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ABSTRACT

AN ETHNOECOLOGICAL AND ETHNOBOTANICAL STUDY OF THE MAIJUNA INDIANS OF THE PERUVIAN AMAZON

by Michael Patrick Gilmore

The Amazon basin is one of, if not the most, botanically diverse regions of the world. Unfortunately, Amazonian floristic and habitat diversity is relatively poorly known and understood. Indigenous peoples have highly detailed and extensive biological and ecological knowledge of the rain forest and studying these knowledge systems can provide insights into the heterogeneity and diversity of Amazonian forests. The research reported here investigates several aspects of the traditional culturally-based biological and ecological knowledge of the Maijuna Indians of the Peruvian Amazon.

An ethnoecological framework is utilized to examine the classification, significance, and use of habitat types recognized by the Maijuna. The objectives of this portion of the dissertation are to: (1) document the habitat classification system of the Maijuna; (2) understand how they use the culturally-based habitat types, and their associated resources, seasonally and temporally; and (3) document the ecological knowledge and management strategies associated with each habitat type. The Maijuna have a complex and extensive habitat classification system identifying more than 70 forest and non-forest habitat types within the Sucusari River basin. The results of this portion of the research provide valuable insights into how indigenous peoples perceive, use, and manage resources and habitat types in Amazonia.

An in-depth analysis of the significance of a habitat that the Maijuna call **mañaco taco** is also made. **Mañaco taco** are dominated by the small myrmecophytic tree or shrub *Durioa*

hirsuta (Rubiaceae) and have a very open understory. The Maijuna have well-defined and constructed supernatural beliefs associated with these forests, believing that they are the home of malevolent supernatural beings. Understanding the significance and importance of habitat types to indigenous peoples is critical in discerning how they perceive and interact with these areas.

A case study of resource use of a culturally important and necessary activity, canoe construction, was also undertaken and is discussed in detail. Canoes are amongst the most important and integral parts of the life and subsistence strategies of the Maijuna and other residents of the Peruvian Amazon. An ethnobotanical framework is utilized to: 1) examine the use and importance of canoes to the Maijuna; 2) understand the cultural and historical context of canoe construction; and 3) document the steps and plants used in constructing canoes.

AN ETHNOECOLOGICAL AND ETHNOBOTANICAL STUDY OF THE MAIJUNA INDIANS OF THE PERUVIAN AMAZON

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Chapter 1: Introduction

The Amazon basin harbors at least 30,000 plant species (Gentry 1982), making it one of, if not the most, botanically rich regions of the world. Unfortunately, the forests of Amazonia remain poorly understood. For example, plant species composition within the Amazon basin remains relatively understudied (Nelson et al. 1990; Shepard et al. 2001; Terborgh and Andresen 1998; Tuomisto 1998), as do species distributions and habitat diversity (Condit 1996; Fleck and Harder 2000; Shepard et al. 2001, 2004; Terborgh and Andresen 1998; Tuomisto 1998; Tuomisto et al. 1994). In addition to being a biologically diverse region, the Amazon basin is also very culturally diverse. For example, Amazonia is currently home to 379 indigenous groups which represent 87 percent of all indigenous groups in South America (Lizarralde 2001). Unfortunately, both biological and cultural diversity within the Amazon basin is being threatened and lost at an alarming rate. For example, in total, an area of rain forest larger than France has already been destroyed (Moran 1996; cited in Lizarralde 2001: 266) and 80 different indigenous groups in Brazil alone went extinct in the twentieth century (Lizarralde 2001). At this rate, a significant amount of plant species and indigenous groups could become extinct before an even basic understanding of their complexity can be amassed or documented.

Indigenous and folk societies have highly detailed ecological and biological knowledge and systematic studies of these knowledge systems can provide important insights into the heterogeneity and diversity of Amazonian forests (Frechione et al. 1989). As Shepard et al. (2001: 32) state, elaborating upon Posey (1983), "Indigenous and folk knowledge about the environment represents a vast and underutilized database about habitat diversity, species distributions, ecological interactions among organisms, economically important species, and

sustainable management practices." Understanding and documenting this knowledge can also, most importantly, provide meaningful long-term benefits to indigenous groups. For example, documenting traditional ecological and biological knowledge systems can provide indigenous groups with a permanent record of this knowledge for their descendants. Unfortunately, the study of traditional biological and ecological knowledge is at a critical stage. Due to a variety of reasons (e.g. shifts in subsistence patterns, participation in the Western educational system, and habitat loss), traditional knowledge is on the decline (Lizarralde 2001). Today, younger generations of indigenous peoples know less and less of the traditional biological and ecological knowledge of their elders which ultimately does not bode well for the future.

In this dissertation, I investigate the traditional culturally-based biological and ecological knowledge of the Maijuna Indians (a Western Tucanoan group) of the Peruvian Amazon. Specifically, the Maijuna habitat classification system was examined in detail and an in-depth analysis of canoe construction was also completed. Before this investigation, the Maijuna had never been the subject of an intensive ethnoecological or ethnobiological study, and therefore little was known about their ecological knowledge and perceptions, and their plant and animal use. Overall, this study fills a gap that previously existed in the ethnobiological and ethnoecological record of the Maijuna and it also increases scientific knowledge of how indigenous peoples perceive, use, and manage resources and habitat types in Amazonia. This study will also provide the Maijuna with meaningful long-term benefits. At the end of this study, several copies of the translated results will be provided to the Maijuna ultimately serving as a permanent record for Maijuna descendants. This is especially meaningful considering the fact that a substantial amount of traditional knowledge is not being passed down from the older to the younger generations.

In Chapter 2 of this dissertation, I utilize an ethnoecological framework to examine the classification of both forest and non-forest habitat types by the Maijuna. What is ultimately provided is an emic, as opposed to an etic, description of the Maijuna habitat classification system. Compared to other areas of study in the fields of ethnobiology and ethnoecology, little research has been completed to date on indigenous habitat classification systems (Shepard et al. 2001; Sillitoe 1998). In addition to merely providing a static description of the Maijuna habitat classification system, the use and significance of the different habitat types is also discussed. This information is critical in understanding how indigenous peoples actually perceive and interact with the different habitat types that they classify.

An in-depth analysis of one habitat type is discussed in Chapter 3. This habitat was used as a case study to better understand the significance and use (or lack thereof) of habitat types identified by the Maijuna. The cultural beliefs associated with this habitat are discussed in detail, ultimately giving a voice to the Maijuna. This chapter also further builds the case for the "avoidance island" concept coined and defined in chapter 2. In addition, this chapter also presents and documents an important traditional Maijuna story that is no longer being told and passed down to younger generations and is therefore only known by a few Maijuna elders.

In chapter 4, I use an ethnobotanical framework to examine the use, construction, and importance of canoes among the Maijuna. This research is a case study of resource use in regards to a culturally important and required activity. Canoes were chosen for this portion of the study because they are a very important and integral part of the life and subsistence strategies of the Maijuna. There are no roads within Maijuna communities and therefore canoes are an absolutely essential item; they are used for hunting, fishing, traveling, communication, socialization, and the gathering of various forest products, among many other things. To

properly understand the significance of canoes to the Maijuna, the ethnohistory of canoes and the cultural context of canoe construction are also discussed.

In Chapter 5, I summarize and synthesize the results presented in this dissertation and discuss their overall significance. The potential collaborative nature of future ethnobiological and ethnoecological research with the Maijuna is also discussed.

To properly situate this dissertation, an in-depth description of the Maijuna, the study site, and the Maijuna orthography used throughout this dissertation immediately follow.

The Maijuna

The Maijuna (Mai huna) are a Western Tucanoan people (Bellier 1993a, 1994; Gordon 2005; Steward 1946) presently found in the northeastern Peruvian Amazon. According to Bellier (1994), there is no doubt that the Maijuna are a Tucanoan people given the structure of their language, the etymology of Maijuna words, and their kinship system, among other things. Overall, twenty five languages have been classified as Tucanoan (Gordon 2005). In addition to Maijuna, several other extant and extinct languages are classified as Western Tucanoan, such as Koreguaje, Macaguaje, Secoya, Siona, Tama, and Tetete (Gordon 2005). The Maijuna language is classified by itself in the southern division of the Western Tucanoan languages whereas the other Western Tucanoan languages listed above are classified in the northern division (Gordon 2005).

Like other indigenous groups, the Maijuna are known by a variety of different names within the literature. The most common names for the Maijuna in the more recent literature are Orejón or Coto (Koto), whereas Payagua is the most common name used for the Maijuna in the very early literature (Bellier 1993a, 1994; Steward 1946). The name Orejón is of Spanish origin

and literally means “big ears” which is in reference to the large balsa wood ear disks that Maijuna men traditionally wore (Bellier 1993a, 1994; Steward 1946; Velie 1975). The name Orejón has produced a considerable amount of confusion due to the fact that it was given to a number of different indigenous groups in South America that also wore ear disks, including a nearby Witotoan speaking tribe (Bellier 1993a, 1994; Steward 1946). The name Coto is the Quechua word for the red howler monkey (*Alouatta seniculus*) referring to the old Maijuna custom of painting their bodies red with *Bixa orellana* L. (Bellier 1993a, 1994; Velie 1975). Marcoy (1866: cited in Bellier 1994: 37), who traveled by the general area of the Amazon, Napo, and Putumayo rivers between 1848-1869, also notes that they were given the name Coto for their excellent imitation of the red howler monkey call. Similarly, Velie (1975), in reference to the name Coto, also mentions the Maijuna custom of singing in a monotonous melody for many hours in the night. The name Maijuna has a different origin than the other names previously mentioned due to the fact that it is an auto denomination. The name Maijuna will be used throughout this dissertation due to the fact that the names Orejón and Coto are derogatory and considering the fact that the people themselves use and prefer the name Maijuna.

Bellier (1993a, 1994) provides a very detailed ethnohistorical account of the Maijuna showing that the Orejón, Coto, and ultimately the Maijuna are descendants of the Payagua. As Bellier (1993a, 1994) details, this transition is the result of migrations and intraethnic and interethnic relations and interactions. A brief summary of her work follows to properly situate this dissertation.

During the 16th century the Western Tucanoans occupied an extensive area within the Amazon basin. According to Bellier, they were found in the area between the Napo and Putumayo rivers, in what is now part of Peru, and extended into the present day Columbian

regions of the Caguán and Caquetá rivers to the north and the Yarí River to the east (Figure 1-1). In 1682, Jesuit missionaries made contact with what they referred to as the "Provincia de Payahua" ("Province of Payahua") apparently in the region of the lower Napo River. According to captured individuals, this "Provincia de Payahua" consisted of 16,000 people. As Bellier states, historians consider this to be the first contact with the Payagua even though the location and cultural affiliation of the people contacted are rather vague. According to Bellier (1993a), given the large population size cited, the "Provincia de Payahua" mentioned by the Jesuits may have actually consisted of all of the different Western Tucanoan groups, and not just the Payagua, that inhabited the general area between the Napo and Putumayo rivers from its lower to its upper reaches. Due to a number of reasons detailed in her work, Bellier ultimately hypothesizes a northwestern origin for the Payagua and suggests that they arrived and settled in the general region of the lower Napo toward the end of the 17th century.

During the 18th century the Payagua were very geographically mobile and were in contact with a variety of Tucanoan and non-Tucanoan indigenous groups. In the beginning of the 18th century the work of missionaries intensified and the Payagua were affected by Franciscan missionaries to the north and Jesuit missionaries to the south. Generally speaking the missionaries were not very successful because the Payagua generally came to mission camps to obtain metal tools and then left soon after obtaining them. In addition, there were also epidemics that plagued this area and revolts because the Payagua were fearful of bad treatment and slavery. During this time period the Payagua population declined because of epidemics, poor living conditions in the mission camps, and internal wars due to traditional motives and to feed the slave market.

Toward the end of the 18th century a part of the Payagua were living in the area between the Napo and Putumayo rivers from the Tamboryacu River to the Ampiyacu River (Figure 1-1), an area that is recognized as traditional by the present day Maijuna (all four present day Maijuna communities fall within this area). According to Bellier, the ties between these southern Payagua and the Maijuna can be directly traced. Relations between the northern Tucanoans and the Maijuna weaken from the beginning of the 19th century. During this time period, the northern Payagua are no longer mentioned in the literature and, according to Bellier, they were divided or absorbed by the Tama, Macaguaje, and the Siona.

During the 18th century the Peruvian government began to promote and encourage the immigration of colonists, especially Europeans, into this region. The Jesuit missionaries were expelled from this region in 1768, marking the end of their influence on the Payagua. After the independence of Peru in 1824 the exploitation of indigenous peoples intensified. During this general time period, the first *patrones* settled in this region trapping indigenous peoples, including the Payagua, under their control for years to come. From the middle of the 1800's the names Coto and Orejón (along with other names) begin to be mentioned with increasing frequency within the historical record. The last known reference to the Payagua is during the early 1900's and their location corresponds exactly to that of the Coto and Orejón. From here on out, they would be known by the names that merchants and *patrones* gave them, such as Coto and Orejón.

The rubber boom that occurred during the late 1800s and early 1900s had a major impact (i.e. demographically, etc.) on the Maijuna and other indigenous groups of this region. During this time period the Peruvian government installed various *patrones* of different nationalities to oversee the land. With the land granted to these *patrones* came its indigenous residents, whom

they worked and controlled by force. During the rubber boom the Maijuna principally supplied steam ships with wood and also carried rubber between river basins (i.e. between the Putumayo and Napo rivers).

In 1925, Tessmann (cited in Bellier 1993a: 72, 1994: 37) spent time among the Koto and noted that they resided between the Napo and Algodón rivers. The Koto that Tessmann encountered were found near the Zapote lagoon (Zapote River) and along the Sucusari River (Figure 1-1). He noted that the Koto were also called the Orejón, due to their ear disks, and he goes on to mention that "in the old times" they were also called the Payaua, Payagua, and Tutapishco. According to the calculations of a colonist, there were approximately 500 Koto living in this general area at that time.

After the collapse of the rubber boom in the 1920s the Maijuna found themselves trapped working under a series of *patrones*. Several of these *patrones* were particularly brutal and they were ultimately responsible for decimating and killing the Maijuna of the Tacshacuraray River and Lagartococha and causing the Maijuna to flee from the Zapote River, all areas that the Maijuna traditionally inhabited (Figure 1-1). From the 1920s to the 1940s the Maijuna exploited leche caspi (*Couma macrocarpa* Barb. Rodr.), vegetable ivory from the palm *Phytelephas macrocarpa* Ruiz & Pav., and rosewood (*Aniba rosaeodora* Ducke) for the *patrones* that they worked under. During this time, they also hunted a variety of animals for their skins and fur. During the war with Ecuador in 1941, the government of Peru used the Maijuna to carry munitions and supplies to the soldiers, among other things. After the war the Maijuna worked for another *patrón* performing a variety of tasks, including the extraction of vegetable ivory, rubber, barbasco (*Lonchocarpus* sp.), and animal skins and furs. This same *patrón* also had the Maijuna working in the cultivation of sugarcane and the raising of cattle. More recently and

upon the phasing out of the exploitation of vegetable ivory, animals, rubber, and barbasco, the Maijuna worked under several other *patrones* logging commercially valuable timber species from their traditional territory.

From 1955-1975 a new outside influence descended upon the Maijuna. During this time period the Peruvian government and the Summer Institute of Linguistics (presently known as SIL International) entered into a formal agreement opening up the Maijuna to Protestant missionary influences and teachings. A bilingual Maijuna school was established at this time and the formal schooling of Maijuna children began. Toward the end of this general time period the Peruvian government officially recognized indigenous groups, defined their rights, and granted them ownership of land. It was also during this general time period that the Maijuna finally got out from under the control of the *patrones* that forcefully and relentlessly controlled whole communities of Maijuna individuals.

Currently, in total there are approximately 300 Maijuna individuals found along the Yanayacu, Algodón, and Sucusari rivers of the northeastern Peruvian Amazon (Bellier 1993a, 1994).[1] The Yanayacu and Sucusari rivers are tributaries of the Napo River and the Algodón River is a tributary of the Putumayo River (Figure 1-1). It is important to note that this is the general area that the Payagua have inhabited since at least the end of the 17th century and more specifically all of these rivers fall within the area that the southern Payagua lived in toward the end of the 18th century. There are four Maijuna communities located along the above-mentioned rivers, Puerto Huamán and Nueva Vida along the Yanayacu River, San Pablo de Totoya along the Algodón River, and Sucusari along the Sucusari River (Figure 1-1). All four of these communities are recognized as official Native Communities by the Peruvian Government and all have been granted title to parcels of land in which their respective communities are located

(Brack-Egg 1998). Unfortunately, the titled land that the Maijuna have received is a very small sliver of their ancestral lands.

It is important to note that both Velie (1975) and Bellier (1994) have found minor linguistic differences between the Maijuna of the Yanayacu, Algodón, and Sucusari rivers. Bellier (1994) also reports small variations in marriage, culinary, and ritual practices. Today, inhabitants of the three rivers have very little formal and informal contact with each other (Bellier 1993a, 1994; Gilmore pers. obs.). They are economically and politically independent from one another and they are not linked by formal and recurrent exchange.

Traditionally the Maijuna are organized into patrilineal clans that are named after plants and animals (Bellier 1993a, 1994). According to Bellier (1993a, 1994), the Maijuna recognize six clans in total, two of which have gone extinct due to a lack of members. Another one of these six clans currently only has a few representatives living in various mestizo communities along the Napo River. Members of this clan spoke Maijuna, were allied with clans presently found in Sucusari, but they apparently did not wear ear disks. Due to these reasons, Bellier (1993a, 1994) considers this clan to be on the periphery of the Maijuna as a whole. Clans practiced exogamy and uxorilocal residence upon marriage, ultimately dispersing the men of each patrilineal clan (Bellier 1993a, 1994). As Bellier (1994) notes, members of each clan had a characteristic manner of painting their faces and bodies but they did not have independent ancestors, stories, leaders, or territories.

According to Bellier (1993a, 1994), the Maijuna traditionally lived in large pluri-familial houses that were surrounded by small satellite houses ("mosquito houses"). Married couples slept in the satellite houses in the evening which were generally about 150 meters from the large communal house. Normal daily activities took place in the communal house during the day

which was also used for ritual purposes in the evening. These groups of houses (the large house with its small satellite houses) where found in interfluvial regions toward the headwaters of rivers and were approximately a days walk from other groups of houses. Each group of houses, considered a residential unit, conducted their activities within their own territory. According to Steward (1946), the large communal dwellings described above may in fact have been adopted later on by the Maijuna due to early missionary influences and the adoption of canoes, which facilitated larger settlements. Steward (1946) states that early Coto houses seem to have only sheltered single biological families instead of multiple families as Bellier (1993a, 1994) suggests.

The style of house and location of residence described by Bellier (1993a, 1994) as being traditional to the Maijuna were abandoned in approximately 1930 (Bellier 1993a, 1994). After this time the Maijuna moved along the lower parts of rivers and adopted a mestizo architectural style. According to Bellier (1993a, 1994) these changes were imposed on the Maijuna by missionaries and *patrones*, so they could better control them, and their adoption has ultimately led to the redistribution of social units. Currently the Maijuna live in mono-familial or pluri-familial houses that are arranged in groups that exchange products and services amongst themselves.

Traditionally, three positions of power coexisted in the Maijuna world, the 'civil chief', the 'war chief', and the shaman (Bellier 1993a, 1994). As mentioned above, residential units were traditionally dispersed from one another and, according to Bellier (1993a, 1994), each residential unit was led by a triumvirate of these three figures. As Bellier states, the 'civil chief' was known by various Maijuna names that can be translated as "the one that lives with the people", "the one that guides like a father", or "the one that has two or three wives" (curaca). The role of the 'civil chief' was to mediate disputes and resolve problems non-violently within

residential units. The ‘civil chief’ did not have any official supra-local power and only men held this position. The ‘war chief’, whose Maijuna name translates as “the one that teaches how to fight”, was a brave warrior who taught the art of combat to other men and led men into battle (Bellier 1993a, 1994).

According to Bellier (1993a, 1994), the shaman is the most powerful figure in Maijuna society and Maijuna shamans are capable of doing both good and bad. Maijuna shamans are also able to exercise the functions of ‘civil chiefs’ and sometimes are aggressive figures taking the place of warriors (Bellier 1993a, 1994). Shamans have several roles in Maijuna society, including a therapeutic role and a role in rituals, among other things. According to Bellier (1993a, 1994), although it is rare, women may also become shamans yet she does not state whether this is a traditional or more recent phenomenon. It is important to note however that Maijuna women are excluded from the ritualistic roles that male shamans participate in and they generally perform a therapeutic role instead of an aggressive one (Bellier 1993b). The traditional Maijuna power structure has changed significantly since approximately 1930 due to social changes (Bellier 1993a, 1994). As a result, the ‘civil chief’ and shaman continue to coexist, albeit in altered forms, with the modern political and power structure whereas the ‘war chief’ has completely disappeared from Maijuna society.

The Maijuna employ a variety of subsistence strategies, including hunting, fishing, swidden-fallow agriculture, and the gathering of various forest products. Traditionally, the Maijuna hunted arboreal animals, such as monkeys and birds, with blowguns (Bellier 1993b, 1994). Blowgun darts were coated with a poison made from a variety of plants and poisonous animals and insects (Bellier 1993b, 1994); the exact recipe for this poison has been lost in present times (Bellier 1993b, 1994; Gilmore pers. obs.). To hunt bigger game, the Maijuna

utilized a variety of different kinds of spears (Bellier 1993b, 1994). According to Bellier (1993b, 1994), these spears were made from palms of the genera *Bactris* and *Iriartea* yet according to an elderly Maijuna consultant that I interviewed spears were only made from the palm *Socratea exorrhiza* (Mart.) H. Wendl.. In addition to blowguns and spears, the Maijuna also traditionally constructed a variety of traps to catch birds and rodents (Bellier 1993b, 1994; Steward 1946). Today, Maijuna hunters no longer use blowguns and spears for hunting and instead use shotguns. Nonetheless, various types of hunting traps are still occasionally used by the Maijuna. Considering the fact that Maijuna women are prohibited from using shotguns and making traps, hunting is primarily the job of men (Bellier 1993b, 1994). However, according to Bellier (1993b, 1994), Maijuna women occasionally accompany men while hunting and also occasionally hunt, sometimes with the use of dogs, alone or with other women, for small animals close to houses and in well known areas.

According to Steward (1946), the Coto (Maijuna) traditionally used the bow and arrow and long basketry traps for fishing. He also cites the use of barbasco or fish poison among the Coto and states that they did not use spears or nets. Bellier (1993b, 1994) does not mention the traditional use of the bow and arrow or long basketry traps among the Maijuna for fishing. In addition, I have also never heard of or observed the use of these fishing instruments during my field work with the Maijuna and therefore their use should be questioned. Today, the Maijuna use a variety of instruments to fish, including hooks, spears, nets, machetes, and fish poison. Fishing is primarily a man's job yet women also occasionally fish (Bellier 1993b, 1994; Gilmore pers. obs.). It is important to note however that Maijuna women only use spears (Bellier 1993b) and machetes (Gilmore pers. obs.) on a limited basis for fishing. The Maijuna also practice swidden-fallow agriculture which has been described in detail by Bellier (1993b, 1994). As

Bellier notes (1993b, 1994), since the introduction of metal axes the Maijuna no longer use clubs and stone axes to clear fields, or the technique of felling trees by starting and maintaining fires at the base of their trunks. Both men and women are involved in the production and maintenance of fields yet their participation and the activities that they perform are sometimes specialized.

As previously stated, Tessmann (1930; cited in Bellier 1993a: 72, 1994: 37) spent time among the Koto in 1925 around the area of the Zapote lagoon (Zapote River) and along the Sucusari River (Figure 1-1). Tessmann provides a good physical description of the Koto (Maijuna) which Bellier (1993a, 1994) had translated from German and summarizes in her work. What follows is a summary of the physical description provided in Bellier (1993a, 1994) and ultimately in Tessmann (1930; cited in Bellier 1993a: 72, 1994: 37). When Tessmann encountered the Maijuna, men went naked, tying up their penis from the age of six years old, whereas Maijuna women wore large bark cloth shirts that were painted red. According to some consultants, these shirts were only worn by married women. Both sexes painted their bodies in various designs with *Bixa orellana* and *Genipa americana* L., blackened their lips with *Neea* sp., and lightly tattooed their faces. They also wore their hair long and depilated their eyebrows, temples, armpits, pubic region, and chin.

In addition, Tessmann also noted that Koto (Maijuna) men wore ear disks. These ear disks (up to several inches in diameter) were made from balsa wood, *Ochroma pyramidale* (Cav. ex Lam.) Urb., and were adorned with a black seed, from the palm *Astrocaryum murumuru* Mart., in the center (Bellier 1993a, 1994). According to Bellier (1993a, 1994), traditionally all Maijuna men wore ear disks and these ear disks symbolized for the Maijuna their identification with the moon which is the incarnation of their cultural hero **Maineno**. Boy's ears were pierced upon puberty which incorporated them into manhood. This act also conferred upon them a

certain status that made them symbolically equal with their cultural hero **Maineno** (Bellier 1993a, 1994). The piercing of a pubescent boy's ears occurred during "the ritual of the first pijuayo (*Bactris gasipaes*) fruits" and the ear disks were gradually enlarged over the years. Large ear disks ultimately symbolized the full moon. It is important to note that Maijuna women did not wear ear disks, only men were the bearers of this symbol and identity (Bellier 1993a, 1994). In approximately 1930, the Maijuna stopped piercing pubescent boy's ears and painting their bodies to minimize the disdain and scorn that they experienced from *patrones* and other outsiders (Bellier 1993a, 1994). According to Bellier (1994), the last two Maijuna men with ear disks died in 1982.

