms, gardens). People also plant cultivated plants (e.g., bananas, peach palms, cacao) in forest patches to increase access to these foods and to encourage wild animals near dwellings. These harvesting practices have been described elsewhere for Bribri and other Indigenous people (e.g., Huastec Maya in northeastern Mexico [Alcorn 1981]); however, our work links harvesting practices to Bribri land ethics and teachings, and to people's relationships with non-human beings in other Bribri worlds.

Using participation as a research method was important to ensure we described the harvesting system from the perspective of Bribri people.

Participation did not mean just following people on paths; it meant that Sylvester (as a non-Bribri researcher) learned new ways of trekking, hearing, smelling, and feeling surroundings (e.g., Pink 2009). Participation allowed Sylvester to slow down and pay attention to the less visible day–to-day activities that take place during harvesting; examples of these activities include tending to wild plants as she walked to a friend's house or using unique language when talking to people before hunting to ensure respect for *Sibö* and other non-human beings. Tim Ingold and Lee Vergunst (2008:3) explained how it is easy for researchers to dismiss the aspects of the day-to-day in favor of reporting on "what really matters," or what is on the researcher's radar. In Sylvester's case, what was on her radar at the beginning of her research was documenting what species people used and where people harvested them. As she began to walk at the pace of her colleagues, she learned about the rich teachings that are shared before harvesting and/or en route to harvesting an animal or a plant; these types of teachings can be easily overlooked without participating in people's day-to-day lives (Davidson-Hunt and Berkes 2010; Hunn 2007; Johnson 2010; Pink 2009; Toledo 2002).

Our findings are relevant to forest management. The Bribri Indigenous Territory is part of La Amistad Biosphere Reserve, a protected area designed to be managed for multiple lands uses including the human use of forest resources (SINAC 2012; UNESCO 2014). However, forest managers in this biosphere report a lack of information regarding how people use the forest landscape as well as what harvesting activities are central to Bribri identity (SINAC 2012). Our research reveals that Bribri access to food in forests depends upon their ability to continue 1) polyculture, both in lowlands and in forest land patches with different levels of disturbance (e.g., paths, forest margins, and forest interiors), 2) shifting agriculture (in lowlands, forest margins, and other forest patches), and 3) hunting (near dwellings, in agricultural land patches, and in forests). Since polyculture and wild harvesting are essential to Bribri identity, understanding these land use practices should be a fundamental to management plans.

Our results are particularly relevant to support Bribri people's rights to access traditional food. Two harvesting activities we describe as central to Bribri identity and to food access, hunting, and shifting agriculture, are heavily restricted in forest management in the Talamanca Bribri Territory (SINAC 2012). Our findings illustrate how these activities not only provide people with access to meat and agricultural species, but how these activities are associated with harvesting wild edible greens, traditional food species that can be key sources of protein and micronutrients (Fa et al. 2003; Golden et al. 2011; Grivetti and Ogle 2000; Powell et al. 2013). Our findings can be used by forest managers to revise management plans to ensure these plans support rather than hinder Bribri access to species important for nutrition as well as cultural identity.

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research colleagues provided their ongoing, informed consent and chose to have their names beside the insights they shared.

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