Like other Amazonian indigenous groups the present day Maijuna have been influenced and changed over the years by pressure from missionaries, the *patrón* system, the Peruvian Government, mestizos, the regional society, and the formal education system, among other things (Bellier 1993a, 1994). In addition, the Maijuna have also intermarried to a certain degree with mestizos and other neighboring indigenous groups (Bellier 1994; Gilmore pers. obs.). For these reasons, many Maijuna traditions and cultural practices are no longer practiced by the Maijuna or have been significantly altered. For example, most Maijuna children do not speak the Maijuna language and therefore many do not know the subtleties of Maijuna kinship terminology (Bellier 1994). Instead they prefer to use kinship terms from the Spanish language, and as Bellier (1994) notes, these two systems are not always compatible. Unfortunately, the erosion of language proficiency among Maijuna children is fueling the degradation and loss of traditional knowledge in general, and biological and ecological knowledge specifically (Gilmore pers. obs.).

In addition, the Maijuna also currently practice the system of *compadrazgo* which they adopted approximately 70 years ago from mestizos and Quichua speaking peoples (Bellier 1993a, 1994). *Compadrazgo* is a system of fictitious or spiritual kinship that has created new forms of social ties and alliances that compete with the traditional Maijuna kinship system. Unfortunately, many cases of *compadrazgo* between Maijuna individuals and mestizos are not equal, resulting in mestizos benefiting more and ultimately taking advantage of their Maijuna counterparts (Bellier 1993a, 1994). In addition, during recent times the traditional clan system of the Maijuna has been altered by the adoption and use of Spanish surnames that they inherited from their *patrones* (Bellier 1994). Unfortunately, the Peruvian government only takes down and recognizes these Spanish surnames and not their traditional clan names further devaluing and eroding Maijuna traditions. These are just a few examples of how Maijuna traditions have changed and evolved over the years.

The Maijuna face many challenges as they enter the future. To meet these challenges on their own terms and take control of their own destiny, leaders from the different Maijuna communities approached me in 2004 with the idea of starting up a Maijuna indigenous organization. The Maijuna have belonged to a number of regional indigenous organizations in the past yet they have not been satisfied with these organizations due to a perceived lack of action and progress. Through the initiative of the Maijuna and the work of all, the Federación de Comunidades Nativas Maijunas (FECONAMAI) was established on August 11, 2004. FECONAMAI is a Maijuna indigenous organization representing all four of the Maijuna communities. This organization is still in its infancy yet its three main goals are to: (1) conserve the Maijuna culture, (2) conserve the environment, and (3) to better organize all four of the

Maijuna communities. It is hoped and anticipated that this organization will meet the present and future needs of the Maijuna.

Maijuna Orthography

There have been two orthographies published for the Maijuna language. Daniel Velie produced a practical orthography for Maijuna while working for the Summer Institute of Linguistics (currently known as SIL International) from 1958 until his premature death in 1979 (V. Velie pers. comm.). He produced two pieces of linguistic work that have been published, including "Bosquejo de la Fonología y Gramática del Idioma Orejón (Coto)" ("Draft of the Phonology and Grammar of the Orejón (Coto) Language") (Velie 1975) and "Vocabulario Orejón" ("Orejón Vocabulary") (Velie 1981), which is a Maijuna-Spanish-Maijuna dictionary of common words. In addition, he also published a series of eight Maijuna-Spanish primers (Velie and Velie 1963a, 1963b, 1963c, 1963d, 1963e, 1964, 1966, 1967), a collection of Maijuna traditional stories (Velie and Ríos-Ochoa 1977), and another school book in Maijuna and Spanish (Velie and Velie 1962), all to be used in Maijuna bilingual schools.

Irene Bellier also produced a practical orthography for the Maijuna language to facilitate her anthropological research. The orthography that she produced is explained and used in two ethnographies that she has published about the Maijuna (Bellier 1993a, 1993b, 1994). Bellier (1993a, 1994) states that several problems were not resolved by Velie's work and notes three specific examples. According to Bellier (1993a, 1994), Velie produced an imperfect or incomplete phonological analysis, did not carry out a study of the tonal system or grammatical rules of Maijuna, and produced a dictionary that only contains the most common words. Unfortunately, Bellier (1993a, 1994) does not cite any of Velie's work and therefore it is unclear

whether or not Bellier has seen or considered Velie (1975). In the end, Bellier (1993a, 1994), with the help of the Amerindian Ethno-linguistic Team, attempted to correct the system of transcription produced by Daniel Velie and identify the linguistic units of Maijuna.

Even though Velie's work may be partially incomplete or imperfect in several ways, I chose to use the practical orthography that he produced throughout this dissertation for a number of reasons. First, all Maijuna individuals literate in Maijuna know and use the orthographic system produced by Velie and not Bellier because this is the system that was taught in Maijuna schools. Also, all Maijuna bilingual school books published (i.e. the primers, dictionary, etc.), and potentially available for use in Maijuna schools, utilize the practical orthography produced by Velie. Given this fact, any potential language preservation and revitalization efforts will have to be based on Velie's work and materials out of necessity and practicality. Taking this into consideration, Velie's orthography was used throughout this dissertation so that the results are accessible and potentially useful to the Maijuna themselves.

Throughout this dissertation, all Maijuna terms and names in the text, tables, and figures are in boldface type and are written using the practical orthography developed by Velie unless otherwise stated. During the course of this research project, I worked closely with Sebastián Ríos Ochoa (**Masiguidi Dei Oyo**), a Maijuna individual from the Sucusari community, to correctly and accurately transcribe all Maijuna terms using Velie's orthography. Sebastián Ríos Ochoa is perfectly literate in both the Maijuna and Spanish languages and worked closely with Daniel Velie during the end of his work with the Maijuna. A description of the practical orthographies developed by both Velie and Bellier follows.

The orthography developed by Daniel Velie:

The practical orthography developed by Velie (1981) consists of 27 letters that are pronounced as if reading Spanish, with the following exceptions: in a position between two vowels **d** is pronounced like the Spanish **r**; **ɨ** is pronounced like the Spanish u but without rounding or puckering the lips; and **a̲**, **e̲**, **i̲**, **o̲**, **u̲**, and **ɨ̲** are pronounced like **a**, **e**, **i**, **o**, **u**, and **ɨ** but nasalized. Also, the presence of an accent indicates an elevated tone of the voice; accents are only used when the tone is the only difference between two Maijuna words and the meaning of the word is not clarified by the context that it is found in. The 27 letters that make up the Maijuna alphabet are: **a, a̲, b, c, ch, d, e, e̲, g, h, i, i̲, j, m, n, ñ, o, o̲, p, q, s, t, u, u̲, y, ɨ, ɨ̲.**

The orthography developed by Irene Bellier:

The orthography developed by Bellier (1993a, 1994) differs with Velie's orthography in several ways as detailed by Bellier herself. First, Bellier replaced several of Velie's letters and letter combinations as follows: the **c** and **qu** with **k**, **j** with **h**, **ch** with **š** and **č**, and **gu** with **g**. In addition, Bellier also uses the symbol ~ over a letter (i.e. **õ**, etc.) to designate a nasalized sound instead of underlining the letter as did Velie (i.e. **o̲**, etc.); nasalized verbs and diphthongs are only designated or written when their nasal character is not determined by their proximity to a nasalized consonant. Bellier also reintroduced the **r** which is written as **d** in Velie's orthography; as Bellier states, the **r** alternates with **n** and **d** and the replacement is made in an inter-syllabic context. In total the system of transcription utilized by Bellier (1993a, 1994) consists of the following letters: **a, b, č, d, e, g, h, i, k, m, n, ñ, o, p, r, s, š, t, u, y, ɨ** (this list of letters does not include those letters that may be nasalized).

Bellier (1994) also states that there is a system of three tones within the Maijuna language but unfortunately she does not explain this system. In addition, Bellier (1994) notes that Maijuna is an agglutinative language, with morphemes joining in series into lexemes. Agglutinative languages form words primarily through agglutination, which is "the formation of words from morphemes that retain their original forms and meanings with little change during the combination process" (Morris 1981).

Study Site

All field research was conducted in Sucusari, a Maijuna community. Sucusari is located along the Sucusari River, a tributary of the Napo River, in northeastern Peru (Figure 1-2). The mouth of the Sucusari River is located approximately 120 kilometers by river (via the Amazon and Napo rivers) from Iquitos, the largest city and commercial center of the Peruvian Amazon. The main community of Sucusari is located approximately 6 kilometers by river from the confluence of the Sucusari and Napo rivers. This general region of Peru is tropical, warm, and humid, having a mean annual temperature of 26º C and a mean annual precipitation of almost 3100 mm per year (Marengo 1998). The general area of the Sucusari River is located approximately 100-200 meters above sea level (Tuomisto et al. 2003).

Sucusari is composed of 20 mono-familial or pluri-familial houses with 97 residents in total, the majority of whom are indigenous Maijuna (71% pure Maijuna and 12% at least one half Maijuna) (all figures from July 2001). Thirteen houses with 62 residents are located in or very close to the main community (where the school is located) whereas the other houses are spread out upriver for several kilometers. Sucusari is recognized as an official Native

Community by the Peruvian Government and in 1978 was granted title to 4,771 hectares (Brack-Egg 1998), a small fraction of their traditional land.

There are no other communities located along the Sucusari River yet there is an ecotourism lodge (ExplorNapo Lodge) located approximately 1 to 1.5 kilometers by river from the mouth of the Sucusari River (and therefore 4 to 4.5 kilometers downriver from the Sucusari community) (Figure 1-2). ExplorNapo Lodge was originally established along the Sucusari River in approximately 1983 and is owned and operated by Explorama Tours, an ecotourism company that owns several lodges in the Peruvian Amazon within the general vicinity of the city of Iquitos (Castner 2000). Surrounding ExplorNapo Lodge are several reserves, owned and operated by Explorama Tours, that adjoin the titled land of the Sucusari community along its southern border. The CONAPAC Reserve, established in the early 1990s, formerly adjoined both the titled land of the Sucusari community and the reserves of Explorama Tours to both the east and north. This reserve consisted of 100,000 hectares (250,000 acres) (Castner 2000) and extended toward the headwaters of the Sucusari River to the north and the Apayacu River to the east. CONAPAC, an acronym that stands for Conservación de la Naturaleza Amazónica del Perú A.C., is a Peruvian non-governmental and non-profit organization completely and directly funded by visitors of Explorama lodges (CONAPAC website). According to Peter Jenson (pers. comm. 2005), founder and general manager of Explorama Tours, due to a number of reasons CONAPAC has not renewed their 100,000 hectare concession with the Peruvian Government, effectively dissolving the CONAPAC Reserve. Within the former CONAPAC Reserve (and within walking distance from ExplorNapo Lodge) are the ACTS Field Station (formerly known as the ACEER Field Station) (Figure 1-2) and one of the largest Canopy Walkway systems in the world (Castner 2000). Today, Explorama Tours owns and operates a series of reserves

consisting of 1,942 hectares that surround the ExplorNapo Lodge, the ACTS Field Station, and the Canopy Walkway (Jensen pers. comm. 2005).

The Sucusari community is located in an area dominated by "terra firme" or upland tropical wet forest yet seasonally inundated floodplain forest is also present (Gilmore pers. obs.). The terrain ranges from flat to hilly and the soil consists of unconsolidated sediments of different ages and origins, including the mid-Miocene Pebas formation and fluvial deposits that are of a more recent origin (Tuomisto et al. 2003). The vegetation and flora of the Sucusari River region have been relatively well studied compared to other surrounding areas in the Peruvian Amazon (Pitman et al. 2004). For example, Vásquez-Martínez (1997) describes the flora of the Sucusari River region, and a couple of other areas, in his book entitled "Flórula de las Reservas Biológicas de Iquitos, Perú".

Based on field observations, the Sucusari River can best be classified as a "mixed water" river (Gilmore pers. obs.).[2] A practical way to classify rivers while in the field is based on water color (Kalliola and Puhakka 1993) and "mixed water" rivers are rivers that are intermediate in color between "white water" rivers and "black water" rivers (Kalliola and Puhakka 1993; Puhakka et al. 1992). "White water" rivers (i.e. the Amazon and Napo rivers) have their origins in the Andes whereas "black water" and "mixed water" rivers have their origins in lowland forest (Kalliola and Puhakka 1993). It is also important to note that the level of the Sucusari River changes dramatically throughout the year. The high water season for the Sucusari River reaches its peak from approximately May to July and during this time period the flood plain forest along the river is seasonally inundated. Overall, the level of the river varies more than 5 meters between its highest and lowest water level.

The Maijuna and other members of the Sucusari community employ a variety of subsistence strategies, including hunting, fishing, swidden-fallow agriculture, and the gathering of various forest products. Families and individuals rely on a number of income generating strategies, including the sale of game meat, agricultural produce, domestic animals (i.e. pigs, chickens, and ducks), fish, timber, and non-timber forest products (e.g. the leaves of *Lepidocaryum tenue* Mart., the fruits of *Mauritia flexuosa* L., etc.), among other things. Some individuals within the Sucusari community presently enter into agreements with mestizo *patrones* to facilitate hunting and logging as a means to generate income. The system of debt and under-compensation practiced by these *patrones* ultimately results in the exploitation of community members. Individuals also occasionally participate in wage labor inside (i.e. logging) and outside of the community. The sale of a variety of tourist crafts to visitors from ExplorNapo Lodge also used to be somewhat common at the onset of this study yet presently no families or individuals within the community are currently making or selling tourist crafts due to the fact that tourists very rarely, if ever, visit the community.

The community as a whole also generates income from a variety of sources. For example, the community charges individuals from other communities a flat fee for hunting upriver from the main community (hunters were charged approximately $6 per 15 days of hunting in July 2004). In addition, the community also charges loggers a fee for logging within the watershed of the Sucusari River. Presently, several groups of loggers, from both outside and inside the community, are selectively logging several tree species within the Sucusari watershed. The most common species currently being selectively logged are *Cedrela odorata* L., *Virola* spp., and *Ceiba pentandra* L.. The community charges these groups of loggers for each section of trunk (sections are approximate 3 meters in length) floated past the main community and each

species has a specific price. For example, loggers are charged approximately $6 per section of *C. odorata* and *C. pentandra*, and approximately $1.50 per section of *Virola* spp. (differences in prices between these species reflect differences in the market value of each species in Iquitos, Peru; figures are from July 2004). The community money generated from these different methods is used in a variety of ways, including buying communally owned livestock (i.e. cows), buying and maintaining a communally owned boat motor, travel for community elected political officials, treating health emergencies, and to have communal parties and *mingas* (communal work parties). In addition, the money is also sometimes split up among community members and households.

Politically the Sucusari community is currently organized and governed via a system imposed by the Peruvian Government (Bellier 1993a, 1994). This system differs markedly from the traditional Maijuna power structure previously described. There are several political positions within the Sucusari community with the most important being the "presidente de la comunidad" ("president of the community") or "jefe de la comunidad" ("leader of the community") and the "teniente-gobernador" (Bellier 1993a, 1994; Gilmore pers. obs.). The "presidente de la comunidad" presides over the community while the "teniente-gobernador" is entrusted with executive powers (Bellier 1993a, 1994). Both positions are elected via consensus by the adult male members of the community. To date no female has ever held either one of these positions yet non-Maijuna male residents of the community have held both of these offices. In addition to these two positions there are also other positions within the political structure of the community. One such position is the "presidente de la APAFA (Asociación de Padres de Familia)" or "president of the APAFA (Association of Parents of the Family)" (Bellier 1993a, 1994; Gilmore pers. obs.). The "presidente de la APAFA" is in charge of maintaining,

improving, and looking after the community school and the teacher's house (Bellier 1993a, 1994).

Sucusari has one primary school with a bilingual teacher yet unfortunately no instruction takes place in Maijuna and very few lessons are taught about the Maijuna language. Presently, the community school does not have any copies of the Maijuna primers produced by Daniel Velie, however obtaining copies of the primers is a current goal of FECONAMAI. Unfortunately, all of the Peruvian textbooks that are used within the school are in Spanish and, as Bellier (1994) states, these books do not have any information specifically about the Maijuna culture and they ultimately teach concepts that are completely foreign to them. Regrettably, the current educational situation within Sucusari is further eroding language competency among Maijuna children and ultimately leading to a decline in their overall understanding of Maijuna traditions and cultural institutions.

Notes

[1] This population estimate does not include those Maijuna living in mestizo communities, other indigenous communities, or in Iquitos (Bellier 1994).

[2] I should also note that Vásquez-Martínez (1997) classifies the Sucusari as either a “black water” river or a “mixed water” river in parts yet it is difficult to determine exactly what type of river he considers the Sucusari River. For example, when defining the term igapó he states, “Forest located in the shores of “black” and/or “mixed” water rivers like the Nanay River and partly the Sucusari Stream” (Vásquez-Martínez 1997: 4).

Figure 1-1. Map showing the location of all four current Maijuna communities (Sucusari, Puerto Huamán, Nueva Vida, and San Pablo de Totoya), including the surrounding region.

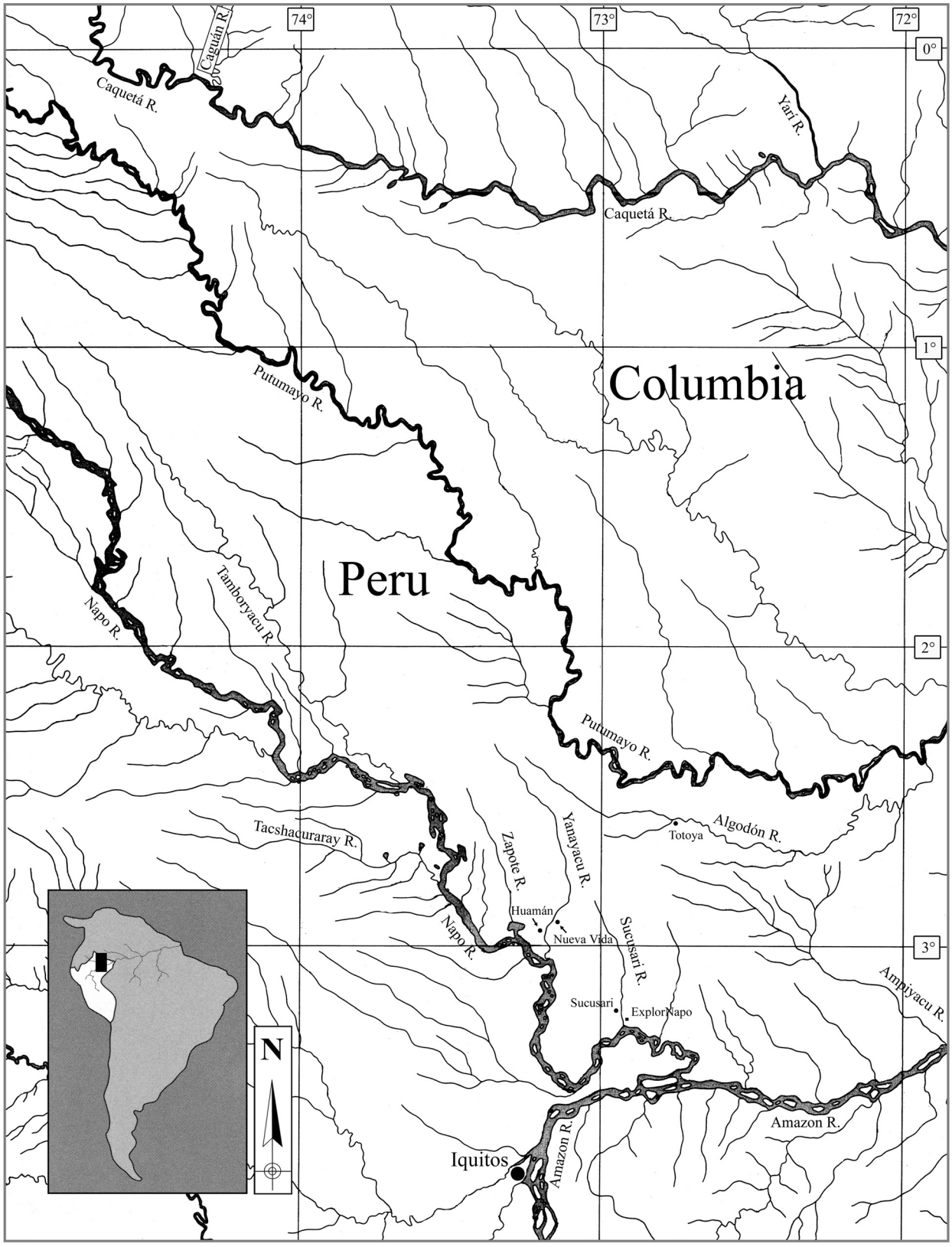
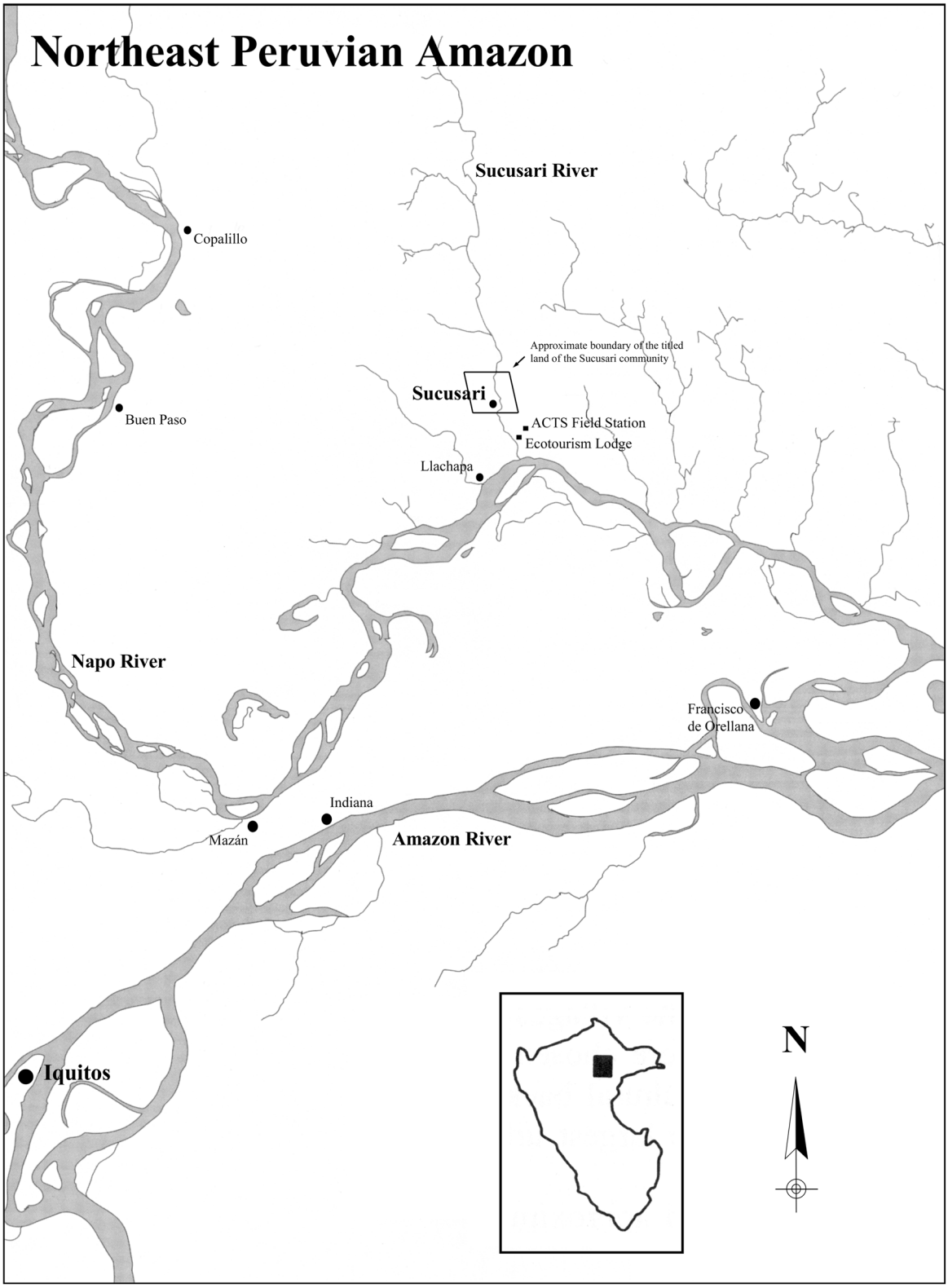


Figure 1-2. Map of the northeast Peruvian Amazon showing the location of Sucusari, the Maijuna community where all research was conducted. Map produced by International Expeditions and modified and used by the author with their permission.



Chapter 2: The classification, significance, and use of rain forest habitat types recognized by the Maijuna Indians of the Peruvian Amazon

Introduction

The Amazon basin is widely recognized and celebrated for its biological diversity. With the highest tree species diversity per hectare in the world (Valencia et al. 1994) and at least 30,000 plant species present (Gentry 1982), the Amazon basin is one of, if not the most, botanically rich regions of the world. Unfortunately, the forests of Amazonia remain relatively understudied from a compositional standpoint (Nelson et al. 1990; Shepard et al. 2001; Terborgh and Andresen 1998; Tuomisto 1998). In addition to a lack of knowledge regarding species composition, species distributions and habitat diversity within the Amazon basin are also poorly understood (Condit 1996; Fleck and Harder 2000; Shepard et al. 2001, 2004; Terborgh and Andresen 1998; Tuomisto 1998; Tuomisto et al. 1994).

The exact number of habitat types found within Amazonia remains unknown. In an attempt to elucidate the habitat types present within this area several authors and agencies have developed different classification systems. For example, the UNESCO (1980) vegetation map of South America details only six cover types in Amazonia (cited in Terborgh and Andresen 1998: 646). For the Brazilian Amazon, both Pires (1973) and Prance (1978) describe eight main vegetation types, with various subtypes, based mainly on flooding regime, geomorphology, type of water, and physiognomy. Using essentially the same criteria, Pires and Prance (1985) propose a total of 20 forest and non-forest habitat types for the Brazilian Amazon. For the Peruvian Amazon, Encarnación (1985, 1993) describes 16 and 18 vegetation associations, respectively, based on geomorphology, vegetation, soil texture, water quality, and river dynamics. Malleux (1975, 1982) also proposes several major vegetation types for the Peruvian Amazon based on

topography, canopy texture, and forest vigor. Tuomisto et al. (1995) present one of the highest estimates of habitat diversity published for the Peruvian Amazon to date. Using satellite images, Tuomisto et al. (1995) propose that the Peruvian Amazon may contain more than 100 distinct habitat types.

The classification systems described above vary widely in their estimates of habitat diversity within Amazonia. Although these differences may be partly due to variations in study objectives, methods, levels of detail desired and/or are an artifact of collecting and research, these disparities generally underscore our incomplete understanding of this subject matter. As Terborgh and Andresen (1998: 646) state about this same subject, "The fact that such widely discrepant views can stand side by side reflects a vacuum of knowledge of floristic patterns within tropical South America, and within Amazonia in particular." In short, there exists no complete habitat classification system that can be effectively and consistently used throughout the Amazon basin (Parodi and Freitas 1990).

Ethnoecology, defined by Posey (1983) as the study of indigenous perceptions of "natural" divisions in the biological world and plant/animal/human relationships within each division, can lead to a better understanding of the ecological heterogeneity and diversity of tropical rain forests (Frechione et al. 1989). One important avenue of research within the field of ethnoecology is the study of indigenous habitat classification systems. Indigenous habitat classification systems represent an important repository of ecological knowledge for scientists, conservationists, and planners alike in regions like Amazonia where fine scale information and understanding of habitat diversity is often limited (Fleck and Harder 2000; Parker et al. 1983; Posey 1983; Posey et al. 1984; Shepard et al. 2001). Indigenous peoples have highly detailed knowledge of the habitat types within and around their communal lands (Shepard et al. 2004)

and studying the habitat classification systems employed by these groups can better elucidate Amazonian habitat diversity (Fleck and Harder 2000; Parker et al. 1983; Posey 1983; Posey et al. 1984; Shepard et al. 2001). Unfortunately, the study of indigenous classification of habitat types has received relatively little attention compared to other areas of study in ethnoecology and ethnobiology (Shepard et al. 2001; Sillitoe 1998). Most descriptions of habitat types recognized by indigenous groups are brief, preliminary, or incomplete while more comprehensive and detailed studies are rare. Several studies (e.g., Balée 1994; Carneiro 1978, 1983; Parker et al. 1983; Posey 1983) have documented, to varying degrees, the habitat types recognized by different Amazonian indigenous groups yet, by far, the most comprehensive studies to date have been published by Fleck and Harder (2000) and Shepard et al. (2001).

To better understand how indigenous peoples perceive and classify the habitat types found within and around their communal lands the classification of forest and non-forest habitat types was studied in a Maijuna Indian community. An ethnoecological framework was utilized to investigate how the Maijuna perceive their natural world, and the resources found there, and to understand how they act on these perceptions. The specific objectives of this study were to: (1) document the habitat classification system of the Maijuna; (2) understand how they use the culturally-based habitat types, and their associated resources, seasonally and temporally; and (3) document the ecological knowledge and management strategies associated with each habitat type. The Maijuna had never been the subject of an intensive ethnoecological study in the past yet Bellier (1993b, 1994), in her two ethnographies of the Maijuna, briefly mentions the existence of approximately 10 forest and non-forest habitats identified and named by the Maijuna. It is the goal of this investigation to provide a more comprehensive description and

explanation of the ecological knowledge and perceptions of the Maijuna in regards to their habitat classification system.

The Maijuna

The Maijuna (Mai huna) are a Western Tucanoan people presently found in the northeastern Peruvian Amazon (Bellier 1993a, 1994; Steward 1946). Like other indigenous groups, the Maijuna are known by a variety of different names within the literature, including Orejón or Coto (Koto) in the more recent literature and Payagua in the early literature. As Bellier (1993a, 1994) methodically details, the Orejón, Coto, and ultimately the Maijuna are descendants of the Payagua. During the 16th century the Western Tucanoans were found in the area between the Napo and Putumayo rivers (in present day Peru) and extended into the regions of the Caguán and Caquetá rivers to the north and the Yarí River to the east (in present day Columbia) (Figure 2-1). Bellier (1993a, 1994) hypothesizes a northwestern origin for the Payagua and suggests that they arrived in the general area of the lower Napo toward the end of the 17th century. During the 18th century the Payagua were very geographically mobile and toward the end of the 18th century a part of the Payagua were living in the area between the Napo and Putumayo rivers from the Tamboryacu River to the Ampiyacu River (Figure 2-1), an area that is recognized as traditional by the present day Maijuna (all four present day Maijuna communities are located within this area) (Bellier 1993a, 1994). According to Bellier (1993a, 1994), the ties between the Maijuna and these southern Payagua can be directly traced. Around the beginning of the 19th century, the northern Payagua are no longer mentioned in the literature and, according to Bellier (1993a, 1994), they were divided or absorbed by the Tama, Macaguaje, or the Siona. Throughout their history the Maijuna, like other Amazonian indigenous groups,

have been influenced and transformed by pressure from a variety of sources, including missionaries, the *patrón* system, government policies, the regional society, and the formal education system, among others.

In total there are approximately 300 Maijuna individuals presently living along the Sucusari, Yanayacu, and Algodón rivers of the northeastern Peruvian Amazon (Bellier 1993a, 1994).[1] Four Maijuna communities are located along the above-mentioned rivers including, Puerto Huamán and Nueva Vida along the Yanayacu River, Sucusari along the Sucusari River, and San Pablo de Totoya along the Algodón River (Figure 2-1). All four communities are recognized as official Native Communities by the Peruvian Government and all have parcels of legally titled land (Brack-Egg 1998). Today, inhabitants of the three rivers have very little formal and informal contact with each other; they are economically and politically independent from one another and they are not linked by formal and recurrent exchange (Bellier 1993a, 1994; Gilmore pers. obs.).

Study Site

Field research was conducted in Sucusari, a Maijuna community located along the Sucusari River, a tributary of the Napo River, in northeastern Peru (Figure 2-2). Sucusari is located approximately 126 kilometers by river from Iquitos, the largest city in the Peruvian Amazon. The community is composed of 20 mono-familial or pluri-familial houses with 97 residents in total, the majority of whom are indigenous Maijuna (71% pure Maijuna and 12% at least one half Maijuna; July 2001). Approximately two thirds of the population lives within or very close to the main community, located approximately 6 kilometers by river from the confluence of the Sucusari and Napo rivers, whereas the rest of the population lives spread out

upriver for several kilometers. In total, the Maijuna of Sucusari have legal title to 4,771 hectares of land, a small percentage of their traditional territory (Brack-Egg 1998).

Sucusari is located in an area dominated by upland tropical wet forest yet seasonally inundated floodplain forest also exists (Gilmore pers. obs.). The terrain ranges from flat to hilly and the soil consists of unconsolidated sediments of different ages and origins (i.e. the mid-Miocene Pebas formation and fluvial deposits) (Tuomisto et al. 2003). Based on field observations, the Sucusari River can best be classified as a "mixed water" river (Gilmore pers. obs.).[2] The level of the river changes dramatically throughout the year, varying more than 5 meters between its highest and lowest water levels. The high water season for the Sucusari River reaches its peak from approximately May to July, resulting in the seasonal inundation of flood plain forest along the river. Overall, this general region of Peru has a mean annual temperature of 26º C and a mean annual precipitation of almost 3100 mm per year (Marengo 1998).

A variety of subsistence strategies, including hunting, fishing, swidden-fallow agriculture, and the gathering of various forest products, are employed by the Maijuna and other members of the Sucusari community. Hunting and fishing are primarily the job of Maijuna men yet women also occasionally participate in these activities. Both men and women are involved in the production and maintenance of swiddens yet their participation and the activities that they perform are sometimes specialized (Bellier 1993b, 1994; Gilmore pers. obs.). Families and individuals in Sucusari generate income from a variety of sources, including the sale of game meat, agricultural produce, domestic animals, fish, timber, and non-timber forest products, among other things. Maijuna individuals also occasionally participate in wage labor inside (i.e. logging) and outside of the community. The sale of a variety of tourist crafts to visitors from an ecotourism lodge located approximately 4 to 4.5 kilometers downriver from the Sucusari

community also used to be somewhat common at the onset of this study yet tourists very rarely visit the community currently.

Methods

Preliminary research for this study was completed over three field seasons totaling approximately eight months from 1999-2001. During this time period the existence of the Maijuna habitat classification system was confirmed and a preliminary list of Maijuna recognized habitat types was compiled utilizing open-ended interviewing techniques and participant observation (Cotton 1996). Community consent was obtained during this time period and data collection for other parts of this study was also initiated.

An in-depth analysis of the above mentioned research objectives was carried out over three field seasons totaling approximately nine months from 2003-2004. To more fully understand the Maijuna habitat classification system, seven Maijuna males and two Maijuna females (approximately 38 to 78 years old) were extensively interviewed several times using semi-structured interviewing techniques (Cotton 1996). Consultants were chosen for participation in this portion of the study due to their extensive knowledge of the subject matter and their willingness to participate. During the above mentioned interviews, each consultant was individually interviewed regarding the habitat types that they recognize (Fleck and Harder 2000). Each consultant was asked to list as many habitat types as he or she could and to describe or explain how they recognize each of these different habitats. After each consultant was finished describing or discussing the habitat types that he or she free listed they were then asked about the habitats mentioned by other consultants (Fleck and Harder 2000). Consultants were also questioned about the existence of habitat types contained in the preliminary list of Maijuna

recognized habitats previously compiled during the open-ended informal interviews. Asking consultants about the habitat types mentioned by other individuals allowed the names, characteristics, etc. of the different habitats to be cross-checked and allowed me to determine which habitat types are recognized by a majority of consultants (Fleck and Harder 2000).

To further understand how the Maijuna recognize and name the habitat types identified during the above mentioned interviews, Maijuna consultants were also accompanied on hunting, fishing, collecting, and farming trips. While passing through the different habitat types on these trips each consultant was asked to identify and name the habitat type being passed through and to explain how they recognize and categorize these areas (Fleck and Harder 2000; Sillitoe 1998). To further understand the ecological basis of the Maijuna habitat classification system, as many examples as possible of each of the different habitat types recognized by a majority of consultants were also visited and qualitative ecological information about each habitat was collected. In addition, indicator species used by the Maijuna to classify and recognize each of the different habitat types were collected. Voucher specimens were collected with the help of Maijuna consultants and are deposited in the Herbarium Amazonense (AMAZ), Universidad Nacional de la Amazonia Peruana, Iquitos, Peru and/or the Willard Sherman Turrell Herbarium (MU), Miami University, Oxford, Ohio.

To further elucidate the ethnobiological and ethnoecological knowledge, use practices, and management strategies associated with each of the different culturally-based habitat types, and their associated resources, all relevant data that were collected via participant observation and open-ended interviews were verified and supplemented by conducting semi-structured group interviews. Two groups of consultants, composed of individuals previously interviewed about the Maijuna habitat classification system, were interviewed during this phase of the study; one

group consisted of two males and the other group consisted of two males and one female, respectively. Data collection during this phase of the study focused on those plant or animal species for which the habitat types are named, because they are culturally-significant indicator species and they are generally dominant within the habitat type.

All interviews during the course of this study were conducted in Spanish and, when necessary, translated into Maijuna by a bilingual Maijuna consultant. Transcription of Maijuna terms was accomplished with the help of this same Maijuna consultant utilizing a practical orthography previously established by Velie (1981).[3] Throughout this paper, all Maijuna terms and names in the text and tables are bolded and written using this orthography unless otherwise stated.[4] The Maijuna language is an agglutinative language (Bellier 1994), that is, words are formed primarily through agglutination, "the formation of words from morphemes that retain their original forms and meanings with little change during the combination process" (Morris 1981). In addition, all data collected during the course of this study were coded, organized, and analyzed using a modified version of the methods described by Strauss and Corbin (1998).

Results and Discussion

The Maijuna of Sucusari have an extensive and complex habitat classification system. Their habitat classification system is not a perfectly hierarchical system; instead it is composed of multiple, separate overlapping sub-systems which they use to classify both forest and non-forest habitats. They classify habitats based on geomorphology, indicator plant species, physiognomy, disturbance, and indicator animal species. What follows is a description and explanation of the habitat types that the Maijuna of Sucusari classify within their titled and traditional lands, an area covering tens of thousands of hectares of Amazonian rain forest. At a

minimum, the Maijuna name and its translation, the local (non-Maijuna) name, and a description of each habitat will be provided. Descriptions of habitats are based on both consultant testimony and qualitative ecological observations made while visiting the different habitats. Only those habitats recognized by a majority of the consultants interviewed are presented in this paper. Also, in the event that more than one Maijuna name was identified for the same habitat, only the first two most common or popular names are being reported here and therefore minor or infrequently used names have not been included. It is also important to note that local names were not recorded for all of the Maijuna recognized and named habitat types. This may mean one of two things; the Maijuna named habitat type may not be classified and named by other local people in the area or the consultants interviewed may simply not know the local name. In addition, the Maijuna soil classification system will be presented and the different aquatic habitats, and their respective parts, recognized by the Maijuna of Sucusari will also be discussed.

Traditionally, the Maijuna do not have an extensive myth or legend about the origin of the forest, instead they simply state that their cultural hero **Maineno** created it (Bellier 1993b). The Maijuna word for forest in general is **maca**. **Maca** also refers to any area in the forest that is not further classified by the Maijuna as a more specific habitat type based on indicator plant species, physiognomy, disturbance, and/or indicator animal species. **Maca** is outside of the domain of extensive and prolonged human control and therefore Maijuna swiddens (**yio**) and other human converted and dominated areas are not considered **maca** (Bellier 1993b, 1994; Gilmore pers. obs.). The dichotomy between **maca** and **yio** seems especially significant. For example, when asked how he recognizes or knows that he is in **maca** one Maijuna consultant stated, "When you do not see an **yio**. In **maca** you do not encounter **yio**." In short, the Maijuna term **maca** essentially corresponds to the Western ecological notion of primary forest. It is also

important to note that Bellier (1993b, 1994) states that the Maijuna word for forest in general is either **maka**[5] (**maca**) or **airo**[5], with **maka** being well known or familiar forest and **airo** being deep forest that is poorly known. All Maijuna consultants from the Sucusari community interviewed for this study did not recognize this dichotomy and therefore only the term **maca** will be used in this paper to designate forest in general.

Undifferentiated forest, that is forest that is not further classified by the Maijuna as a more specific habitat, dominates the Maijuna landscape. Based on field observations and consultant testimony it is evident that the majority of forest within the current and traditional lands of the Sucusari community is simply named and classified as **maca**. As one Maijuna male consultant stated:

> "There is more simple forest (**maca-** undifferentiated forest) than the other types of forest, **ne cuadu** (*Mauritia flexuosa*[6] palm swamp), **osa cuadu** (*Oenocarpus bataua* palm swamp), or the others. There are times you pass a **ne cuadu** but the rest is simple forest, there are times you encounter a **mɨi nui nɨcadadi** (forest dominated by the understory palm *Phytelephas macrocarpa*) and after it is simple forest. You do not encounter, for example, a **ne cuadu** each time you walk in the forest. For example, you can walk for an one hour or two hours without encountering a **tuada** (an animal mineral lick), there is more simple forest."

It is not surprising that undifferentiated forest (**maca**) is more common than other Maijuna named and classified habitats. Most Maijuna recognized habitats are classified and named based on dominant indictor plant species and therefore their existence should be the exception and not the rule considering the fact that the forests of Amazonia are characterized by very high plant species diversity and generally low frequency of individual species.

Geomorphologically defined habitats:

The Maijuna of Sucusari identify and classify multiple geomorphologically defined habitat types based mainly on topography and hydrology (Table 2-1). These habitats can

describe any terrestrial area encountered by the Maijuna and all other habitats classified by indicator plant species, physiognomy, disturbance, and indicator animal species overlay these geomorphologically defined habitats. Two main categories can be identified among the geomorphologically defined habitats recognized by the Maijuna, upland forest (**ɨmɨ tɨ̱tɨ** or **ɨmɨ coti**) and floodplain forest (**yiaya coti**). The main difference that exists between these two general categories is that floodplain forest is located along rivers, and is therefore seasonally inundated, whereas upland forest is not (Figure 2-3). The division between these two main categories of geomorphologically defined areas is represented in Table 2-1. Interestingly, the dichotomy between upland and floodplain forest is also fundamental to current Western scientific classification systems (Shepard et al. 2001).

As previously stated, the titled and traditional lands of the Sucusari community are, by far, dominated by upland forest yet seasonally inundated floodplain forest is also present. The vast majority of swiddens within the Sucusari community are cleared and planted in upland forest although some fields in floodplain forest also exist. Generally speaking, the Maijuna also collect and hunt in both upland and floodplain forest. However, there are habitats in both upland and floodplain forest that the Maijuna specifically target (or avoid) when it comes to collecting, hunting, and even farming for that matter. For example, the different habitats defined by indicator plant species, physiognomy, disturbance, and indicator animal species that are found throughout upland and floodplain forest are not of equal importance when it comes to resource availability, use, and significance, and some of these differences will be addressed in the coming pages.

The Maijuna recognize a variety of more specific habitats within the general categories of both upland and floodplain forest (Table 2-1). For example, in upland forest the Maijuna

recognize both hills (**ɨmɨ tɨ̱tɨ** or **ɨmɨ coti**) and slopes of hills (**ɨmɨ tɨ̱tɨ dajebɨ** or **ɨmɨ coti dajebɨ**). Drainage channels in upland forest (**ɨmɨ tɨ̱tɨ daje yodo** or **ɨmɨ coti daje yodo**) that collect rain water from surrounding hills are also classified and named. These are essentially the ephemeral headwaters of streams found throughout the Sucusari region. In addition, the Maijuna also recognize swamps that are found in poorly drained upland forest. These areas are called **cuadubɨ** and are generally small in size (Figure 2-3). The swampy nature of these areas makes them unsuitable for agriculture. The Maijuna classify and name a variety of other types of swamps based on indicator plant species (see Table 2-3) and these will be addressed with the other habitats defined by vegetation. **Cuadubɨ** are considered a different class of swamp because they are not dominated and/or named after a particular plant species and are therefore only characterized by the fact that they have poor drainage. It is important to note that **cuadubɨ** are also found in floodplain forest (Table 2-1).

Floodplain forest is different than upland forest in that it has different names depending on the season and presence and/or absence of water. For example, floodplain forest (**yiaya coti**) is called **cuedaca** when it is seasonally inundated at normal levels (Figure 2-3). Along the Sucusari River this generally occurs during the months of May, June, and July. The seasonal inundation of floodplain forest over a several month period obviously completely changes how the Maijuna interact with these areas. For example, the Maijuna fish in **cuedaca** (flooded forest) yet they cannot fish in these same areas during other times of the year. In addition, the presence of **cuedaca** spells the end to agricultural activities in floodplain forest because these areas become completely covered with water. During times of abnormally high flood waters floodplain forest is called **jai cuedaca** instead of **cuedaca**. **Jai** literally translates as 'large' and the Maijuna classify inundated forest as **jai cuedaca** when floodwaters cover the tops of

normally dry levee islands. Therefore **cuedaca** does not cover levee islands whereas **jai cuedaca** does. Likewise, floodplain forest (**yiaya coti**) is also called a different name when it is temporarily flooded for short periods of time (up to several days) due to heavy rains. During these times it is called **oco cuedaca** or **oco minijo daca** and, according to consultants, this only occurs along small streams and medium sized rivers and not large rivers like the Amazon and Napo rivers.

Within floodplain forest the Maijuna distinguish several specific habitats, including levee islands (**yiaya coti tɨtɨ** or **cuedaca tɨtɨ**). **Tɨtɨ** literally translates as 'hill' and therefore levee islands are hills found within **yiaya coti** or **cuedaca** (Figure 2-3). At times of **cuedaca**, the floodplain forest is seasonally inundated for several months and levee islands are completely surrounded by water. During these time periods, several species of game animals may become trapped on levee islands and therefore Maijuna hunters target these areas at these times. One Maijuna male consultant explained:

> "On the levee islands when it is the time of **cuedaca** there are all types of animals that lodge there… For example, there are paca (*Agouti paca*; **seme**, **oje beco**, **pɨbɨ aco**), there are also black agouti (*Dasyprocta fuliginosa*; **maitaco**, **moñeteaco**, **codome**), there are also forest rats (species unknown; **ñacochi**), there are also the green acouchys (*Myoprocta pratti*; **maso**), sometimes also armadillos (*Dasypus* sp.; **toto aquɨ**). All of these animals are there, or enter, or lodge on these levee islands. And also sometimes there are (a species of) tinamou (*Tinamus* sp.; **yoto**), and **biyo** (*Crypturellus* sp.), what they (also) call **aiyoto**, and the (other species of) tinamou (*Crypturellus* sp.; **bɨ**), these birds also lodge there in this flooded forest or this levee island. Now to kill these animals you go in the day among three people or…if you have a wife you can go to search with your wife. Then you can go for a walk (around) the whole levee island and there you sometimes encounter the armadillo in a hole, sometimes the paca, and also you can encounter black agoutis, when they do not hide you can kill them. All of these animals die when it is the time of **cuedaca**, yes they die, yes. And also there are some black agoutis that sometimes also swim, no, they escape. …If you cannot hunt in the day on the levee islands sometimes you go in the night with your flashlight, your shotgun, and your shotgun shell, no, and your flashlight. And we are ready to search now. There these animals are, they are sometimes rooting, looking for their food, there they are to shoot. That is what the levee islands are."

All of the above mentioned animal species were confirmed as being hunted on levee islands during times of **cuedaca** by other Maijuna consultants interviewed as a group. Furthermore, according to several consultants, an unidentified turtle species that the Maijuna call **meniyo** is also found on and hunted on levee islands.

In addition to levee islands, the Maijuna also identify other areas within floodplain forest. For example, the Maijuna recognize and name a habitat that encompasses both the edge of a river or stream and its respective bank which they call **yiaya unu**. The Maijuna frequently scan these areas, and their associated vegetation, from their canoes for animals to hunt during both the day and night. According to consultants, common animals encountered and hunted in this habitat include, paca (*A. paca*), black agouti (*D. fuliginosa*), armadillos (*Dasypus* sp.), **ñacochi** (an unknown species of forest rat), various species of monkeys, among other nocturnal and diurnal animals. The Maijuna also commonly fish in this habitat using a variety of different techniques. For example, they spear fish along river banks at night with the help of flashlights during times of lower water levels (therefore not during **cuedaca**) and when there is little moonlight. In addition, the Maijuna also collect a variety of useful plant species from this habitat, including *Inga* spp. (edible fruits), *Cecropia* sp. (mucilage from inner bark is used), among others. It is important to note that Bellier (1993b, 1994) seems to consider both **yiaga guni**[5] (**yiaya unu)** and **yiaya koti**[5] (**yiaya coti)** the same thing yet according to the consultants interviewed for this study they are in fact separate entities and habitats. In addition to **yiaya coti**, the Maijuna also recognize and name a habitat which they call **chitada unu**. **Chitada** is the Maijuna word for lake and therefore **chitada unu** is the edge and bank of a lake.

In summary, the Maijuna have a detailed geomorphologically defined classification system that they can use to describe and classify any terrestrial area encountered. As previously

stated, all other Maijuna recognized habitats classified by indicator plant species, physiognomy, disturbance, and indicator animal species overlay these geomorphologically defined habitats. It is important to note however that some of these habitats are restricted to certain geomorphologically defined habitats while others are not. Therefore, as Fleck and Harder (2000) note in regards to the Matses habitat classification system, there is not a one-to-one correspondence between vegetatively defined habitats and geomorphologically defined habitats recognized by the Maijuna.

Habitats defined by physiognomy:

The Maijuna identify two different habitats defined by physiognomy or outer appearance within their titled and traditional lands (Table 2-2). The first is what they refer to as **aquibɨ** ('place with ugly forest'). This habitat is found in floodplain forest along river margins and they are characterized by low growing, very dense vegetation that is dominated by vines and thorny plants. These areas are essentially impenetrable thickets where vision and mobility are extremely limited. As one Maijuna male consultant explained about **aquibɨ**, "You cannot walk, there are thorns and there are vines, you cannot walk… You need to cut it (with your machete) to pass by." Another Maijuna male consultant simply stated, "Where there is an **aquibɨ** you cannot walk, it is better to go back (where you came from)." Due to the fact that vision and mobility are severely limited in these areas the Maijuna generally do not enter **aquibɨ** to hunt, collect, or clear agricultural fields, therefore these areas are usually avoided. In regards to hunting, one Maijuna male consultant stated:

> "A good hunter cannot kill an animal in this **aquibɨ**. Because the animal enters inside **aquibɨ**, you cannot enter like the animals. The animals leave them (the hunters)… They move faster and they leave them. It is not a place to hunt, you cannot hunt easily there in that **aquibɨ**. Sure the animals move (around) but a person cannot follow their trail

> because it is an **aquibi**… Like we were teaching you, there are thorns, there are thorns that can hurt your body. But for animals there are not thorns, there is nothing, they go and nothing more…"

This same general observation was expressed by several other consultants. In addition, the Maijuna also classify and name several other types of habitats located in areas with "ugly forest" based on dominant plant species or plant life forms (see Table 2-5).

The second habitat that the Maijuna differentiate based on physiognomy is what they call **deo bese** ('good clarity') or **deo dadi** ('good place'). This habitat is also sometimes called **maca deo bese** ('forest with good clarity') to stress that the speaker is talking about the forest. These terms generally refer to forests with an open understory. These forests may be located in both upland and floodplain forest. Vision and mobility are not limited in these areas and therefore they are not avoided. When asked to describe this habitat a Maijuna female consultant stated, "Where there are not thorns, it is open… There are trees up above but nothing down below…" In addition, a Maijuna male consultant explained when describing this forest type, "…**Deo bese** is an open place, you can see an animal in **deo bese**, (it is) easier to see an animal."

Habitats defined by indicator plant species:

The Maijuna of Sucusari identify a variety of habitats defined by indicator plant species or plant life forms. Three main categories can be identified within this general group, including habitats located in areas with 'soft earth' (swamp habitats), habitats located in areas with 'ugly forest', and habitats located in areas that do not have 'soft earth' or 'ugly forest'. The division between these three general categories is represented in Tables 2-3, 2-4, and 2-5.

Ethnobotanical data collected for each of the indicator plant species used by the Maijuna to identify and name these different habitat types are presented in Table 2-11. The Maijuna,

local, and scientific names for each of these plant species are provided, along with an explanation of how they are used. In addition, a description of the harvesting method and approximate time of harvest (presented in months) is also reported for each respective plant use. Considering the fact that the vast majority of habitats are identified based on dominant plant species, this information allows for a good understanding of how and when the Maijuna are interacting with the different habitats when it comes to the collection of botanical resources. In addition to collecting plants in these different habitats, the Maijuna also generally hunt and farm in these areas. As previously stated, all habitats are not of equal importance when it comes to resource availability and use, and therefore significant and important information regarding hunting and farming in these areas will be highlighted.

The Maijuna recognize and name 14 different habitats defined by indicator plant species or plant life forms that are located in swampy areas (Table 2-3). All of the Maijuna names for these habitats are formed by joining the name of the indicator plant species or plant life form with the Maijuna word **cuadu** which literally means 'soft earth'. For example, the Maijuna name for a *Mauritia flexuosa* palm swamp is **ne cuadu** which can be literally translated as '*Mauritia flexuosa* in soft earth'. The habitats described in Table 2-3 vary in size, frequency, and importance yet all of them are not suitable for agriculture due to their swampy nature. As a Maijuna male consultant explained when asked about farming in a **ne cuadu** (*M. flexuosa* palm swamp):

> "…It is not an appropriate soil, no. It has its soft earth and also there are some that have water… And nothing can be planted, that is it. For that reason we do not want to make (fields) in an *aguajal* (local name for a **ne cuadu**). Because the water kills the plants, that is it. Because the water kills the plants and the plants die and they do not grow… But we have sense and we see it is not possible to make a field (there) and (therefore) you must look in the forest (that is, forest other than swamp forest), no, to make a field."

This same general idea was expressed by a variety of other consultants regarding farming in any of the habitats listed in Table 2-3.

Mauritia flexuosa palm swamps (**ne cuadu**) are the largest and perhaps most culturally important habitat defined by indicator plant species located in areas with 'soft earth' (Table 2-3) (Figure 2-4). These areas are dominated by the palm tree *M. flexuosa* (**ne ñi**) and are found in both floodplain and poorly drained upland forest. Notably, this habitat has been well reported and described in the scientific literature (e.g., Encarnación 1985, 1993; Kahn 1988, 1991; Kahn and Mejia 1990). *Mauritia flexuosa* is used for a variety of major and minor ethnobotanical uses (Table 2-11) yet the most important plant product obtained from this tree are its fruits. The fruits are eaten, made into a beverage, and processed into an oil. The fruits are also sometimes sold, due to their value in the regional economy (Mejia 1992; Padoch 1988; Vasquez and Gentry 1989), and pieces of fruits are used as fishing bait. Within Sucusari, *M. flexuosa* fruits from approximately May to August and during this time **ne cuadu** become important fruit collecting areas. In addition to collecting plant products from this habitat, the Maijuna also harvest two species of beetle larvae (**ne baquɨ** and **sañi**), that are eaten and used as fishing bait, year round from **ne cuadu**. These beetle larvae become established in the trunks of *M. flexuosa* trees that are felled to collect fruits and they are also sometimes found in naturally fallen tree trunks. In addition, the Maijuna also specifically fell both male and female *M. flexuosa* trees solely to provide fodder for and encourage beetle larva growth. The Maijuna also eat the adults (**bɨdico** and **sañi bɨaco**) of these two beetle species when encountered.

A variety of game animals also eat *M. flexuosa* fruits and, as a result, **ne cuadu** become important hunting areas when *M. flexuosa* is in fruit (approximately May to August). During these times, the Maijuna hunt in **ne cuadu** during both the day and night. To hunt during the

night, hunters commonly make hunting platforms close to *M. flexuosa* trees with fruits that show signs of being eaten by animals and wait with their flashlights and shotguns at the ready. A Maijuna male consultant explained how to hunt in **ne cuadu**:

> "Yes, you need to make your hunting platform to listen for paca (*A. paca*; **seme**, **oje beco**, **pɨbɨ aco**), armadillos (*Dasypus* sp.; **toto aquɨ**), and Brazilian tapirs (*Tapirus terrestris*; **bequɨ**, **jaico**) at night. Then they do not smell you fast because you are up above. It also facilitates to see down below with your flashlight… Black agouti (*D. fuliginosa*; **maitaco**, **moñeteaco**, **codome**), South American coati (*Nasua nasua*; **chichibɨ**), collared peccary (*Tayassu tajacu*; **caocoa, yau**), and white-lipped peccary (*Tayassu pecari*; **sese, bɨdɨ**) come during the day to eat **ne** (*M. flexuosa* fruits) and so you can kill them during the day."

According to consultants, the following animals also eat *M. flexuosa* fruits and are therefore hunted and killed in this habitat when encountered: green acouchys (*Myoprocta pratti*; **maso**), monk saki monkeys (*Pithecia monachus*; **baotutu**), red howler monkeys (*Alouatta seniculus*; **jaiquɨ**), among others. Although hunters target *M. flexuosa* palm swamps when *M. flexuosa* is in fruit, hunters may also pass through these areas during other times of the year killing game animals when encountered.

Among the many *M. flexuosa* palm swamps found within Sucusari two have proper names. The first one is what the Maijuna call **Ogo bai cuadu** or **Ogo bai ne cuadu**. According to consultants this is a very large *M. flexuosa* palm swamp found far upriver from the main community toward the headwaters of the Sucusari River (in the area that the Maijuna traditionally inhabited). Most consultants interviewed have never visited **Ogo bai cuadu**, due to its distance from where the Maijuna currently reside, yet all of them have heard of it. This *M. flexuosa* palm swamp is named after a supernatural being that the Maijuna call **Ogo bai**. According to consultants, this supernatural being resides in large *M. flexuosa* palm swamps and likes to abduct people to eventually eat them. **Ogo bai** mainly abducts children but also rarely preys on adults. This supernatural being is usually invisible yet, when presenting itself to

children, it takes on the form of a women that looks like the child's mother in an attempt to lure and deceive the child. It is unclear as to exactly why this particular **ne cuadu** is referred to as **Ogo bai cuadu** considering the fact that **Ogo bai** is said to inhabit all large *M. flexuosa* palm swamps. One interesting explanation was provided by a Maijuna male consultant: "Some say that **Ogo bai** abducts people and it is for that reason we say **Ogo bai ne cuadu**. There is an **Ogo bai** in this **Ogo bai ne cuadu**. Some of our ancestors saw this **Ogo bai**." Interestingly, there are no taboos associated with entering or harvesting resources from this area and, according to consultants, individuals can hunt and collect in **Ogo bai cuadu** as they see fit.

Bellier (1993b, 1994) also provides a description of **Gogobai**[5] (**Ogo bai**) that in many ways is different than what is presented here. For example, she states that **Gogobai** is the "madre de la selva" ("mother of the forest") and that all of the animals of the forest are her personal creatures. According to consultants interviewed for this study, **Ogo bai** only resides in *M. flexuosa* palm swamps and does not have a special association with animals. Even though there are several other differences in her explanation of **Gogobai**, some similarities do exist between what she describes and what I have learned during the course of this study. For example, she states that **Gogobai** is a woman that sometimes abducts solitary hunters. According to Bellier (1993b), **Gogobai** also occasionally devours the souls of her captives.

The second *M. flexuosa* palm swamp with a proper name is called **toto cuadu**. **Toto** is the Maijuna word for a type of grayish clay that is used in the production of ceramics (Table 2-10) and therefore **toto cuadu** literally translates as 'clay in soft earth'. According to consultants, this *M. flexuosa* palm swamp is called **toto cuadu** because Maijuna ancestors observed exposed soil in this palm swamp that looked like **toto**. It is important to note however that the soil found

in this **ne cuadu** is not harvested and used by the Maijuna in the production of ceramics as is regular **toto**.

In my opinion, *M. flexuosa* palm swamps (**ne cuadu**) are perfect examples of what Posey (1984) referred to as "resource islands". According to Posey (1984: 117), "resource islands" are "…areas in the primary forest where specific concentrations of useful plants or animals are found." Posey (1984) provides several general examples of "resource islands", including palmito and palm nut sources, areas with cane for arrows, hunting areas, fish concentrations, sources of palm hearts, among others. According to Posey (1984), "resource islands" and their man-made counterparts, "forest-fields", allowed the Kayapó of the Brazilian Amazon to travel for several months without relying on domestic agricultural produce. Unfortunately, it is unclear whether or not Posey (1984) was referring to specific habitats or just areas in general that provided concentrations of resources yet I feel that this concept can be easily extended to describe many of the Maijuna recognized habitats. For example, most Maijuna recognized habitats are dominated by ethnobotanically and/or economically important plant species and can therefore be considered "resource islands". As previously stated, the forests of Amazonia are characterized by very high diversity and generally low frequency of plant species and therefore Maijuna habitats dominated by ethnobotanically and/or economically important plant species can easily be envisioned as "islands" in a "sea" of otherwise undifferentiated forest (**maca**).

In addition to **ne cuadu**, a variety of other habitats found in swampy areas are also recognized by the Maijuna of Sucusari (Table 2-3). Several of these habitats are dominated by palm species, including swamps dominated by *Euterpe precatoria* (**ɨmɨbi cuadu, ɨmɨbɨe cuadu**) (Figure 2-4), *O. bataua* (**bosa cuadu, osa cuadu**), *Socratea exorrhiza* (**jɨ̱co cuadu**), *Astrocaryum murumuru* (**chida cuadu**), and *Bactris concinna* (**bi cuadu**). These palms, and consequently

these habitats, provide a variety of important and minor plant products to the Maijuna and therefore they vary in overall importance (Table 2-11). For instance, the Maijuna harvest the palm hearts of *E. precatoria* to occasionally sell and they collect the fruits of *O. bataua* to eat, to make a beverage, and to process into an oil. The Maijuna also use the trunks of both *S. exorrhiza* and *A. murumuru* for a variety of construction needs, among other things. One of the more unique uses of these species includes the past use of sharpened leaf base fibers of *O. bataua* to pierce Maijuna men's ears in preparation for inserting the ear disks that they traditionally wore.

The Maijuna also recognize two swampy habitats identified and named after plants in the family Cyclanthaceae. These habitats are swampy areas with an understory dominated by the plant *Carludovica palmata* (**s̈inodei cuadu**) or *Asplundia* sp. (**noca cuadu**). **S̈inodei cuadu** is an especially rare and small habitat found in primary forest. This habitat was only observed in one area located in poorly drained upland forest. It is not known whether or not this is a seral habitat in a disturbed area (i.e. a tree fall gap, etc.) yet it may be considering that *C. palmata* tends to grow in open places (Bennett et al. 1992). Interestingly, the *Asplundia* sp. dominating the habitat **noca cuadu** is not used in any specific way by the Maijuna of Sucusari yet its dominance in this habitat makes it a salient indicator species nonetheless.

In addition, the Maijuna also identify four other habitats that are generally found in swamps with high to dominant concentrations of *M. flexuosa* (**ne ñi**) in the overstory. For example, the habitat **cudu cuadu** has stands of the ethnobotanically useful tree **cudu ñi** (*Virola* spp.) (Table 2-11) and generally also has high concentrations of *M. flexuosa* which may in fact be dominant. The Maijuna consider these areas to be distinct from normal *M. flexuosa* palm swamps (**ne cuadu**) because they contain higher than normal concentrations of **cudu ñi** (*Virola* spp.). Therefore, the Maijuna recognize subtle differences in population levels of individual

species and name habitats accordingly. When it comes to naming and classifying this habitat, the Maijuna place more importance on **cudu ñi** (*Virola* spp.) regardless if *M. flexuosa* is dominant or not. Traditionally, the fruits of **cudu ñi** (*Virola* spp.) were harvested by the Maijuna to eat their edible arils yet this species has recently gained more prominence as an economically valuable timber species currently being selectively logged within the Sucusari River basin. The habitat **maja cuadu** is very similar to **cudu cuadu** except it has diffuse stands of the ethnobotanically important tree species *Symphonia globulifera* (see Table 2-11) instead of stands of *Virola* spp. It is named and classified in much the same way as **cudu cuadu**. The Maijuna also identify swamp habitats that have an understory dominated by either the useful plant *Calathea lutea* (**bijao cuadu, nuta jao cuadu**) or the fern *Cyathea pungens* (**abio cuadu, abi cuadu**) (Figure 2-4) and an overstory that is dominated by *M. flexuosa*. In naming and classifying these habitats the Maijuna are obviously giving more importance to the dominant understory plants *C. lutea* or *C. pungens* than to *M. flexuosa*. Interestingly, *C. pungens* is not an ethnobotanically useful plant species yet its thorny and dominant nature makes it a salient indicator plant species. **Bijao** is a local name for *C. lutea*, and not a Maijuna name, and as a result the habitat term **bijao cuadu** is a mixture between local and Maijuna words.

In addition to swamp habitats, the Maijuna of Sucusari also identify four habitats defined by indicator plant species or plant life forms located in areas with 'ugly forest' (Table 2-4). The names of these habitats are generally constructed by joining the Maijuna name of the dominant indicator plant species or plant life form with the Maijuna word **aqui** which literally means 'ugly forest'. For instance, the Maijuna name and classify a type of forest that they call **bichi aqui** which literally translates as 'ugly forest of vines' (liana forest). **Bichi aqui** are very dense forests composed of a variety of liana species and they are found in floodplain forest. The

remaining habitat types in this general category are named and identified based on dominant indicator plant species, instead of plant life forms. They include forests that are dominated by *Uncaria guianensis* and/or *Uncaria tomentosa* (**jeo aga aqui**), *Ischnosiphon puberulus* (**bibi aqui**), and *Mimosa myriadenia* var. *dispersa* or *Mimosa myriadenia* var. *punctulata* (**mio aqui**). It is also important to note that **mio aqui** is also sometimes simply called **mio siguidi** which is the proper name of both of the spreading vines *M. myriadenia* var. *dispersa* and *M myriadenia* var. *punctulata*.

All of the above-mentioned habitats located in areas with 'ugly forest' are very dense and generally uninviting places. For example, **jeo aga aqui** are low growing, very dense thickets that are found in floodplain forest along river margins. **Jeo aga** (*U. guianensis* and *U. tomentosa*) also has large thorns which make these areas even less inviting. **Mio aqui** are also very uninviting places due to the fact that both *M. myriadenia* var. *dispersa* and *M. myriadenia* var. *punctulata* are covered with small, yet very sharp thorns. These areas are very dense, low growing thickets and they are found in both floodplain forest along river margins and in old swiddens. **Mio aqui** that are located in old swiddens are dominated by *M. myriadenia* var. *punctulata* whereas *M. myriadenia* var. *dispersa* dominates **mio aqui** found along river margins. **Bibi** (*I. puberulus*), the dominant plant in **bibi aqui**, does not have thorns or spines yet these areas are still generally dense and "ugly" enough to normally deter individuals from entering them. **Bibi aqui** are also low growing and are found in floodplain forest.

Due to the very dense nature of all of these habitat types both vision and mobility tend to be very limited in these areas. As with the previously described habitat **aquibi** (Table 2-2), the Maijuna generally do not hunt, collect, or clear agricultural fields in any of these habitats. In short, their essentially impenetrable nature makes them very unappealing to the Maijuna and

therefore they generally avoid entering and/or utilizing these habitats altogether. For example, due to its thorny and dense nature, a Maijuna male consultant stated the following about collecting in a **jeo aga aqui**:

> "It is not possible to collect (*Socratea exorrhiza*) when it is inside of **jeo aga**, it cannot be collected. Because it is, as we were saying before, forbidden. You are not going to enter inside for one *casha pona* (local name for *S. exorrhiza*) tree being that there are still various to extract in other places…"

In addition, when asked about hunting in **bichi aqui**, the same Maijuna consultant simply stated: "It is the same as the **aquibi**, everything is the same, you cannot hunt. You cannot hunt… Because (it is a) **bichi aqui**, (there are) a lot of vines."

Upon examination, it becomes apparent that none of the habitats located in areas with 'ugly forest', including **aquibi**, can be classified as "resource islands". Further strengthening this assessment is the fact that none of the indicator plant species used to name and classify these habitats are utilized in any way by the Maijuna of Sucusari (see Table 2-11). Instead of being considered "resource islands" these habitats should be classified as "avoidance islands" considering that the Maijuna generally avoid entering and/or using these areas. In general, "avoidance islands" are defined here as areas in primary or secondary forest that are generally avoided due to the plants or animals that are present and/or cultural beliefs (i.e. taboos, etc.) associated with them.

A number of forest habitats defined by indicator plant species or plant parts that are not located in areas with 'soft earth' or 'ugly forest' are also identified by the Maijuna of Sucusari (Table 2-5). Generally speaking, these habitats are found in both floodplain and upland forest. Interestingly, several of these habitat types are named and classified based on dominant indicator plant species that also form Maijuna recognized swamp habitats. All of these habitats are dominated by and named after palm species, including forests dominated by *O. bataua* (**bosa nui**

nɨcadadi, osa nui nɨcadadi), *S. exorrhiza* (**jɨ̱co nui nɨcadadi**), and *A. murumuru* (**chida nui nɨcadadi**). The Maijuna consider these to be distinct forest types from their swampy counterparts (i.e. **bosa cuadu**/**osa cuadu**, **jɨ̱co cuadu**, and **chida cuadu**, respectively) because they are found in non-swampy areas or areas with firm soil and good drainage. As noted by a Maijuna male consultant when asked to explain the habitat **osa nui nɨcadadi**: "**Osa** (*O. bataua*) is dominating there, there are small and large (individuals of *O. bataua*)… This is different than **osa cuadu** because it is in hard earth."

A variety of other palm forests that are not located in areas with 'soft earth' or 'ugly forest' are also identified by the Maijuna of Sucusari (Table 2-5). Several of these habitats are located in upland forest, including those habitats that are identified and named after *Lepidocaryum tenue* (**mɨ̱ibɨ, mɨ̱i nui nɨcadadi**), *Phytelephas macrocarpa* (**mɨ̱ibɨ, mɨ̱i nui nɨcadadi**), *Geonoma juruana* (**tɨ̱tɨ̱ mɨ̱i nui nɨcadadi, tɨ̱tɨ̱ mɨ̱i coti**), *Attalea racemosa* (**edi nui nɨcadadi, edi coti**), *Attalea maripa* (**a̱jo̱ edi nɨcadadi, edi nui nɨcadadi**), *Itaya amicorum* (**ta̱tidi nui nɨcadadi, ta̱tidi coti**), and *Iriartea deltoidea* (**oda nɨcadadi, jai oda nui nɨcadadi**). A type of floodplain forest that has an understory dominated by the palm *Geonoma macrostachys* var. *acaulis* (**nɨ̱nɨ̱ ñi**) is also recognized and named **nɨ̱nɨ̱ nui nɨcadadi**. Additionally, the Maijuna also identify a successional forest habitat that is found in old swiddens and dominated by the understory palm species *Bactris macroacantha* (**bi nui nɨcadadi**).

All of the above-mentioned palm species, and therefore their respective habitats, are useful in different ways and to different degrees (Table 2-11). For example, the leaves of the understory palm *L. tenue* (**mɨ̱i ñi**) are used by the Maijuna to thatch houses. This palm is commonly used as thatch throughout the Peruvian Amazon when and where it is abundant (Duke and Vasquez 1994; Kahn and Mejia 1987). The Maijuna weave the leaves of *L. tenue* around 3

meter long slats of wood made from the trunk of *S. exorrhiza*. These panels are called **mɨ̲i̲do** by the Maijuna and, according to consultants, each **mɨ̲i̲do** is composed of approximately 75 to 80 *L. tenue* leaves (**mɨ̲i̲ jao**). According to consultants, approximately 150 **mɨ̲i̲do** are needed to thatch the average sized Maijuna house which is 8 meters X 5 meters (40 m^2). Therefore, the average sized Maijuna house requires approximately 11,250-12,000 *L. tenue* leaves in total. It is also important to note that, the average roof in Sucusari lasts approximately 4-7 years depending on how densely the leaves are interwoven and how close the **mɨ̲i̲do** are hung to each other. Using these figures, it would therefore take approximately 225,000-240,000 *L. tenue* leaves every 4-7 years to thatch the 20 mono-familial and pluri-familial houses found in Sucusari!

Due to the large number of leaves that are required to thatch the houses found within Sucusari, **mɨ̲i̲bɨ** (upland forests with an understory dominated by the palm *L. tenue*) (Figure 2-5) are very important thatch collecting areas. The Maijuna target these "resource islands" year round to collect thatch. As a Maijuna male consultant explained when asked where he collects *L. tenue* leaves for thatch:

> "You go to an *irapayal* (local name for a *L. tenue* palm forest). You are not going to cut (*L. tenue* leaves) in another place, you must look for an *irapayal* to extract your leaves… When you look for (*L. tenue*) in another place you are not going to succeed. That (**mɨ̲i̲bɨ**) is the place where there is *irapay* (local name for *L. tenue*). For example, where there is **mɨ̲i̲** (*P. macrocarpa*) you are not going to go to look for **mɨ̲i̲** (*L. tenue*)... Each one has its place…"

The Maijuna commonly have *mingas*[7] (collective work parties that are common throughout the Peruvian Amazon) to harvest the leaves of *L. tenue* to use as thatch. If having a *minga* to collect the leaves of *L. tenue*, the male host of the *minga* brings participants to previously identified and appraised **mɨ̲i̲bɨ** with exceptionally high concentrations of *L. tenue* leaves to maximize success in collecting and minimize energy and time expended.

Maijuna individuals also occasionally sell **mɨ̲i̲do** (panels of woven *L. tenue* leaves) to individuals from surrounding communities along the Napo River. In addition to buying *L. tenue* leaves from Sucusari community members, individuals from other communities also occasionally illegally harvest *L. tenue* from Maijuna lands because they do not have access to this resource. As a Maijuna male consultant explained about a community along the Napo River: "They are poor, they do not have anything, they live on an island and there is not any (*L. tenue*). We are rich with (*L. tenue*) leaves, we have a lot."

Not all areas within the Sucusari River basin have *L. tenue* palm forests. For example, there are several extensive areas upriver from the main community that do not contain significant concentrations of this palm. Differences in the abundance of *L. tenue* in these upland areas may be due to several reasons. For example, within the Peruvian Amazon, Kahn and Mejia (1987) reported that differences in *L. tenue* density among different areas in upland forest are apparently due to forest dynamics whereas Vormisto (2002) reports that differences in soil properties also play a role in explaining these variations. Additionally, it is also plausible that these differences may sometimes be due to a local, historical extirpation of this species due to over harvesting, though there is no reason to believe that this has occurred in Sucusari. In areas where *L. tenue* palm forests (**mɨ̲i̲bɨ̲**) are absent the Maijuna generally do one of two things to obtain thatch for their houses. First, individuals and families that live in these areas may collect *L. tenue* leaves from sites downriver and transport their harvest upriver to use as thatch. Second, in the past, several Maijuna houses in these areas also used the palm *Geonoma juruana* as thatch. The Maijuna name for this palm species is **tɨ̲tɨ̲ mɨ̲i̲ ñi**, which literally means 'trumpeter's *L. tenue* tree' due to the fact that the long, thin stems of *G. juruana* remind the Maijuna of the long, skinny legs of the trumpeter bird (*Psophia* sp.; **tɨ̲tɨ̲**). In several upland areas upriver, *G. juruana*

is the dominant understory palm species and forms a habitat that the Maijuna refer to as **tɨtɨ mɨi nui nɨcadadi** or **tɨtɨ mɨi coti**. Interestingly, the only areas that this habitat has been observed in are those areas where *L. tenue* palm forests are absent. It is also important to note that, within Sucusari, *G. juruana* palm forests are much smaller in size and much less common overall than *L. tenue* palm forests.

As previously noted, the Maijuna also identify a type of upland forest with an understory dominated by the palm *P. macrocarpa* (**mɨibɨ, mɨi nui nɨcadadi**) (Figure 2-5). The Maijuna eat the liquid/immature endosperm of *P. macrocarpa* fruits and they also use the leaves of this palm to thatch temporary shelters and the ridges of roofs (Table 2-11). In the past, the Maijuna also collected the hardened endosperm of *P. macrocarpa* fruits for *patrones* as a source of vegetable ivory or tagua. In addition to collecting these different plant products in **mɨibɨ**, the Maijuna also consider this habitat to be the best area for clearing swiddens. According to consultants, **nea yao** ('black earth') (Table 2-10) is a characteristic feature of *P. macrocarpa* palm forests and **nea yao** that is found in this habitat is the preferred soil for agriculture. For example, when asked what habitat is best for clearing agricultural fields, a Maijuna male consultant explained:

> "*Yarinal* (local name for *P. macrocarpa* palm forests) is a lot better for making fields, everything grows, it is better when it is close… *Yarinal* has soil that is a little black, it is **nea yao**… *Yarinal* is better because it produces or yields more, large infructescences grow… **Ma yao** ('red earth') (Table 2-10) is good but *yarinal* is better. The infructescences in **ma yao** are not very big but in *yarinal*, **nea yao**, they are big, the plantains (*Musa* x *paradisiaca* L.) are very big… The best or the only one is **mɨibɨ** and after (that) they (the different habitats) are all the same."

A Maijuna female consultant also noted: "*Yarinal* is best, *yarinales* are good… It is best because it is **nea yao**… Everything grows in *yarinal*, **bea** (*Zea mays* L.) grows in *yarinal*." It should be noted that *P. macrocarpa* is also considered an indicator of rich agricultural soils by other local

farmers in the general area around Iquitos (Barfod 1991; Coomes 1995; Kahn and Mejia 1990; Mejia 1992; as cited in Vormisto 2002: 1037).

Although *P. macrocarpa* palm forests are considered the best areas for clearing swiddens, the Maijuna currently do not make their fields in this habitat. This is due to the fact that the Maijuna currently do not live close to *P. macrocarpa* palm forests. As a Maijuna male consultant explained:

> "Because there is not any close to here, there is only **ma yao** here and by necessity we make (fields) in **ma yao**… There is not any close, there is not any. The old-timers lived moving, they did not live in one single place. They lived in a place six months, a year, two years and then they moved to another place. Where my dad lived before (in between the Sucusari and Apayacu rivers) he made his fields in pure **mɨ̲ibɨ**."

When asked, at a later date, why they do not currently live close to *P. macrocarpa* palm forests this same consultant explained:

> "Well, right now we cannot live close to *yarinales* because we are closer to people (mestizos), now we are more with the schools, now you do not live apart from (others), now you do not live alone, you must work, do other things that the village needs. …now we do not live like they lived before. They lived in a place, a place where they wanted to make there houses and make their fields, no. …everything changes with the years…"

In short, cultural changes in lifestyle and residence patterns have severely impacted access to *P. macrocarpa* palm forests for agricultural purposes, ultimately affecting how the Maijuna of Sucusari interact with this habitat.

In addition to palm forests, the Maijuna of Sucusari also identify a variety of other habitats defined by indicator plant species that are not located in areas with 'soft earth' or 'ugly forest' (Table 2-5). These include seven different habitat types that are named and classified based on dicotyledonous trees species, several of which are ethnobotanically and/or economically useful (Table 2-11). For instance, two of these habitats are located in upland forest and are identified and named after diffuse stands of *Couma macrocarpa* (**bito nui nɨcadadi**) and

Cedrelinga cateniformis (**mɨani nui nɨcadadi, mɨani nɨcacoti**). **Mɨani nui nɨcadadi** is an especially rare habitat in Sucusari and is only known to exist (and therefore was only observed) in one area. Unfortunately, the habitat **bito nui nɨcadadi** was not observed at all because, according to consultants, it is only found in more remote areas of the Sucusari River basin and toward the Apayacu River, which is to the east of the Sucusari River. **Bito nui nɨcadadi** was an important habitat to the Maijuna in the past when they collected the latex of *C. macrocarpa* for *patrones*. The Maijuna also identify another forest habitat that they call **yaometo nui nɨcadadi** ('place where there is a lot of *Cedrela odorata*') which, as described by consultants, consists of diffuse stands of *C. odorata*. Regrettably, this habitat was not visited or observed because it is currently very rare, to non-existent, in Sucusari due to logging.

In addition, the Maijuna also identify a successional forest habitat dominated by *Cecropia* spp. (**maquɨ nui nicadadi, maquɨ nui baidadi**) that is found in both old swiddens and tree fall gaps within Sucusari. **Maquɨ nui nicadadi** ('place where there is a lot of *Cecropia* spp.') is also found along the Napo River and other large "white water" rivers (i.e. the Amazon River) in floodplain forest along river margins. Another habitat identified and classified by the Maijuna is an upland forest habitat that contains diffuse stands of the tree *Ficus insipida* (**maso nui nɨcadadi, maso nui baidadi**). This habitat is found in both old swiddens and primary forest. It is not clear whether this is a seral habitat when found in primary forest yet it may be considering the fact that Vásquez-Martínez (1997: 515) states that *F. insipida* (**maso ñi**) is found "in upland (tierra firme) or floodplain forest (planicie inundable), várzea, always in disturbed forests or in gaps of primary forest".

Perhaps the most interesting habitat, both ecologically and culturally, in this group is a habitat that the Maijuna call **mañaco taco** (Figure 2-5). **Mañaco taco** are dominated by the

small myrmecophytic tree or shrub *Duroia hirsuta* and they are found in upland forest. The most anomalous feature of a **mañaco taco** is its very open understory, which contrasts sharply with the normally dense Amazonian rain forest. According to Frederickson (2005) and Frederickson et al. (2005), the open understory of this habitat is due to *Myrmelachista* ants that clear the vegetation around *D. hirsuta* while the Maijuna contend that the understory vegetation in these areas is kept clear by male supernatural beings called **Ma baji** that reside in these forests.

In addition to clearing the understory of **mañaco taco**, the Maijuna also attribute several types of malevolent actions to **Ma baji**. For example, **Ma baji** can abduct young girls to raise them in **mañaco taco**, an act that is recounted in a traditional Maijuna story (see Chapter 3). According to consultants, **Ma baji** also sometimes rob the spirits or souls of babies and small children, eventually killing them, and they also rarely kill adults. Due to the fact that **Ma baji** can harm babies and small children, Maijuna parents traditionally did not enter **mañaco taco** while accompanied by their children; instead they avoided entering these areas all together by walking around them. Even though the Maijuna currently do not follow this traditional practice, this habitat in a traditional context can reasonably be considered an "avoidance island" in certain situations based on the protective actions of Maijuna parents.

The Maijuna do not use *D. hirsuta* (**mañaco ñi**) for anything (see Table 2-11), out of fear of something bad happening to them, yet it is not surprising that they classify these areas as separate and distinct habitats due to their atypically open understory and generally distinct appearance. In addition to not using *D. hirsuta*, the Maijuna also do not clear swiddens in these areas. The Maijuna do however freely hunt and kill animals in this habitat. It is also important to note that the local name of this habitat is *supay chacra* which literally means 'devil's swidden'. As indicated by the local name of this habitat, mestizos and other local inhabitants in

this general part of the Peruvian Amazon also have interesting traditional beliefs associated with these areas. As Duke and Vasquez (1994) generally state, "Rural people (in the Peruvian Amazon), superstitious about the "Supay chacra", avoid walking nearby." It is unclear as to how Maijuna traditional beliefs specifically compare or contrast to the local beliefs associated with this habitat due to the fact that this was outside of the realm of this study.

Several other habitats, not located in areas with 'soft earth' or 'ugly forest', are also recognized by the Maijuna of Sucusari (Table 2-5). These habitats are identified by herbaceous plants, plant parts, or vines. Two of these habitats are made up of ethnobotanically useful species (see Table 2-11), including **bati o nui nɨcadadi** ('place where there is a lot of *Heliconia standleyi*') and **bea jao nui nɨcadadi** ('place where there is a lot of *Cyclanthus* sp.'). **Bati o nui nɨcadadi** consists of small stands of the understory plant *H. standleyi* (**bati o**). The Maijuna occasionally use the leaves of *H. standleyi* as thatch for temporary shelters and as temporary "plates" or "tables" while in the forest. **Bea jao nui nɨcadadi** is a successional forest habitat found in old swiddens that consists of diffuse stands of the understory plant *Cyclanthus* sp. (**bea jao**). The leaves of **bea jao** are used to wrap and cook food in (i.e. fish, fruits, etc.) and they are also used for storing salt. The Maijuna also identify an upland forest habitat called **maca bichi nui nɨcadadi** that consists of small, dense stands of the understory plant *Ananas ananassoides* (**maca bichi**). **Maca bichi** (*A. ananassoides*), which literally translates as 'forest pineapple', is not an ethnobotanically useful species yet dense stands of this pineapple-looking plant do not go unnoticed and unnamed by the Maijuna. As previously discussed, the Maijuna also identify a type of very dense, low growing thorny thicket called **mio s̲iguidi** or **mio a̲qui** that is dominated by either *M. myriadenia* var. *dispersa* or *M. myriadenia* var. *punctulata*. Again, the name **mio s̲iguidi**, one of the names for this habitat, is also the proper name of both of the spreading vines,

M. myriadenia var. *dispersa* and *M. myriadenia* var. *punctulata*, that dominate this habitat. This habitat appears in both Tables 2-4 and 2-5 because, depending on the person, it can be named and classified in two ways.

In addition, the Maijuna also identify a type of upland forest habitat that they call **ñajį coti** ('flat or level surface with soil covered by a lot of small roots'). This habitat is identified based on the fact that the soil in these areas is covered by a relatively thick mat of fine roots. According to consultants, this habitat is not suitable for agriculture. As a Maijuna female consultant explained:

> "(It is) pure small roots, no more, covering the soil, it is soft. It is not good for anything. This is no good for growing plants because it is very dry. This forest is not good, the stems of yuca (sections of yuca stems that are planted) dry up or wither."

A Maijuna male consultant also simply stated: "I do not make swiddens here because there are a lot of roots." Two of the oldest Maijuna consultant interviewed also stated that another habitat named **mɨmɨdi nui nɨcadadi** ('place where there is a lot of *Selaginella stellata*') is also not suitable for agriculture. **Mɨmɨdi nui nɨcadadi** is a successional habitat found in old swiddens in upland areas with an herbaceous layer dominated by *S. stellata*. As one of the two consultants stated:

> "My father taught me. When we looked in the center (of the forest) for a place to make a swidden he told me where there is **mɨmɨdi**, a lot of **mɨmɨdi**, it is not good to make a swidden, (plants) do not grow well, and we selected other places where there is not any."

It is important to note that some of the other consultants interviewed did not share these same reservations about clearing and making agricultural fields in this habitat. Whether this is an example of the degradation and loss of traditional knowledge is speculative.

Disturbed habitats:

The vast majority of the Sucusari River basin is covered in primary rain forest yet there are patches of secondary forest scattered throughout this area. The Maijuna identify several types of disturbed or successional habitats, either human induced or naturally occurring, within Sucusari (Table 2-6). Table 2-6 does not include those successional habitats identified by indicator plant species (see Tables 2-3, 2-4, and 2-5). Notably, there is no Maijuna term that refers to all types of secondary forest in general. Even though the Maijuna do not have a named category for secondary forest they do, however, recognize several characteristics that make all secondary forest habitats different from primary forest (**maca**) and therefore secondary forest can be considered an unnamed category within the Maijuna habitat classification system.

The Maijuna practice swidden-fallow agriculture which produces a mosaic of successional habitats, both old and new, across the landscape. The general term for swidden in Maijuna is **yio**. The vast majority of Maijuna swiddens within Sucusari are cleared in upland forest and they are generally planted with *Manihot esculenta* Crantz, *Musa* x *paradisiaca*, and a variety of other minor crops (i.e. *Saccharum officinarum*, *Ananas comosus* L., among many others). Overall, Bellier (1993b, 1994) provides a very good description of the swidden-fallow agricultural system of the Maijuna, including the different stages involved in making a swidden, the role of men and women, and the use of *mingas*, among other things. In addition to obtaining agricultural produce from swiddens the Maijuna also hunt in these areas year round. According to consultants, several animal species eat agricultural produce within swiddens and are therefore commonly hunted in these areas, including black agouti (*D. fuliginosa*; **maitaco**, **moñeteaco**, **codome**) and green acouchys (*M. pratti*; **maso**) during the day and paca (*A. paca*; **seme**, **oje beco**, **pɨbɨ aco**) and **ñacochi** (unknown species of forest rat) at night.

Several successional stages of swidden fallows are also recognized by the Maijuna of Sucusari. For example, recently fallowed swiddens containing immature secondary forest are identified and named **aiyio** or **doe yio**. The Maijuna generally refer to a swidden as an **aiyio** after it is approximately 2-3 years in age. Although **aiyio** are fallowed areas they are not abandoned areas. The Maijuna continue to harvest fruits and other types of agricultural produce from a variety of different species, including *M.* x *paradisiaca*, *Bactris gasipaes* Kunth, *Pourouma cecropiifolia* Mart., etc., from these areas. It is important to note that *M. esculenta* is generally not present or harvested in **aiyio**.

The Maijuna also identify a specific type of swidden fallow that they create and manage called an **ɨne yio**. **ɨne yio** are swidden fallows that are dominated by the domesticated palm *B. gasipaes* (**ɨne ñi**). *Bactris gasipaes* are planted early in new swiddens because they take several years to fruit. They are protected by the Maijuna, generally by weeding the areas around them, as they grow and mature within both active swiddens and fallows. For instance, within **ɨne yio**, the bases of *B. gasipaes* palms are cleared and weeded by the Maijuna each time that fruit is harvested. This serves to thin out competing plant species and ensures that *B. gasipaes* will continue to bear fruit in the future.

Bactris gasipaes is a very ethnobotanically important species with the fruits being the most important plant part obtained from this palm (Table 2-11). The fruits of *B. gasipaes* are prized by the Maijuna and they constitute a significant part of the Maijuna diet when they are in fruit. They are eaten cooked and processed into a fermented beverage (**ɨne ono**), a type of soup (**biadaca**), and an oil (**biyadaca**). The fruits are also used as animal feed and processed into a type of fishing bait (**ɨne ada**). Within Sucusari, *B. gasipaes* fruits are available twice a year. The primary fruiting season is from approximately January to May with a modest, secondary fruiting

season occurring from approximately July to September. Needless to say, **ɨne yio** become important fruit collecting areas during these times. A variety of animals also eat *B. gasipaes* fruits and are therefore hunted in **ɨne yio** when **ɨne ñi** is in fruit. According to consultants, the following animals are hunted in **ɨne yio**: paca (*A. paca*; **seme**, **oje beco**, **pɨbɨ aco**), black agouti (*D. fuliginosa*; **maitaco**, **moñeteaco**, **codome**), green acouchys (*M. pratti*; **maso**), South American coati (*Nasua nasua*; **chichibɨ**), and armadillos (*Dasypus* sp.; **toto aquɨ**).

The significance of *B. gasipaes* (**ɨne ñi**) to the Maijuna goes beyond just the ethnobotanical uses described above. In addition to using the fruits of *B. gasipaes* for normal utilitarian purposes, the fruiting cycle of *B. gasipaes* is traditionally used by the Maijuna to help keep track of the seasons (Bellier 1993a, 1994; Gilmore per. obs.). As Bellier (1993a, 1994) explains, the Maijuna traditionally divide the year into three main seasons, one of which is called **ɨnenu** ('time of *B. gasipaes*'). **ɨnenu** is named after and occurs during the primary fruiting season of *B. gasipaes*. Additionally, the primary fruiting season of *B. gasipaes* is also traditionally used by the Maijuna to calculate time on a yearly basis by serving as a reference point in the past and the future (Bellier 1993a, 1993b, 1994; Gilmore pers. obs.). Several Maijuna elders within Sucusari continue to use *B. gasipaes* in both of these ways. Also highlighting the significance of *B. gasipaes* to the Maijuna is the fact that it was the subject of a traditional Maijuna ritual, part of which took place in **ɨne yio**. Bellier (1993a, 1993b, 1994) provides a good explanation and description of this traditional ritual and its significance to the Maijuna. This traditional ritual was not observed during the course of this study because it has not occurred within the Sucusari community for some time. It should also be noted that several other agricultural species were the subject of traditional rituals, including *M. esculenta* (Bellier 1993a, 1993b, 1994).

Very old swidden fallows with mature secondary forest are called **ai bese yio** or **doe bese yio** by the Maijuna. These are the swidden fallows of Maijuna elders and ancestors. **Ai bese yio** are identified by the Maijuna based on memory, oral history, characteristic plant species, etc. According to consultants, several successional plant species are characteristic of these areas and are therefore used as indicator plant species in distinguishing **ai bese yio** from primary forest, including *Cecropia* spp. (**maquɨ ñi**), *Miconia minutiflora* (Bonpl.) DC. (**ɨtayo ñi**), *Croton palanostigma* Klotzsch (**edo ñi**), *O. pyramidale* (**yibi ñi**), *F. insipida* (**maso ñi**), *Xylopia sericea* A. St.-Hil. (**jati ñi**), and *Guatteria latipetala* R.E. Fr. (**neaca ñi**). In addition, a type of cultivated fish poison or barbasco that the Maijuna call **suña eo** (*Lonchocarpus nicou* (Aubl.) DC) may also persist in these areas.

In addition to the above-mentioned habitats, the Maijuna also identify a variety of other disturbed areas. For example, the Maijuna name for an occupied house site is **ue taco** ('open area with a house'). **Ue taco** are cleared areas around Maijuna houses. These areas generally contain a variety of cultivated plants used for food, medicines, condiments, and the production of crafts, among other things. Not surprisingly, Maijuna houses (**ue**) and their associated **ue taco** are the epicenter of Maijuna family life. The Maijuna identify two different successional stages associated with abandoned house sites, including **ai taco** or **doe taco** and **ai bese taco** or **doe bese taco**. **Ai taco** are recently abandoned house sites that contain immature secondary forest whereas **ai bese taco** are very old or ancient house sites that contain mature secondary forests. Both are identified in a variety of ways, for example, **ai bese taco** are identified based on memory, oral history, indicator plant species, and/or the presence of pottery shards. The Maijuna also identify two different disturbed areas that they call **jaiya vaca taco** ('open area with cattle') and **mai tate taco** ('open area to sow people'), respectively. **Jaiya vaca taco** are pastures for

raising cattle and/or water buffalo whereas **mai tate taco** are cemeteries. According to consultants, Maijuna ancestors generally burned their dead and therefore the clearing, use, and existence of cemeteries within Sucusari is a somewhat recent and nontraditional phenomenon.

The Maijuna of Sucusari also identify two types of tree fall gaps that they call **tutu badu yio** and **cuese badu**, respectively. **Tutu badu yio** are natural tree fall gaps that are caused by the wind. Several consultants stated that their ancestors used to plant fields in natural tree fall gaps (**tutu badu yio**) in the past before the Maijuna obtained metal axes and machetes. As one consultant explained about **tutu badu yio**:

> "This is a swidden that the wind makes in the **maca** (forest). There are places of good size, more than 500 meters in size… Our ancestors looked for these to make swiddens because there were no axes, there was nothing. They looked for a swidden of the wind to grow something to eat… The wind always did a favor for our ancestors so they could make their swiddens."

Cuese badu are different than **tutu badu yio** in that they are human induced gaps instead of being naturally caused. **Cuese badu** are caused by a variety of human activities. For example, they are created when trees are felled for canoe construction, selective logging, the harvesting of fruits and honey, etc.

Habitats defined by indicator animal species:

Eight habitats are identified by the Maijuna of Sucusari based on indicator animal species (Table 2-7). Perhaps the most important habitat in this group is what the Maijuna call **tuada** or **onobɨ**. These areas are animal mineral licks that are found in both floodplain and poorly drained upland forest. Animal mineral licks are important hunting areas for the Maijuna due to the fact that a number of animal and bird species visit these areas year round. According to Maijuna consultants nine different animal and bird species are encountered and hunted in these areas

(Table 2-8). Approximately 20 different animal mineral licks within the Sucusari River basin have proper Maijuna names while there are a number of others that go unnamed. The Maijuna name animal mineral licks after animals, people, plants, and hunting dogs, among other things. The extensive naming of animal mineral licks further highlights their importance to the Maijuna.

The Maijuna also identify a type of forest that they call **bai baidadi** ('place where animals live'). **Bai baidadi** are areas with high concentrations of game animals and may be located in both floodplain and upland forest. Presently, **bai baidadi** are very rare to non-existent in areas close to the Sucusari community due to over hunting. **Bai baidadi** are currently found in more remote areas within the Sucusari River basin and hunters visit these areas during extended hunting trips. In addition to **bai baidadi** the Maijuna also recognize **naso baidadi** ('place where *Lagothrix lagothricha* lives') and **meniyo baidadi** ('place where an unidentified turtle species lives'). These are forests that have high concentrations or large populations of common woolly monkeys (*L. lagothricha*) or an unidentified turtle species, respectively. According to consultants, **naso baidadi** may be found in both upland and floodplain forest in general, whereas **meniyo baidadi** are generally found in swamps in these areas. As is the case with **bai baidadi**, both **naso baidadi** and **meniyo baidadi** are currently very rare to non-existent in areas close to the Sucusari community due to over hunting and they are therefore only found in more remote parts of the forest. It is not known exactly why the Maijuna only identify forests based on high concentrations of *L. lagothricha* and an unidentified turtle species and not other species of animals. One reason why they identify **naso baidadi** may be due to the importance and indispensable nature of common woolly monkeys in the traditional Maijuna ritual associated with *B. gasipaes* (**ɨne ñi**). Bellier (1993a, 1993b) provides a very good explanation of the importance and symbolic meaning of common woolly monkeys in this ritual.

Collared peccary (*Tayassu tajacu*) mud wallows (**caocoa abɨda, caocoa abɨdadi**) are also recognized and named by the Maijuna. These mud wallows are commonly found at the bases of overturned trees and they are found in both upland and floodplain forest. According to consultants, collared peccaries generally visit and use these areas during dry periods and they are therefore good places to hunt during these times. As a Maijuna male consultant explained:

> "...They have a circle of (about) 3 meters in length and 2 meters wide and it is pure (muddy) earth. This is a place especially for the *sajinos* (local name for *T. tajacu*) to bathe. They do not bathe in the river… They (the mud wallows) are in upland forest, floodplain forest… In winter (meaning during rainy times) they do not bathe much or look for their mud wallows because there is a lot of rain… It is very easy to hunt or to kill a *sajino* in summer (meaning during dry times) at their mud wallows. You climb up a tree and wait for the *sajinos* (to come)…"

Several consultants stated, during the course of this study, that collared peccaries are presently not as common in Sucusari as in the past which may be due to over hunting. Therefore, it can be assumed that this habitat is currently quite rare in areas close to the Sucusari community.

The Maijuna also recognize three different habitats that are identified based on indicator ant species. For example, **mucu baidadi** or **mucu taco** are forests where there are high concentrations of an unidentified species of biting ant whereas **jaiquɨ baidadi** are forests with high concentrations of an unidentified species of stinging ant. Both of these habitats are found in old swiddens and primary forest. The Maijuna generally do not make houses, fields, hunting camps, etc. in these habitats due to the fact these ants bite or sting, respectively. In addition to causing discomfort due to stinging, consultants also stated that **jaiquɨ** (the unidentified species of stinging ant) can cause blindness if they enter your eyes. Although individuals may pass through **mucu baidadi** and **jaiquɨ baidadi** rapidly the Maijuna generally avoid longer term contact with these habitats and therefore they may reasonably be considered "avoidance islands". The Maijuna also identify a type of ant forest that they call **meca baidadi** or **meca tɨtɨ**. These forests

contain subterranean leaf cutter ant nests and therefore high concentrations of leaf cutter ants. **Meca baidadi** are found in both old swiddens and primary forest. According to consultants, leaf cutter ant nests are only found in upland forest yet their trails may also be found in floodplain forest when it is not flooded. These areas are not suitable for agriculture because leaf cutter ants defoliate fields.

Aquatic habitats:

Throughout Amazonia are different aquatic habitats (i.e. rivers, lakes, etc.) that bisect both upland and floodplain forest. The Maijuna classify and name a variety of these aquatic habitats found within and around their traditional territory (Table 2-9). For example, the Maijuna word for river or stream in general is **yiaya** whereas they call lakes **chitada**. Lakes are also occasionally called **cochada** which is a mixture between Spanish and Maijuna. The Maijuna recognize three different classes or sizes of rivers and streams and these include **jaiya** ('large river'), **jaicuya** ('medium river'), and **yadiya** ('small stream'). The Sucusari River is considered a **jaicuya** whereas the Napo River is considered a **jaiya**. There are a large number of small streams (**yadiya**) that bisect the Sucusari landscape and all but a few minor streams have proper Maijuna names (Appendix I). The Maijuna also identify two different classes or sizes of lakes: **yadi chitada** ('small lake') and **jai chitada** ('large lake'). The Maijuna call large oxbow lakes along the Napo River **jai chitada** and this type of lake is not found within the Sucusari River drainage basin. According to Maijuna consultants, only **yadi chitada** are found within Sucusari and the few **yadi chitada** that are found there are all located within floodplain forest and they are all characterized by the presence of **nea daca** ('black water').

The Maijuna of Sucusari also recognize a variety of river and stream parts, including the mouth (**yiaya sado**) and headwaters (**yiaya sani**) of rivers, straight segments of rivers (**doaya**), and river bends (**yiaya tego**). River bends may or may not contain what the Maijuna call **yiada** ('deep pools'). There are several **yiada** found along the length of the Sucusari River and they are important fishing areas for the community. Of the fourteen **yiada** mapped during a cognitive mapping exercise with a group of Maijuna consultants (see Appendix I), all of them had proper Maijuna names and all but three of them were designated (along with other places) as areas that the Maijuna target for fishing, highlighting their significance to the Maijuna.

The Maijuna also identify areas in rivers that they call **yiaya jeo ma dadi**. **Yiaya jeo ma dadi** are parts of rivers or streams that are slow moving compared to other parts due to an obstruction or because they are sheltered. These areas are generally found along the edges of rivers and streams and they are ephemeral by nature, that is their exact locations change with the rise and fall of river levels. The Maijuna fish in these areas when the rest of the river is flowing fast. As one Maijuna male consultant explained while fishing:

> "(A **yiaya jeo ma dadi** is) a piece of river that does not flow… (They are found) only in the edges or borders of rivers… When (the river) flows you cannot fish in the middle or center (of the river), it carries your fishing hook. But in the **yiaya jeo ma dadi**, no, it does not carry it."

Finally, as previously explained, the Maijuna also recognize **yiaya unu** and **chitada unu**, both of which are parts of either rivers or lakes, respectively. They have been included here again because, in addition to their terrestrial portions, these habitats also include the edges of rivers and lakes, respectively, and they therefore are partially aquatic by nature.

Soil classification:

In addition to classifying various terrestrial and aquatic habitats the Maijuna also have an extensive soil classification system (Table 2-10). The Maijuna term for soil or earth in general is **yao**. **Yao** also refers to any type of soil that is not further classified by the Maijuna as a more specific type. The Maijuna identify nine different types of soil based on color, texture, and composition. For example, four different soil types are classified based on color, including **nea yao** ('black earth'), **ma yao** ('red earth'), **s̶i̶ño yao** ('yellow earth'), and **bo yao** ('white earth'). **Nea yao** and **ma yao** are both found on land and along exposed river banks. As previously discussed, **nea yao** is a characteristic feature of **m̶i̶i̲b̶i̶** (*P. macrocarpa* palm forests) and **nea yao** that is found in this habitat is the preferred soil for agriculture. Unfortunately, the Maijuna do not have easy access to **m̶i̶i̲b̶i̶**, and its accompanying **nea yao**, and instead have to make their swiddens in other habitats and soil types. **Ma yao** is very common in the general vicinity of the Sucusari community and, although it is not the preferred soil for swiddens, it is still suitable for agriculture. According to Maijuna consultants, **s̶i̶ño yao** and **bo yao** are generally only encountered in exposed river banks. Due to this fact, the Maijuna obviously do not make swiddens in these soils. **Ma yao**, **s̶i̶ño yao** and **bo yao** found along exposed river banks all have a high clay content and they all were previously used by the Maijuna of Sucusari to draw designs on and paint ceramic jars (**neno**). Interestingly, Bellier (1993b, 1994) only mentions the use of **ma yao** and **s̶i̶ño yao** in painting ceramics yet, according to consultants interviewed for this study, **bo yao** was also used.

Several soils are also classified based on texture and composition, including **meja yao** ('sandy earth'), **ata yao** ('earth with small stones'), **meja** ('sand'), and **toto** ('clay'). Both **meja yao** and **ata yao** are found on land. **Meja yao** (i.e. sandy loam, sandy clay loam, or sandy clay)

is suitable for agriculture whereas **ata yao** is not. **Meja** is different from all of the above mentioned soils in that it is not found within the Sucusari River basin. **Meja** is pure sand and it is found on exposed beaches or fluvial bars of large rivers like the Amazon and Napo rivers of the Peruvian Amazon.

Toto, a gray colored clay that is found along exposed river banks, is used in the production of ceramics by the Maijuna. According to consultants, several types of ceramics were traditionally made by the Maijuna, the most popular or important being ceramic pots (**cuacodo**) and ceramic jars (**neno**). Bellier (1993a, 1993b) provides a very good explanation of the practical and symbolic importance of **cuacodo** to the Maijuna and also describes the general steps in the production of ceramics (and the role of both men and women in this process). Presently, only two older Maijuna women in the Sucusari community still make ceramic pots (**cuacodo**) and no one currently makes ceramic jars (**neno**). One Maijuna male consultant explained:

> "…We do not make (ceramic) jars (**neno**) and clay pots (**cuacodo**) now because there are (metal) pots and (plastic) buckets. It is not the same now, there are (metal) pots and (plastic) buckets and you do not see (ceramic pots and jars) anymore… Only Isidora and Nancy, no more, only they make clay pots, **cuacodo**."

In the future, it is anticipated that ceramics will no longer be made in the Sucusari community considering that no younger Maijuna women are currently partaking in this traditional activity.

In addition to the above-mentioned soil types, the Maijuna also identify a type of soil that they call **ɨna bo**. It is unclear what **ɨna** means exactly in this instance yet **bo** can be literally translated as 'white'. According to consultants, **ɨna bo** is a very fine white sand. Unfortunately, this soil was not observed due to the fact that it is very rare in Sucusari and only located far upriver from where the Maijuna currently live. Interestingly, several consultants stated that there are only one or two places in Sucusari where **ɨna bo** is found and was previously collected.

According to consultants, Maijuna men used to mix **ɨna bo** with water to paint their ear disks (**ajo tɨca**) white. Traditionally, all Maijuna men wore ear disks that were made from balsa wood (**yibi ñi**), *Ochroma pyramidale* (Cav. ex Lam.) Urb., and adorned with a black seed, from the palm *A. murumuru* Mart., in the center (Bellier 1993a, 1994). According to Bellier (1993a, 1994), these ear disks symbolized for the Maijuna their identification with the moon which is the incarnation of their cultural hero **Maineno**. Large ear disks ultimately symbolized the full moon. Maijuna women did not wear ear disks, only men were the bearers of this symbol and identity (Bellier 1993a, 1994). It is also important to note that Bellier (1993a: 272) briefly mentions that Maijuna ear disks were "polished with clay", potentially a vague reference to their use of **ɨna bo**. It is interesting that she describes the soil used as clay when in fact the vast majority of consultants interviewed during this study stated that it is a type of fine sand.

Comparisons with other indigenous habitat classification systems:

Shepard et al. (2001), in their paper describing the habitat classification system of the Matsigenka of the Peruvian Amazon, compare the habitat classification systems of several indigenous groups throughout Amazonia and identify several common characteristics and patterns that exist among these systems. In addition to the Matsigenka habitat classification system, they specifically considered various aspects of the habitat classification systems of the Kuikuru (Carneiro 1978), Kayapó (Parker et al. 1983), Káapor (Balée 1994), and Banina (Andrello 1998) of Brazil, the Yekuana (Parker et al. 1983) of Venezuela, and the Matses of Peru (Fleck 1997; Fleck and Harder 2000). Shepard et al. (2001) detail the following seven characteristics or patterns that they consider to be common in the above mentioned classification systems: (1) biotic and abiotic features are considered independently; (2) a small number of

general categories are identified based on abiotic features (i.e. topography, flooding, soils, etc.); (3) the dichotomy between upland and floodplain forest is present in all systems; (4) the dichotomy between primary and secondary forest is also found in all systems; (5) swamps, mountains, savannas, etc. may be identified as higher-order categories depending on the area; (6) biotic features (mostly indicator plant species, with palms being especially important) are used to identify specific habitats within general abiotic categories; and (7) habitats defined by overall forest architecture (i.e. liana forests, low-canopy forest, etc.) are also sometimes important.

When considering the habitat classification system of the Maijuna described throughout this chapter it is evident that their habitat classification system also fits into the above mentioned seven characteristics or patterns identified and described by Shepard et al. (2001). For example, the Maijuna recognize a dichotomy between upland and floodplain forest and they also distinguish between primary and secondary forest (even though secondary forest is an unnamed category). Additionally, a large number of palm species are used by the Maijuna to identify a variety of biotically or vegetatively defined habitats and they also recognize two different habitats defined by physiognomy. Although there are many general characteristics that are shared among the different indigenous habitat classification systems mentioned above, there are also specific differences that exist which may be due to cultural differences and/or ecological differences among the areas (Shepard et al. 2001). For instance, all of the vegetatively defined habitats identified by the Matses (Fleck and Harder 2000) are not identified by the Matsigenka (Shepard et al. 2001) and vice versa. Yet, as Shepard et al. (2001: 32) state, "…(there is) an overall pattern of extraordinary concordance between habitat classification by culturally distinct and geographically separate groups." Even though no two indigenous classification systems may be identical, many of the same specific habitats (i.e. geomorphologically and vegetatively

defined habitats, etc.) are sometimes recognized by different groups. For example, the Maijuna, Matses (Fleck and Harder 2000), and Matsigenka (Shepard et al. 2001) all recognize habitats dominated by the palms *P. macrocarpa*, *E. precatoria*, *O. bataua*, and *M. flexuosa*, respectively, among others.

The current state of Maijuna ethnoecological knowledge:

Like other Amazonian indigenous groups the present day Maijuna have been influenced and changed over the years by missionaries, the *patrón* system, the Peruvian Government, mestizos, the regional society, and the formal education system, among other things (Bellier 1993a, 1994). In addition, the Maijuna have also intermarried to a certain degree with mestizos and other neighboring indigenous groups (Bellier 1994; Gilmore pers. obs.). For these reasons, many Maijuna traditions and cultural practices are no longer practiced by the Maijuna of Sucusari or have been significantly altered. Consequently, most Maijuna children do not currently speak or understand the Maijuna language; instead they use the Spanish language. Unfortunately, this creates communication gaps between Maijuna elders and younger Maijuna individuals, ultimately limiting the exchange of important cultural information. In short, the erosion of language proficiency among Maijuna children, along with other changes within Maijuna society, is currently fueling the degradation and loss of traditional knowledge in general, and biological and ecological knowledge specifically. For instance, most Maijuna individuals under the age of approximately 30 years old do not have extensive knowledge or understanding of the Maijuna habitat classification system, and its associated traditional knowledge. Due to this fact, all of the above mentioned information regarding the Maijuna habitat classification system had to be obtained by interviewing older Maijuna individuals and

elders. Unfortunately, if the current trend continues Maijuna traditional knowledge will be but a shell of its former self in the not too distant future.

Conclusions

The Maijuna of Sucusari have an extensive and complex habitat classification system for their titled and traditional lands, an area covering tens of thousands of hectares of Amazonian rain forest. This habitat classification system provides an additional contribution and perspective regarding habitat diversity at a local scale within both upland and floodplain forests. Understanding habitat diversity within upland forests is particularly relevant considering the fact that they account for 88 percent of all lowland forests within the Peruvian Amazon (Salo et al. 1986; Räsänen et al. 1993; as cited in Vormisto 2002:1027) and the distribution and abundance of plants within these areas is poorly known and understood (Vormisto 2002). In addition to simply documenting the Maijuna habitat classification system, this study also attempted to examine and explore the use, significance, and importance of the different habitat types, and their associated resources, to the Maijuna. All Maijuna habitat types are not of equal importance; some are culturally important and useful while others are not and some can be considered "resource islands" while others are "avoidance islands". Understanding the significance and importance of habitat types identified by indigenous peoples is critical in understanding how they ultimately perceive and interact with these areas. This information is also essential in establishing culturally relevant conservation plans in that it allows conservation practitioners to focus on those habitats that are more culturally significant, useful, and important. For example, targeting "resource islands" for conservation and management seems especially appropriate.

The study of indigenous resource use, perception, and management is at a critical stage. Throughout Amazonia indigenous peoples are being subjected to ever-increasing outside influences and pressures from a variety of sources, including, but not limited to, regional societies, national governments, westernization, and missionaries. As this takes place, ethnoecological and ethnobiological knowledge is often modified to meet new demands and situations (Salick and Lundberg 1990). In addition, as new possibilities are offered to these groups, younger generations are often unwilling or unable to learn traditional resource uses and strategies resulting in the disintegration and eventual loss of ethnoecological and ethnobiological knowledge. It is imperative to understand how indigenous peoples use, perceive, and manage their resources before this knowledge is modified or lost, so it can be utilized for ecological applications, sustainable development, and ultimately in the protection of these cultures (Prance 1995). Most importantly, understanding and documenting this knowledge can also provide meaningful long-term benefits to indigenous groups. For example, documenting traditional ecological and biological knowledge can provide indigenous groups with a permanent record of this knowledge for their descendants.

Notes

[1] This population estimate does not include those Maijuna potentially living in mestizo communities, other indigenous communities, or in Iquitos, Peru (Bellier 1994).

[2] Vásquez-Martínez (1997) classifies the Sucusari as either a "black water" river or a "mixed water" river in parts yet it is difficult to determine exactly what type of river he considers the Sucusari River. For example, when defining the term igapó he states, "Forest located in the shores of "black" and/or "mixed" water rivers like the Nanay River and partly the Sucusari Stream" (Vásquez-Martínez 1997: 4).

[3] Daniel Velie produced a practical orthography for Maijuna while working for the Summer Institute of Linguistics (currently known as SIL International) from 1958 until his premature death in 1979 (V. Velie pers. comm.). The practical orthography developed by Velie (1981) consists of 27 letters that are pronounced as if reading Spanish, with the following exceptions: in a position between two vowels **d** is pronounced like the Spanish **r**; **ɨ** is pronounced like the Spanish u but without rounding or puckering the lips; and **a̱**, **e̱**, **i̱**, **o̱**, **u̱**, and **ɨ̱** are pronounced like **a**, **e**, **i**, **o**, **u**, and **ɨ** but nasalized. Also, the presence of an accent indicates an elevated tone of the voice; accents are only used when the tone is the only difference between two Maijuna words and the words meaning is not clarified by the context that it is found in. The 27 letters that make up the Maijuna alphabet are: **a, a̱, b, c, ch, d, e, e̱, g, h, i, i̱, j, m, n, ñ, o, o̱, p, q, s, t, u, u̱, y, ɨ, ɨ̱.**

[4] It is important to note that Irene Bellier also produced a practical orthography for the Maijuna language to facilitate her anthropological research and this orthography has been used throughout

two ethnographies that she has published about the Maijuna (Bellier 1993a, 1993b, 1994). I have chosen to use the orthography produced by Velie (1981), even though it may be imperfect or incomplete (Bellier 1993a, 1994), for a number of reasons. First, all Maijuna pedagogical materials (i.e. the primers, dictionary, etc.) previously published and potentially available for use in Maijuna schools utilize the practical orthography produced by Velie. Also, all Maijuna individuals literate in the Maijuna language know and use the orthographic system developed by Velie because this is the system that was taught in Maijuna schools. Due to these facts, any potential language preservation or revitalization efforts initiated by the Maijuna will, out of necessity and practicality, have to be based on Velie's practical orthography. Taking this into consideration, I have chosen to use Velie's orthography throughout this paper so that the results are accessible and potentially useful to the Maijuna themselves.

[5] This Maijuna word is written using the practical orthography developed by Bellier (1993a, 1994). The orthography developed by Bellier (1993a, 1994) differs with Velie's orthography (see note #3) in several ways as detailed by Bellier herself. First, Bellier replaced several of Velie's letters and letter combinations as follows: the **c** and **qu** with **k**, **j** with **h**, **ch** with **š** and **č**, and **gu** with **g**. In addition, Bellier also uses the symbol ~ over a letter (i.e. **õ**, etc.) to designate a nasalized sound instead of underlining the letter as did Velie (i.e. **o̲**, etc.); nasalized verbs and diphthongs are only designated or written when their nasal character is not determined by their proximity to a nasalized consonant. Bellier also reintroduced the **r** which is written as **d** in Velie's orthography; as Bellier states, the **r** alternates with **n** and **d** and the replacement is made in an inter-syllabic context. In total the system of transcription utilized by Bellier (1993a, 1994) consists of the following letters: **a, b, č, d, e, g, h, i, k, m, n, ñ, o, p, r, s, š, t, u, y, ɨ** (this list of

letters does not include those letters that may be nasalized). It is also important to note, that Bellier (1994) states that there is a system of three tones within the Maijuna language but unfortunately she does not explain this system.

[6] Authority names for those species listed in Table 4-11 are not provided in the text considering that they are indicated in the table. Authority names are provided in the text for all plant species not included in Table 4-11.

[7] According to Bellier (1993b), the word *minga* is of Quichua origin and this system of work was introduced to the Maijuna through contact with mestizo and Quichua speaking peoples from the Napo River.

Table 2-1. Terrestrial habitats defined by geomorphology by the Maijuna of Sucusari, Loreto, Peru.

Upland Forest Habitats:

Maijuna name	Maijuna translation	Local name	Description
ɨmɨ tɨ̱tɨ, **ɨmɨ coti**	'high hill', 'high plane'	altura	General term for upland forest. Also, any area in upland forest that is not classified as a more specific habitat.
ɨmɨ tɨ̱tɨ, **ɨmɨ coti**	'high hill', 'high plane'	loma, cerro	Hill in upland forest. Hills in upland forest are further classified into small hills (**yadi ɨmɨ tɨ̱tɨ** or **yadi ɨmɨ coti)** and large hills **(jai ɨmɨ tɨ̱tɨ** or **jai ɨmɨ coti)**.
ɨmɨ tɨ̱tɨ dajebɨ, **ɨmɨ coti dajebɨ**	'slope of a high hill', 'slope of a high plane'	bajada de una loma	Hill slope in upland forest.
ɨmɨ tɨ̱tɨ daje yodo, **ɨmɨ coti daje yodo**	'channel in a slope of a high hill', 'channel in a slope of a high plane'	canal, zanja	Drainage channel in upland forest that collects water from the surrounding hills when it rains. Ephemeral headwaters of streams.
cuadubɨ	'place of soft earth'	chavascal	Swamp found in poorly drained upland forest. These areas are generally small in size and are not suitable for agriculture. In addition to this type of swamp, the Maijuna name and classify other types of swamps based on indicator plant species or plant life forms (see Table 3).

Floodplain Forest Habitats:

Maijuna name	Maijuna translation	Local name	Description
yiaya coti	'river's/stream's plane'	bajial	General term for floodplain forest. Also, any area in floodplain forest that is not classified as a more specific habitat. Floodplain forest is further subdivided into three types based on river size: **yadiya coti** ('small stream's plane')**, jaicuya coti** ('medium river's plane')**,** and **jaiya coti** ('large river's plane').
cuedaca	'flood of liquid'	tahuampa	Name given to floodplain forest (**yiaya coti**) when it is seasonally inundated for several months at normal levels. Flooding is characterized as **cuedaca** when it does not cover levee islands.

Maijuna name	Maijuna translation	Local name	Description
jai cuedaca	'large flood of liquid'	tahuampa grande	Name given to floodplain forest (**yiaya coti**) when it is seasonally inundated at abnormally high levels. Flooding is characterized as **jai cuedaca** when it covers levee islands. This occurs infrequently along the Sucusari River.
oco cuedaca, **oco minijo daca**	'flood of liquid from rain', 'full of liquid from rain'	tahuampa de lluvia, creciente de lluvia	Name given to floodplain forest (**yiaya coti**) when it is temporarily inundated for short periods of time due to heavy rains. This occurs along small streams and medium sized rivers.
yiaya coti tɨtɨ, **cuedaca tɨtɨ**	'hill in a river's plane', 'hill in a flood of liquid'	restinga	Levee island. Levee islands are surrounded by water when floodplain forest is flooded. Levee islands are only covered with water during times of j**ai cuedaca**.
yiaya unu	'river/stream bank' or 'edge of a river/stream'	orilla del río/quebrada, canto del río/quebrada	The bank and/or edge of a river/stream. **Yiaya unu** is further subdivided into three types based on river size: **yadiya unu** ('bank/edge of a small stream')**, jaicuya unu** ('bank/edge of a medium river')**,** and **jaiya unu** ('bank/edge of a large river').
chitada unu	'bank/edge of a lake'	orilla de la cocha, canto de la cocha	The bank and/or edge of a lake found in floodplain forest. **Chitada unu** is further subdivided into two types based on lake size: **yadi chitada unu** ('bank/edge of a small lake') and **jai chitada unu** ('bank/edge of a large lake').
cuadubɨ	'place of soft earth'	chavascal	Swamp found in floodplain forest. These areas are generally small in size and are not suitable for agriculture. In addition to this type of swamp, the Maijuna name and classify other types of swamps based on indicator plant species or plant life forms (see Table 3).

Table 2-2. Forest habitats defined by physiognomy by the Maijuna of Sucusari, Loreto, Peru.

Maijuna name	Maijuna translation	Local name	Description
aquibi	'place with ugly forest'	feal	Low growing, very dense thickets that have a high concentration of creeping vines and thorny plants. Found in floodplain forest along river margins. Vision and mobility are extremely limited in these areas and therefore they are generally avoided. The Maijuna name and classify other types of 'ugly forest' based on indicator plant species or plant life forms (see Table 5).
deo dadi, **deo bese**	'good place', 'good clarity'		Forest with a very open understory. Vision and mobility are not limited in these areas. Found in both upland and floodplain forest.

Table 2-3. Forest habitats defined by indicator plant species or plant life forms and located in areas with 'soft earth' (**cuadu)**. These areas are not suitable for agriculture. Habitats recognized and classified by the Maijuna of Sucusari, Loreto, Peru.

Maijuna name	**Maijuna translation**	**Local name**	**Description**
ne cuadu	'*Mauritia flexuosa* in soft earth'	aguajal	Swamp dominated by the palm tree *M. flexuosa*. Found in both floodplain and poorly drained upland forest. Important hunting and collecting areas when *M. flexuosa* is in fruit.
~~i~~mi~~i~~bi cuadu, ~~i~~mi~~i~~bi~~e~~ cuadu	'*Euterpe precatoria* in soft earth'	huasaial, chontal	Swamp dominated by the palm tree *E. precatoria*. Found in poorly drained upland forest. Rare in Sucusari due to the felling of this tree to sell its palm heart.
bosa cuadu, osa cuadu	'*Oenocarpus bataua* in soft earth'	hungarahual, ungarahual	Swamp dominated by the palm tree *O. bataua*. Found in poorly drained upland forest and usually small in size.
bi cuadu	'*Bactris concinna* in soft earth'	chontillal	Swamp with small, dense stands of the understory palm *B. concinna*. Found in floodplain and poorly drained upland forest. The Maijuna generally do not enter these areas.
adu cuadu, mio cuadu	'*Bactris bifida* in soft earth'	espinal	Swampy area with an understory dominated by the palm *B. bifida*. Found in floodplain and poorly drained upland forest. This habitat is usually small in size and is generally avoided.
ji~~i~~co cuadu	'*Socratea exorrhiza* in soft earth'	cashaponal	Swamp dominated by the palm tree *S. exorrhiza*. According to consultants, this habitat is found in poorly drained upland forest and is usually small in size. Rare in Sucusari.
chida cuadu	'*Astrocaryum murumuru* in soft earth'	huicungal	Semi-swampy area dominated by the palm *A. murumuru*. Found in floodplain forest. Rare in Sucusari.
mio cuadu	'spines in soft earth'	espinal	Swamp dominated by a variety of spiny plants (i.e. *Bactris* spp., *Mimosa myriadenia*, etc.). Found in poorly drained upland forest and, according to consultants, floodplain forest. This habitat is generally avoided.
~~s~~inodei cuadu	'*Carludovica palmata* in soft earth'	bombonajal	Swampy area with an understory dominated by the plant *C. palmata*. Found in poorly drained upland forest and generally small in size. May be a seral habitat (see text for discussion). Rare in Sucusari.

Maijuna name	Maijuna translation	Local name	Description
noca cuadu	'*Asplundia* sp. in soft earth'		Swampy area with an understory dominated by the plant *Asplundia* sp. Found in floodplain and poorly drained upland forest. Usually small in size.
cudu cuadu	'*Virola* spp. in soft earth'		Swamp with a stand of *Virola* spp. trees. These areas also generally have high concentrations of the palm *M. flexuosa* which may in fact be dominant. Rare in Sucusari due to logging.
maja cuadu	'*Symphonia globulifera* in soft earth'		Swamp with a diffuse stand of the tree *S. globulifera*. These areas also generally have high concentrations of the palm *M. flexuosa* which may in fact be dominant. Rare in Sucusari.
abio cuadu, abi cuadu	'*Cyathea pungens* in soft earth'		Swamp with an understory dominated by the fern *C. pungens*. The overstory of these areas is usually dominated by *M. flexuosa*. Found in poorly drained upland forest.
bijao cuadu, nuta jao cuadu	'*Calathea lutea* in soft earth'		Swamp with an understory dominated by *C. lutea*. The overstory of these areas is usually dominated by *M. flexuosa*. According to consultants, this habitat is found in floodplain and poorly drained upland forest. Rare in Sucusari.

Table 2-4. Forest habitats defined by indicator plant species or plant life forms and located in areas with 'ugly forest' (**aqui**). Habitats recognized and classified by the Maijuna of Sucusari, Loreto, Peru.

Maijuna name	Maijuna translation	Local name	Description
jeo aga aqui	'ugly forest of *Uncaria guianensis* and/or *Uncaria tomentosa*'	feal	Low growing, very dense thorny thicket that is dominated by *U. guianensis* and/or *U. tomentosa*. Found in floodplain forest along river margins. This habitat is generally avoided.
bibi aqui	'ugly forest of *Ischnosiphon puberulus*'	feal	Low growing, dense forest that is dominated by the vine *I. puberulus*. Found in floodplain forest. This habitat is generally avoided.
bichi aqui	'ugly forest of vines'	sogal	Liana forest. Dense forest that is dominated by a variety of woody vines. Found in floodplain forest. This habitat is generally avoided.
mio aqui, mio siguidi	'ugly forest of *Mimosa myriadenia var. dispersa* or *Mimosa myriadenia* var. *punctulata*', '*M. myriadenia* var. *dispersa*' or '*M. myriadenia* var. *punctulata*'	pashaquillal	Low growing, very dense thorny thicket. Dominated by *M. myriadenia* var. *dispersa* when located in floodplain forest along river margins and *M. myriadenia* var. *punctulata* when located in old swiddens. This habitat is generally avoided.

Table 2-5. Forest habitats defined by indicator plant species or plant parts and located in areas that do not have 'soft earth' or 'ugly forest'. Habitats recognized and classified by the Maijuna of Sucusari, Loreto, Peru.

Maijuna name	Maijuna translation	Local name	Description
bosa nui nɨcadadi, osa nui nɨcadadi	'place where there is a lot of *Oenocarpus bataua*'	hungarahual, ungarahual	Forest dominated by the palm *O. bataua*. Found on hill crests and hill plateaus in upland forest.
jɨ̱co nui nɨcadadi	'place where there is a lot of *Socratea exorrhiza*'	cashaponal	Forest with small to medium sized stands of the palm *S. exorrhiza* surrounded by low growing dense vegetation. Found in floodplain forest along river margins.
bi nui nɨcadadi	'place where there is a lot of *Bactris macroacantha*'	chontillal	Successional forest with an understory dominated by *B. macroacantha*. Found in old swiddens.
chida nui nɨcadadi	'place where there is a lot of *Astrocaryum murumuru*'	huicungal	Floodplain forest dominated by the palm *A. murumuru*.
mɨ̱ibɨ, mɨ̱i nui nɨcadadi	'place of *Lepidocaryum tenue*', 'place where there is a lot of *Lepidocaryum tenue*'	irapayal	Upland forest with an understory dominated by the palm *L. tenue*. Important thatch collecting areas year round.
mɨ̱ibɨ, mɨ̱i nui nɨcadadi	'place of *Phytelephas macrocarpa*', 'place where there is a lot of *Phytelephas macrocarpa*'	yarinal	Upland forest with an understory dominated by the palm *P. macrocarpa*. **Nea yao** ('black earth') is a characteristic feature of **mɨ̱ibɨ** and this habitat is considered the best area for clearing agricultural fields.
tɨ̱tɨ̱ mɨ̱i nui nɨcadadi, tɨ̱tɨ̱ mɨ̱i coti	'place where there is a lot of *Geonoma juruana*', 'flat or level surface with *Geonoma juruana*'	palmichal, sanpabliyal	Forest with an understory dominated by the palm *G. juruana*. Found on hill crests and hill plateaus in upland forest.
edi nui nɨcadadi, edi coti	'place where there is a lot of *Attalea racemosa*', 'flat or level surface with *Attalea racemosa*'	shapajillal	Upland forest with an understory dominated by the palm *A. racemosa*.
a̱jo̱ edi nɨcadadi, edi nui nɨcadadi	'place where there is *Attalea maripa*', 'place where there is a lot of *Attalea maripa*'	contal	Upland forest with a diffuse stand of the palm *A. maripa*.

Maijuna name	Maijuna translation	Local name	Description
tatidi nui nɨcadadi, tatidi coti	'place where there is a lot of *Itaya amicorum*', 'flat or level surface with *Itaya amicorum*'		Upland forest with an understory dominated by the palm *I. amicorum*.
oda nɨcadadi, jai oda nui nɨcadadi	'place where there is *Iriartea deltoidea*', 'place where there is a lot of *Iriartea deltoidea*'	huacraponal	Upland forest with a diffuse stand of the palm *I. deltoidea*.
nini nui nɨcadadi	'place where there is a lot of *Geonoma macrostachys* var. *acaulis*'		Floodplain forest with an understory dominated by the palm *G. macrostachys* var. *acaulis*.
bea jao nui nɨcadadi	'place where there is a lot of *Cyclanthus* sp.'		Successional forest with a diffuse stand of the understory plant *Cyclanthus* sp. Found in old swiddens in upland areas.
mañaco taco	'open area with *Duroia hirsuta*'	supay chacra	Upland forest dominated by *D. hirsuta* with a very open understory.
maquɨ nui nicadadi, maquɨ nui baidadi	'place where there is a lot of *Cecropia* spp.', 'place where a lot of *Cecropia* spp. live'	cetical	Successional forest dominated by *Cecropia* spp. Found in old swiddens, floodplain forest along river margins, and tree fall gaps.
bito nui nɨcadadi	'place where there is a lot of *Couma macrocarpa*'	leche caspal	Forest with a diffuse stand of *C. macrocarpa* trees. According to consultants, this habitat is found in upland forest. These areas were important in the past when the Maijuna collected the latex of this tree for *patrones*.
yaometo nui nɨcadadi	'place where there is a lot of *Cedrela odorata*'	cedral, manchal de cedro	Forest with a diffuse stand of *C. odorata* trees. Rare to non-existent in Sucusari due to logging.
mɨani nui nɨcadadi, mɨani nɨcacoti	'place where there is a lot of *Cedrelinga cateniformis*', 'flat surface or level surface where there is *Cedrelinga cateniformis*'		Forest with a diffuse stand of *C. cateniformis* trees. Found on hill crests and hill plateaus in upland forest. Very rare in Sucusari.
maso nui nɨcadadi, maso nui baidadi	'place where there is a lot of *Ficus insipida*', 'place where a lot of *Ficus insipida* lives'	ojeal	Upland forest with a diffuse stand of *F. insipida* trees. Located in both old swiddens and primary forest. May be a seral habitat when located in primary forest (see text for discussion).

Maijuna name	Maijuna translation	Local name	Description
bati o nui nɨcadadi	'place where there is a lot of *Heliconia standleyi*'	situllal	Forest with small stands of the understory plant *H. standleyi*.
maca bichi nui nɨcadadi	'place where there is a lot of *Ananas ananassoides*'	sacha piñal	Upland forest with dense stands of the understory plant *A. ananassoides*. This habitat is small in size and rare in Sucusari.
mɨmɨdi nui nɨcadadi	'place where there is a lot of *Selaginella stellata*'		Successional forest with an herbaceous layer dominated by *S. stellata*. Found in old swiddens in upland areas.
mio siguidi, mio aqui	'*Mimosa myriadenia* var. *dispersa*' or '*Mimosa myriadenia* var. *punctulata*', 'ugly forest of *M. myriadenia var. dispersa* or *M. myriadenia* var. *punctulata*'	pashaquillal	See Table 4.
ñaji coti	'flat or level surface with soil covererd by a lot of small roots'		Upland forest with soil that is covered by a relatively thick mat of fine roots. According to the Maijuna, these areas are not suitable for agriculture.

Table 2-6. Disturbed habitats (either human induced or natural) recognized by the Maijuna of Sucusari, Loreto, Peru. Successional habitats that are identified by indicator plant species are not included (see Tables 3, 4, and 5).

Maijuna name	**Maijuna translation**	**Local name**	**Description**
yio	'swidden'	chacra	General term for swidden field. The vast majority of swiddens in Sucusari are cleared in upland forest.
aiyio, **doe yio**	'old swidden', 'previous swidden'	purma, chacra vieja	Recently fallowed swidden containing immature secondary forest. Fruits and some agricultural produce from a variety of species are collected from these areas.
ine yio	'*Bactris gasipaes* swidden'	pijuayal	Swidden fallow dominated by *Bactris gasipaes*.
ai bese yio, **doe bese yio**	'ancient or old swidden', 'ancient previous swidden'	purma antigua	Very old swidden fallow that contains mature secondary forest. These areas are identified based on memory, oral history, characteristic plant species, etc.
ue taco	'open area with a house'	patio de la casa	Occupied house site. Cleared areas around houses that generally contain a variety of useful, cultivated plants.
ai taco, **doe taco**	'old open area', 'previously open area'	puesto viejo	Recently abandoned house site. These areas contain immature secondary vegetation that is comprised of weeds and/or small sized trees. These areas are identified based on memory, characteristic plant species, and the fact that the general form of the house site is still visible.
ai bese taco, **doe bese taco**	'ancient or old open area', 'ancient previously open area'	puesto viejo	Very old house site that has been abandoned for extensive periods of time. These areas contain mature secondary forests that are made up of large sized trees. These areas are identified based on memory, oral history, the presence of pottery shards, characteristic plant species, etc.
jaiya vaca taco	'open area with cattle'	pasto	Pasture for raising cattle and/or water buffalo. There is a small pasture that has recently been cleared in Sucusari to raise a few communally owned cows for sale (not raised for consumption). Large pastures are found in communities along the Napo River.
mai tate taco	'open area to sow people'	cementerio	Cemetery. Only found in upland areas.

Maijuna name	Maijuna translation	Local name	Description
tutu badu yio	'ugly place that is a field of the wind'	chacra del viento, árbol caído por el viento	Natural tree fall gap. According to consultants, before the advent of metal axes and machetes Maijuna ancestors would use these natural gaps in the forest to plant their fields in.
cuese badu	'ugly place that was cut down'	palo/árbol cortado	Human induced tree fall gap. C**uese badu** are created when trees are felled for canoe construction, selective logging, the harvesting of fruits and honey, etc.

Table 2-7. Habitats defined by indicator animal species by the Maijuna of Sucusari, Loreto, Peru.

Maijuna name	Maijuna translation	Local name	Description
tuada, onobi	'animal mineral lick', 'place of *Manihot esculenta* beer'	colpa	Animal mineral lick. Found in both floodplain and poorly drained upland forest. Important hunting areas year round.
bai baidadi	'place where animals live'		Forest with a high concentration of game animals. According to consultants, this habitat is found in both floodplain and upland forest.
naso baidadi	'place where *Lagothrix lagothricha* lives'		Forest with a high concentration or large population of common woolly monkeys (*Lagothrix lagothricha*). According to consultants, this habitat is found in both floodplain and upland forest.
meniyo baidadi	'place where **meniyo** (an unidentified turtle species) lives'		Forest with a high concentration or large population of an unidentified turtle species. According to consultants, this habitat is found in swamps in both floodplain and poorly drained upland forest.
caocoa abida, caocoa abidadi	'liquid where *Tayassu tajacu* bathes', 'place where *Tayassu tajacu* bathes'	bañero de sajino	*Tayassu tajacu* (collared peccary) mud wallow. Commonly found at the base of overturned trees. Rare in Sucusari and found in both floodplain and upland forest.
mucu baidadi, mucu taco	'place where **mucu** (an unidentified species of biting ant) lives', 'open area with **mucu** (an unidentified species of biting ant)'	ichichimal	Forest with a high concentration or large population of an unidentified species of biting ants. Found in both primary forest and old swiddens.
jaiqui baidadi	'place where **jaiqui** (an unidentified species of stinging ant) lives'	pucacural	Forest with a high concentration or large population of an unidentified species of stinging ants. Found in both primary forest and old swiddens.
meca baidadi, meca titi	'place where **meca** (an unidentified species of leaf cutter ant) lives', '**meca** (an unidentified species of leaf cutter ant) hills'	curuhuinsal	Forest containing a leaf cutter ant's nest and therefore a high concentration of leaf cutter ants. Found in both primary forest and old swiddens. Leaf cutter ant's nests are only found in upland forest yet their trails may be found in both upland and floodplain forest (when not flooded).

Table 2-8. Animals and birds that are encountered and killed by the Maijuna in animal mineral licks (**tuada** or **onobɨ**) within the Sucusari River Basin.

Taxon	English name	Maijuna name	Local name	Time encounter (day/night)	Use
Agoutidae					
Agouti paca	paca	**seme, oje beco, pɨbɨ aco**	majaz	night	eat, sell (meat), tourist crafts (teeth)
Cebidae					
Alouatta seniculus	red howler monkey	**jaiquɨ**	coto mono	day	eat, sell (meat), tourist crafts (bony pouch or hyoid bone from throat)
Cervidae					
Mazama americana	red brocket deer	**bosa, mɨibɨ aquɨ**	venado colorado	night, day (rarely)	eat, sell (meat), medicinal (antlers), adornment of houses (antlers), used to make drums (hide)[a]
Cracidae					
Pipile cumanensis	blue-throated piping-guan	**uje**	pava	day	eat, sell (meat), used to make fans for fires (feathers), adornment (make "paint" from legs)
Dasyproctidae					
Dasyprocta fuliginosa	black agouti	**maitaco, moñeteaco, codome**	añuje	day	eat, sell (meat), tourist crafts (teeth)
Erethizontidae					
Coendou prehensilis	Brazilian porcupine	**toto**	cashacuchillo	night	eat, tourist crafts (spines)
Tapiridae					
Tapirus terrestris	Brazilian tapir	**bequɨ, jaico**	sacha vaca	night	eat, sell (meat), medicinal (hooves), tourist crafts (hooves)
Tayassuidae					
Tayassu pecari	white-lipped peccary	**sese, bɨdɨ**	huangana	day	eat, sell (meat and hide), tourist crafts (teeth), used to make drums (hide)[a]
Tayassu tajacu	collared peccary	**caocoa, yau**	sajino	day	eat, sell (meat and hide), tourist crafts (teeth), used to make drums (hide)[a]

[a] Not currently used in this way by the Maijuna of Sucusari.

Table 2-9. Aquatic habitats, and their respective parts, recognized by the Maijuna of Sucusari, Loreto, Peru.

Maijuna name	**Maijuna translation**	**Local name**	**Description**
yiaya	'river/stream'	río, quebrada	General term for a river or stream. Rivers and streams are further subdivided into three types based on size: **yadiya** ('small stream'), **jaicuya** ('medium river'), and **jaiya** ('large river').
yiaya sado	'mouth of a river/stream'	boca del río/quebrada	Mouth of a river or stream.
yiaya sani	'headwaters of a river/stream'	cabecera del río/quebrada	Headwaters of a river or stream.
doaya	'long part of a river/stream'	estirón del río/quebrada	Straight segment of a river between bends or curves.
yiaya tego	'turn or curve of a river/stream'	vuelta del río/quebrada, curva del río/quebrada	Bend in a river or stream. These areas may or may not have **yiada**.
yiada	'deep pool'	pozo del río	Deep pools that are found in some river bends. **Yiada** are further subdivided into two types based on size: **yadi yiada** ('small deep pool') and **jai yiada** ('large deep pool').
yiaya jeo ma dadi	'place in a river/stream that does not flow'	remanso	Part of a river or stream that is stagnant or very slow moving in comparison to other parts due to an obstruction or because it is sheltered. Generally found along the edge of rivers or steams.
yiaya unu	'river/stream bank' or 'edge of a river/stream'	orilla del río/quebrada, canto del río/quebrada	See Table 1.
chitada	'lake'	cocha	General term for a lake. Lakes are found in floodplain forest and are characterized by the presence of **nea daca** ('black water'). Lakes are further subdivided into two types based on size: **yadi chitada** ('small lake') and **jai chitada** ('large lake').
chitada unu	'bank/edge of a lake'	orilla de la cocha, canto de la cocha	See Table 1.

Table 2-10. Types of soils classified by the Maijuna of Sucusari, Loreto, Peru.

Maijuna name	Maijuna translation	Local name	Description
yao	'earth'	tierra	General term for earth or soil. Also, any type of soil that is not classified as a more specific type.
nea yao	'black earth'	tierra negra	Soil that is black in color. Found on land and along exposed river banks. **Nea yao** that is found in **mɨjbɨ** (forest dominated by the understory palm *P. macrocarpa*) is the preferred soil for agriculture.
ma yao	'red earth'	tierra colorada	Soil that is red in color. Found on land and along exposed river banks. **S**uitable for agriculture when on land. **Ma yao** that is found along exposed river banks generally has a high clay content and was previously used to paint ceramics red.
sɨño yao	'yellow earth'	tierra amarilla	Soil that is yellow in color. According to consultants, **sɨño yao** is generally only found along exposed river banks. Has a high clay content and was previously used to paint ceramics yellow.
bo yao	'white earth'	tierra blanca	Soil that is white in color. According to consultants, **bo yao** is generally only found along exposed river banks. Has a high clay content and was previously used to paint ceramics white.
meja yao	'sandy earth'	tierra arenosa	Sandy soil (i.e. sandy loam, sandy clay loam, or sandy clay). **S**uitable for agriculture.
ata yao	'earth with small stones'		Soil that contains small stones or pebbles. Not suitable for agriculture.
toto	'clay'	greda	Gray colored clay that is found along exposed river banks. Used in the production of ceramics.
meja	'sand'	arena	Pure sand. Exposed beaches or fluvial bars of large rivers (i.e. the Amazon and Napo Rivers) are composed of **meja**. Not found along the Sucusari River.
ɨna bo	fine white sand		Described by consultants as a very fine white sand. Previously mixed with water and used by Maijuna men to paint their ear disks (**ajo tɨca**) white.

Table 2-11. Ethnobotanical information corresponding to the plants that vegetatively defined habitats types are named after by the Maijuna of Sucusari, Loreto, Peru (see Tables 3, 4, 5, & 6 for corresponding habitats).

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
Apocynaceae					
Couma macrocarpa Barb. Rodr. [392, 515]	**bito ñi** ('resin tree')	leche caspi	fruits: edible	fell	~February-June
			latex: medicinal (diarrhea)	tap	year round
			latex: used to seal/caulk canoes, etc.	fell, tap	year round
			latex: collected for *patrones* and sold to make chewing gum[c]	fell, tap	year round
			latex: used to "clothe" babies[c]	tap	year round
Arecaceae					
Astrocaryum murumuru Mart. [556]	**chida ñi**	huicungo	fruits: edible (liquid/spongy endosperm)	fell	?
			sprouting seeds: medicinal oil (pimples)	from ground	year round
			trunk: construction material house and floor support posts	fell	year round
			trunk: pry bars for canoe construction	fell	year round
			seeds: seed coat used to adorn ear disks[c]	on ground	year round
			spear leaf: immature leaflets used to make "crowns" and "flags" for traditional ritual associated with *B. gasipaes*[c]	not felled (harvested from small plants)	~January-February (time of ritual)
Attalea racemosa Spruce [594]	**edi sa, chieco edi sa**	shapajilla	fruits: older fruits host a beetle larvae that is eaten and used as fishing bait	on ground	year round
			leaves: thatch for temporary shelters and the ridges of roofs	not felled	year round
			seeds: edible	on ground, pick	year round
			seeds: used to smooth and/or polish clay during the production of ceramics	on ground, pick	year round

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
Attalea maripa (Aubl.) Mart. [628]	**ajo edi ñi, edi ñi**	conta	fruits: older fruits host a beetle larvae that is eaten and used as fishing bait	on ground	year round
			fruits & seeds: edible	on ground, fell, climb leaning pole	year round
			peduncular bract: used as a dish to store things and as a child's toy canoe	on ground	year round
			seeds: used to smooth and/or polish clay during the production of ceramics	on ground	year round
Bactris gasipaes Kunth [332, 604]	**ine ñi**	pijuayo	fruits & seeds: edible fruits eaten cooked and processed into a fermented beverage, a type of soup, and an oil; fruits occasionally sold	with pole from ground or from adjacent tree, fell (when very tall)	~January-May and July-September
			fruits & seeds: used as animal feed	same as above	same as above
			fruits: processed into fishing bait	same as above	same as above
			fruiting cycle: used to help keep track of the seasons and to calculate time on a yearly basis (still practiced by some elders)	N/A	N/A
			trunk: used to make clubs and the shafts of blowguns[c]	fell	year round
Bactris bifida Mart. [446, 583]	**adu ñi, mio ñi** ('spine tree')		not used	N/A	N/A
Bactris concinna Mart. [632]	**bi ñi**	chontilla	fruits: edible	pick, fell	year round
			stems: used to make fishing spears	fell	year round
			stems: used to make the frames of sieves	fell	year round

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
Bactris macroacantha Mart. [624]	**bi ñi**	chontilla	fruits: edible	pick, fell	year round
			stems: used to make fishing spears	fell	year round
			stems: used to make the frames of sieves	fell	year round
Euterpe precatoria Mart. [313, 531]	**ɨmɨbi ñi, ɨmɨbɨe ñi**	huasai, chonta	fruits: used to make a beverage	fell	year round
			leaves: thatch for temporary shelters	fell, not felled	year round
			palm heart: edible; occasionally sold	fell	year round
			roots: processed into a medicine (malaria)	from ground (not felled)	year round
			trunk: construction material railings and walls for houses	fell	year round
			crown shaft: used to package processed blocks of *Couma macrocarpa* latex[c]	fell	year round
Geonoma macrostachys Mart. var. *acaulis* (Mart.) Skov [589, 634]	**nɨnɨ ñi**		leaves: occasionally (when abundant) placed on the ground to quarter animals while hunting in floodplain forest	not felled	year round
Geonoma juruana Dammer [464, 473, 474, 415]	**tɨtɨ mɨi ñi** ('trumpeter's *L. tenue* tree')	palmichi, sanpabliyo	leaves: thatch for houses, temporary shelters, and henhouses	not felled, fell (when tall)	year round
			leaves: thatch for traditional sleeping houses (**mɨte ue**)[c]	not felled, fell (when tall)	year round
Iriartea deltoidea Ruiz & Pav. [322[d], 539]	**oda ñi, jai oda ñi**	huacrapona	trunk: construction material floors of houses and temporary shelters; also used to construct animal corrals and henhouses	fell	year round
			leaves: thatch for temporary shelters	fell	year round
			trunk (swollen part): used to make temporary canoes and vats to hold and ferment *Manihot esculenta* beer	fell	year round

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
Itaya amicorum H.E. Moore [420, 591]	**tatidi ñi**		leaves: thatch for temporary shelters	not felled, fell	year round
Lepidocaryum tenue Mart. [414, 536]	**mii ñi**	irapay	leaves: thatch for houses this is the most popular and important plant for thatch and is occasionally sold	not felled, fell (when tall)	year round
Mauritia flexuosa L. f. [321, 529]	**ne ñi**	aguaje	fruits: edible fruits eaten, used to make a beverage, and processed into an oil; fruits occasionally sold	fell, on ground	~May-August
			fruits: pieces used as fishing bait	same as above	same as above
			leaves: use old, dry leaves as a fuel for drying canoes and starting fires in newly cleared and dried agricultural fields	cut old and hanging leaves off of tree	year round
			petioles: strips of fiber used to make mats and used as a form for weaving palm fiber bags	not felled (harvested from small plants)	year round
			trunk: hosts two species of beetle larvae that are eaten and used as fishing bait	fell to promote larval growth, also grow on natural tree falls	year round
Oenocarpus bataua Mart. [324, 555]	**bosa ñi, osa ñi**	hungurahui, ungurahui	fruits: edible fruits eaten, used to make a beverage, and processed into an oil	fell, climb	~November-March and June-August
			fruits (unripe): processed into a medicine (tuberculosis)	fell, climb	~year round
			leaves: used to make temporary baskets	not felled (harvested from small plants)	year round
			leaves: thatch for temporary shelters	fell, not felled	year round

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
			trunk: hosts a beetle larva that is eaten and used as fishing bait	fell to promote larval growth, also grow on natural tree falls	year round
			leaf base fibers: sharpened and used to pierce men's ears for ear disks[c]	not felled	year round
			leaf base fibers: used as kindling[c]	fell	year round
Phytelephas macrocarpa Ruiz & Pav. [579]	**mi̱i̱ ñi**	yarina	fruits: edible (liquid/immature endosperm)	fell, pick	year round
			leaves: thatch for temporary shelters and the ridges of roofs	fell	year round
			fruits: the hard endosperm was collected for *patrones* and sold as a source of vegetable ivory[c]	on ground	year round
Socratea exorrhiza (Mart.) H. Wendl. [315, 530]	**ji̱co ñi**	cashapona	stilt roots: spiny sections used as graters	not felled	year round
			trunk: construction material floors of houses and temporary shelters; walls of houses; slats also used to weave thatch around; occasionally sold	fell	year round
			trunk: used to make platforms above cooking fires to dry and smoke food	fell	year round
			trunk: occasionally used to make a variety of tourist crafts for sale	fell	year round
			trunk: used to make spears for hunting and warfare[c]	fell	year round
Bromeliaceae					
Ananas ananassoides (Baker) L.B. Sm. [412, 585, 630]	**maca bichi** ('forest pineapple')	sacha piña	not used	N/A	N/A

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
Cecropiaceae					
Cecropia sp.	**maqui̵ ñi**	cetico	bark: mucilage from inner bark is medicinal (abscesses/boils)	not felled	year round
			bark: used to slide canoes and boats over tree falls that block rivers	not felled	year round
Cecropia sp.	**maqui̵ ñi**	cetico	trunk: construction material house railings; also used to construct animal corrals	fell	year round
Cecropia sp.	**maqui̵ ñi**	cetico	roots: contain drinking water	from ground (not felled)	year round
Cecropia spp.	**maqui̵ ñi**	cetico	not used	N/A	N/A
Clusiaceae					
Symphonia globulifera L. f. [405, 587]	**maja ñi** (‘tar tree’)		fruits: edible	fell	~January-April
			latex: used to seal/caulk canoes, etc.	fell	year round
Cyatheaceae					
Cyathea pungens (Willd.) Domin [545]	**abio ñi, abi ñi**	yarinilla	not used	N/A	N/A
Cyclanthaceae					
Asplundia sp.	**noca**		not used	N/A	N/A
Cyclanthus sp. [433, 563]	**bea jao** (‘corn leaf’)		leaves: wrap and cook food in (i.e. fish, fruits, animal intestines, etc.)	leaves cut from essentially stemless plants	year round
			leaves: wrap and store salt in	same as above	same as above

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
Carludovica palmata Ruiz & Pav. [329, 435]	**sinodei sa**	bombonaje	leaf buds: extracted fibers used in the production of small baskets; baskets occasionally sold to tourists	leaves cut from underground stems	year round
			petioles: strips of fiber used to make a variety of crafts (i.e. baskets, sieves, etc.)	same as above	same as above
Fabaceae					
Cedrelinga cateniformis (Ducke) Ducke [257, 409, 586]	**mia ñi**	tornillo caspi, cedroline	trunk: used to make the hulls, seats, and keels of canoes	fell	year round
			trunk: very rarely selectively logged and sold	fell	year round
Mimosa myriadenia (Benth.) Benth. var. *dispersa* Barneby [633]	**mio siguidi**	pashaquilla	not used	N/A	N/A
Mimosa myriadenia (Benth.) Benth. var. *punctulata* (Spruce ex Benth.) Barneby [431, 631]	**mio siguidi**	pashaquilla	not used	N/A	N/A
Heliconiaceae					
Heliconia standleyi J.F. Macbr. [422, 629]	**bati o**	situlli	leaves: used to roof temporary shelters	fell	year round
			leaves: used as temporary "plates" or "tables" while in the forest	not felled, fell	year round
Marantaceae					
Calathea lutea Schult. [434, 533]	**nuta jao sa**	bijao	leaves: wrap and cook food in (i.e. fish, animal intestines, etc.)	leaves cut from essentially stemless plants	year round
			leaves: wrap and store salt and fariña (a coarse flour or meal made from *M. esculenta*) in	same as above	same as above
Ischnosiphon puberulus Loes. [523]	**bibi**	trompetero chaqui	not used	N/A	N/A

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
Meliaceae					
Cedrela odorata L. [107, 398[d], 575]	**yaometo ñi, yo ñi** (‘canoe tree’)	cedro	bark: processed into a medicine (diarrhea)	not felled	year round
			trunk: construction material	fell	year round
			trunk: selectively logged and sold	fell	year round
			trunk: used to make the hulls, seats, and keels of canoes	fell	year round
			trunk: used to make the frames of drums[c]	fell	year round
Moraceae					
Ficus insipida Willd. [84, 432, 568]	**maso ñi**	ojé	not used	N/A	N/A
Myristicaceae					
Virola spp.	**cudu ñi**	cumala	fruits: edible (aril) prepared by wrapping in the leaves of two plant species and heating over fire	fell	~April-June
			seeds: used as a fuel for torches	fell	~April-June
			trunk: selectively logged and sold	fell	year round
Rubiaceae					
Duroia hirsuta (Poepp.) K. Schum. [424, 537]	**mañaco ñi**	caimitillo del supay chacra	not used	N/A	N/A
Uncaria guianensis (Aubl.) J.F. Gmel. [551]	**jeo aga**	uña de gato	not used	N/A	N/A
Uncaria tomentosa (Willd. ex Roem. & Schult.) DC. [441, 552]	**jeo aga**	uña de gato	not used	N/A	N/A

Taxon [voucher][a]	Maijuna name	Local name	Use	Harvesting method	Time of harvest[b]
Selaginellaceae					
Selaginella stellata Spring [418, 572]	**mimidi**	shapumba	not used	N/A	N/A

[a] Specimens were collected by M. Gilmore (with the help of various field assistants) under permit N^{o} 71-2003-INRENA-IFFS-DCB issued by the Instituto Nacional de Recursos Naturales (INRENA), Peru. All voucher specimens are deposited in AMAZ and MU unless otherwise indicated. Preliminary identifications were made by Cesar Grández Ríos and Michael Gilmore with final determinations by Rodolfo Vásquez Martínez.

[b] Harvest times indicated in the table are based on consultant testimony and have not been independently verified by the researcher. Therefore all times (especially fruiting times) should be considered approximate and preliminary figures.

[c] Not currently used in this way by the Maijuna of Sucusari.

[d] This collection number is only deposited in AMAZ and not in MU.

Figure 2-1. Map showing the location of all four current Maijuna communities (Sucusari, Puerto Huamán, Nueva Vida, and San Pablo de Totoya), including the surrounding region.

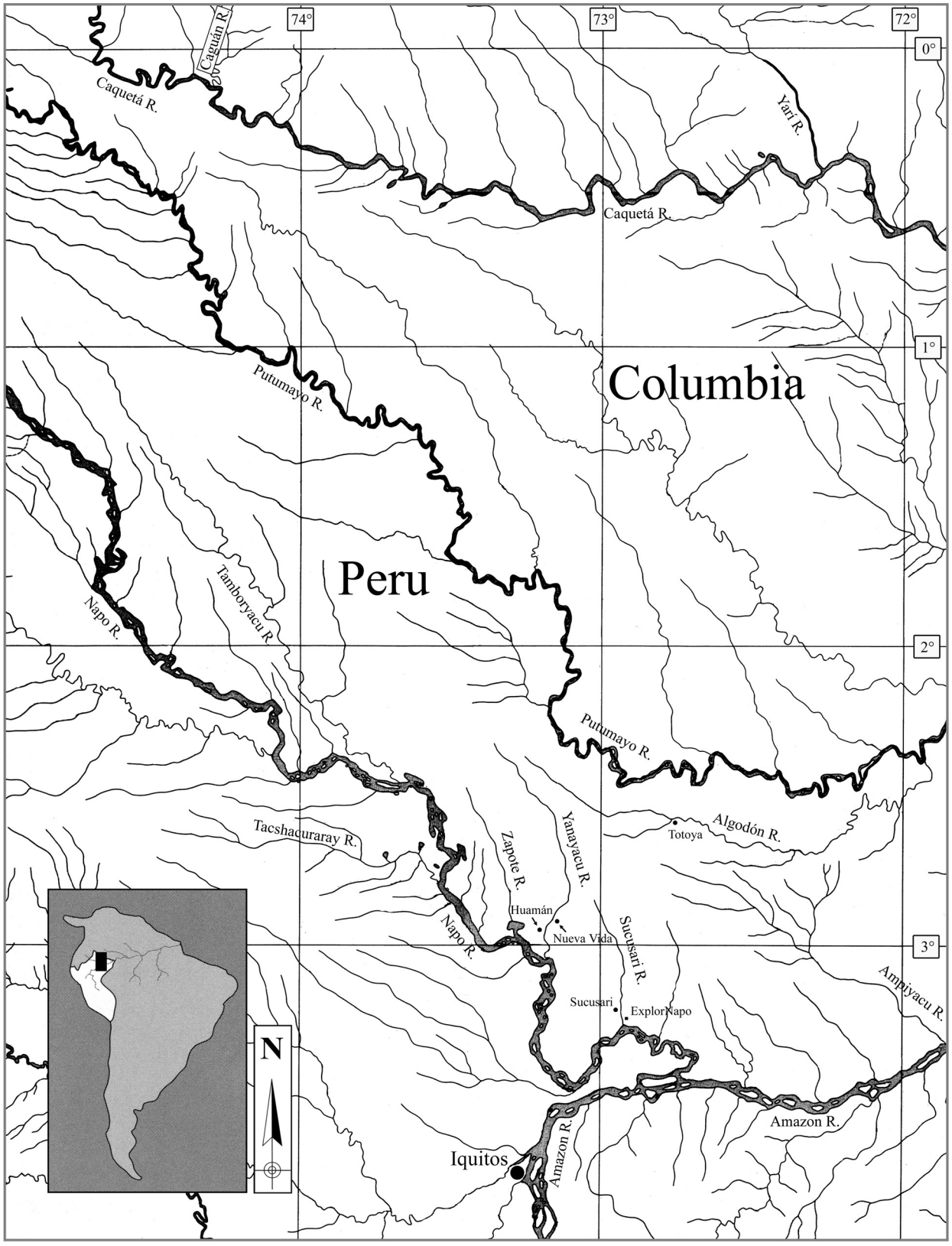


Figure 2-2. Map of the northeast Peruvian Amazon showing the location of Sucusari, the Maijuna community where all research was conducted. Map produced by International Expeditions and modified and used by the author with their permission.

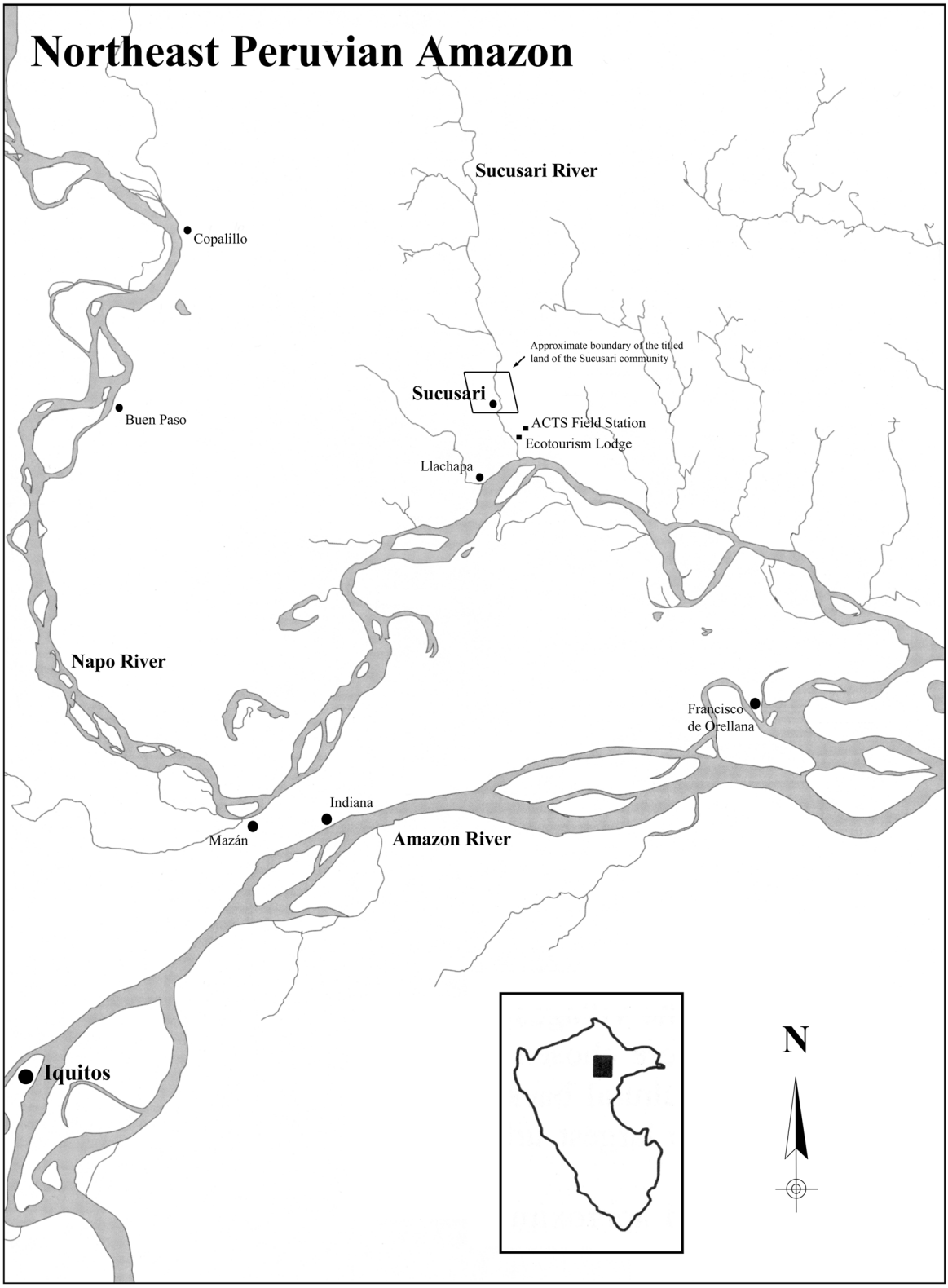


Figure 2-3. Cross-section of habitats defined by geomorphology by the Maijuna of Sucusari, Loreto, Peru. These data are presented following the approach of Fleck (1997) and Fleck and Harder (2000).

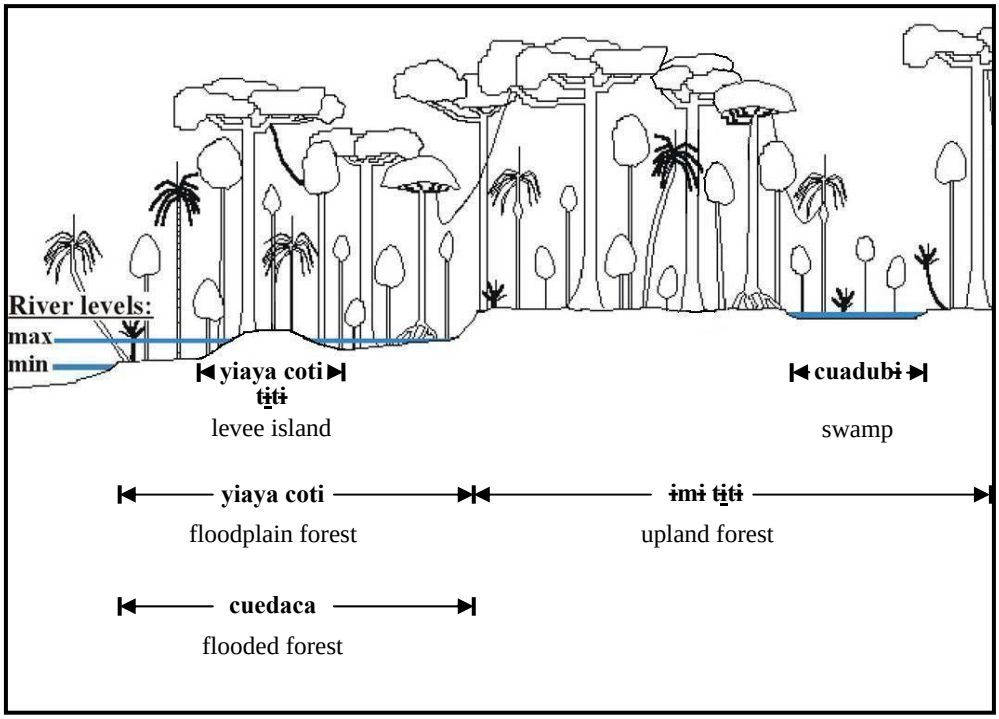


Figure 2-4. Cross-section of habitats defined by indicator plant species and located in areas with 'soft earth' (**cuadu**). Habitats recognized and classified by the Maijuna of Sucusari, Loreto, Peru. These data are presented following the approach of Fleck (1997) and Fleck and Harder (2000).

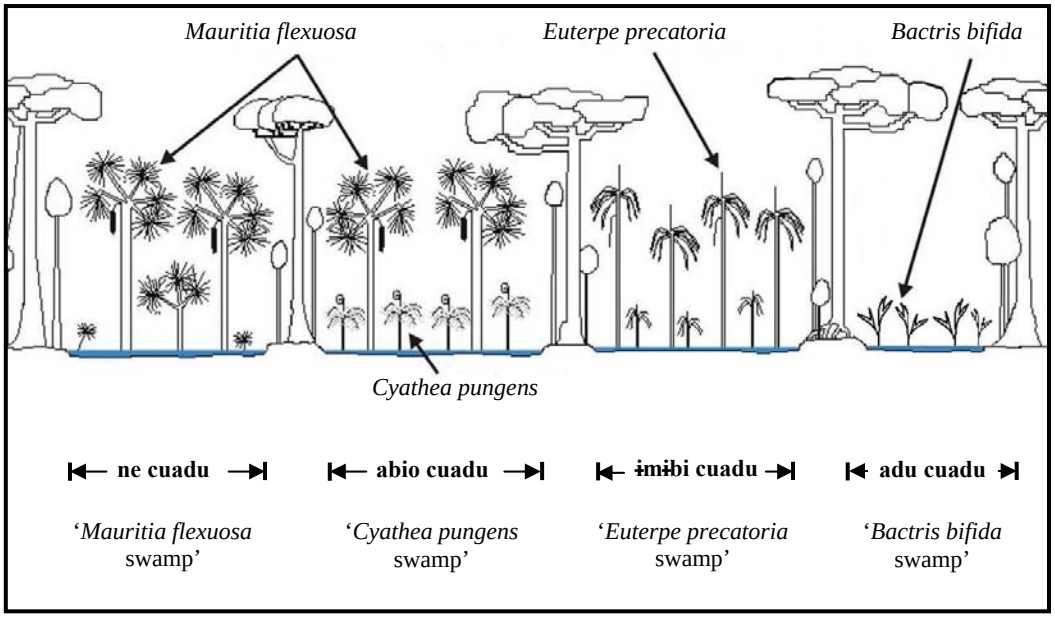
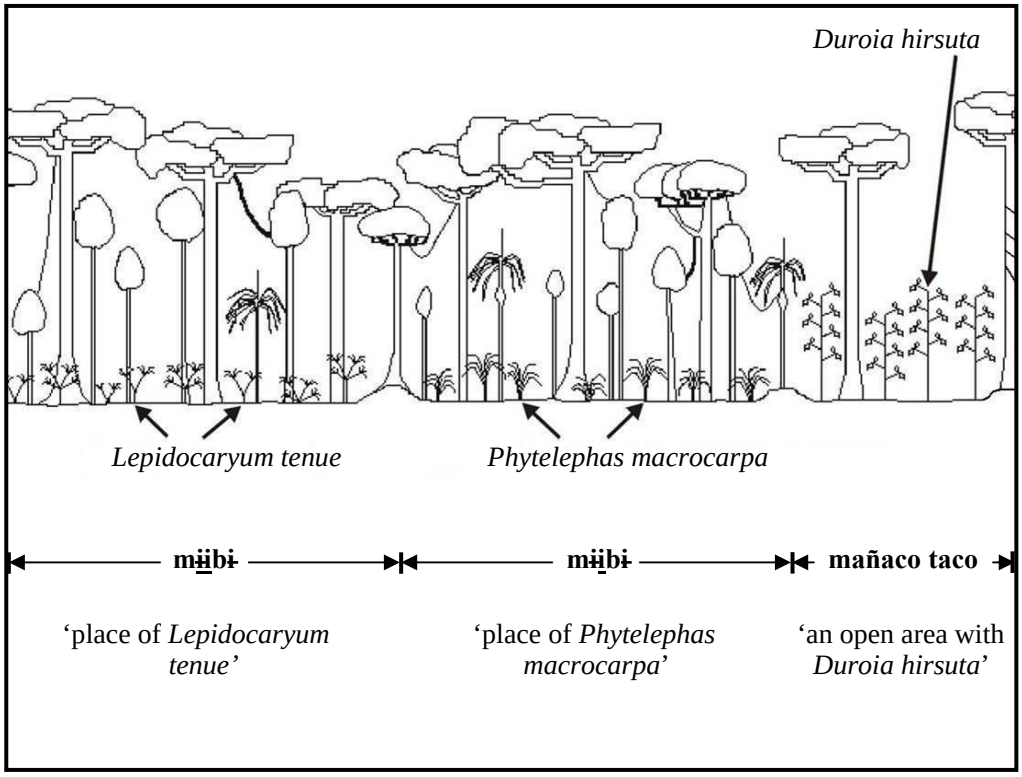


Figure 2-5. Cross-section of habitats defined by indicator plant species and located in areas that do not have 'soft earth' or 'ugly forest'. Habitats recognized and classified by the Maijuna of Sucusari, Loreto, Peru. These data are presented following the approach of Fleck (1997) and Fleck and Harder (2000).



Chapter 3: The cultural significance of the habitat mañaco taco to the Maijuna of Sucusari

Introduction

The Maijuna Indians of the Peruvian Amazon have a complex and detailed habitat classification system for both the forest and non-forest habitats found within the Sucusari River basin. An in-depth study regarding this habitat classification system was previously conducted and discussed in detail (see Chapter 2). The Maijuna classify over 70 different habitats within the Sucusari River basin based on geomorphology, indicator plant species, physiognomy, disturbance, and indicator animal species. In addition to solely providing a description of the Maijuna habitat classification system, the use, importance, and significance of the different habitat types was also investigated.

This chapter uses a case study approach to assess the cultural significance of one habitat in detail. The habitat selected for this study is called **mañaco taco**[1] by the Maijuna and it was chosen because they have well-defined and constructed supernatural beliefs associated with these forests. Understanding the significance and importance of habitat types to indigenous peoples is critical in understanding how they ultimately perceive and interact with these areas.

Mañaco taco are found in upland forest and are dominated by the small myrmecophytic tree or shrub *Durioa hirsuta* (Poepp.) K. Schum. (Rubiaceae). The most striking feature of a **mañaco taco** is its very open understory, contrasting sharply with the normally dense Amazonian rain forest (Figure 3-1). The name **mañaco taco** literally translates as an 'open area with *D. hirsuta*' which provides an appropriate description of this habitat. *Duroia hirsuta* forests have been reported elsewhere in the literature (e.g.

Aquino et al. 1999; Campbell et al. 1989; Davidson and McKey 1993; Duke and Vasquez 1994; Encarnación 1985, 1993; Fleck and Harder 2000; Frederickson et al. 2005; Page et al. 1994; Pfannes 2002; Schultes 1969, 1987; Schultes and Raffauf 1992). These forests are generally called *jardín del diablo* ("Devil's garden") in the Columbian Amazon (Schultes 1987), *limpo de canelo de vehlo* ("clearing of the shinbone of an old man") in the western Brazilian Amazon (Campbell et al. 1989), and *supay chacra* ("Devil's swidden" or "Devil's field") in the Peruvian Amazon (Duke and Vasquez 1994; Gilmore pers. obs.).

The Maijuna

The Maijuna (Mai huna), also known as the Orejón or Coto (Koto), are a Western Tucanoan people (Bellier 1993a, 1994; Steward 1946) presently found along the Sucusari, Yanayacu, and Algodón rivers of the northeastern Peruvian Amazon (Bellier 1993a, 1994). There are approximately 300 Maijuna individuals presently living in a total of four communities located along the above mentioned rivers (Figure 3-2) (Bellier 1993a, 1994).[2] All four Maijuna communities have received parcels of legally titled land from the Peruvian Government (Brack-Egg 1998). Not surprisingly, the titled land that the Maijuna have received represents a very small portion of their ancestral lands. Today, inhabitants of the three rivers have very little formal and informal contact with one another (Bellier 1993a, 1994; Gilmore pers. obs.).

Traditionally, the Maijuna are organized into patrilineal clans named after both plants and animals (Bellier 1993a, 1994). Clans practiced exogamy and uxorilocal residence upon marriage, ultimately dispersing the men of each clan (Bellier 1993a,

1994). As Bellier (1994) notes, clans did not have independent ancestors, stories, leaders, or territories. Today, many Maijuna traditions and cultural practices are no longer practiced by the Maijuna or have been significantly altered due to the impact of missionaries, the *patrón* system, governmental policies, mestizos, the regional society, and the formal education system, among other things (Bellier 1993a, 1994).

Study Site

All field research was conducted in the Maijuna community of Sucusari. Sucusari is located along the Sucusari River, a tributary of the Napo River, in northeastern Peru (Figure 3-3). The Sucusari community is located approximately 126 kilometers by river from Iquitos, the largest city and commercial center of the Peruvian Amazon. This general region of Peru has a mean annual precipitation of almost 3,100 mm per year and a mean annual temperature of 26º C (Marengo 1998). The Sucusari River basin is dominated by upland tropical wet forest yet seasonally inundated forest is also present (Gilmore pers. obs.). No other communities are located along the Sucusari River, although an ecotourism lodge, established in approximately 1983 (Castner 2000), is located about 4 to 4.5 kilometers downriver from the main community.

Sucusari is recognized as an official Native Community by the Peruvian Government and has legal title to 4,771 hectares (Brack-Egg 1998), a small fraction of their traditional land. The Sucusari community contains 20 mono-familial or pluri-familial houses with 97 residents in total. The majority of the residents of Sucusari are indigenous Maijuna, 71% are pure Maijuna and 12% are at least one half Maijuna (all figures from July 2001). The Maijuna and other members of the Sucusari community

participate in a variety of subsistence strategies, including hunting, fishing, swidden-fallow agriculture, and the gathering of various forest products. In addition, a variety of income generating strategies are also employed by members of the community. For example, community members sell game meat, domestic animals, agricultural produce, timber, and non-timber forest products to make money and they occasionally participate in wage labor within (i.e. logging) and outside of the community, among other things. In the beginning of this study, several families also occasionally sold tourist crafts to visitors from the ecotourism lodge downriver from the community however presently tourists very rarely visit the community.

Methods

Field research for this study was completed over three field seasons totaling approximately nine months from 2003-2004. During this time period nine Maijuna individuals (seven men and two women), ranging in age from approximately 38 to 78 years old, were interviewed regarding the Maijuna habitat classification system. During these interviews, **Mañaco taco** was identified as being a Maijuna recognized and classified habitat type and several consultants briefly and generally explained its significance. Intrigued by this information, I extensively interviewed my main consultant (a 50 year old Maijuna male) using semi-structured interviewing techniques (Cotton 1996) about the supernatural beliefs associated with **Mañaco taco** and its overall significance to the Maijuna. Within the Sucusari community, this consultant is recognized as one of, if not the most, knowledgeable person regarding Maijuna traditional knowledge and, most importantly, he is an excellent and patient teacher.

In addition to this information, a Maijuna traditional story regarding **Mañaco taco** was told by another Maijuna male consultant in the Maijuna language and recorded using a tape recorder. This story was transcribed in Maijuna, using the practical orthography established by Velie (1981), and translated into Spanish by the 50 year old male consultant described above. In addition to being very knowledgeable about Maijuna cultural traditions this individual is also perfectly bilingual and literate in both Maijuna and Spanish. One of the reasons why he is so competent in reading and writing in Maijuna is because he was one of the Maijuna individuals who worked with Velie during his work on the Maijuna language.

Data regarding ethnobotanical and ethnoecological knowledge and use practices associated with **Mañaco taco** and *D. hirsuta* were also collected via participant observation and open-ended interviews (Cotton 1996). Two groups of consultants, consisting of individuals previously interviewed about the Maijuna habitat classification system, were also interviewed using semi-structured interviewing techniques (Cotton 1996) to verify and supplement this information. One of the groups interviewed consisted of two males and the other group consisted of two males and one female, respectively.

In addition, several **Mañaco taco** were also visited and qualitative ecological observations were made during the above mentioned nine months of field research. Voucher specimens of *D. hirsuta* were collected with the help of Maijuna consultants and are deposited in the Herbarium Amazonense (AMAZ), Universidad Nacional de la Amazonia Peruana, Iquitos, Peru and the Willard Sherman Turrell Herbarium (MU), Miami University, Oxford, Ohio.[3] It should also be noted that all interviews during the

course of this study were conducted in Spanish and, when necessary, translated into Maijuna by my main Maijuna consultant. In addition, all data collected during the course of this study were coded, organized, and analyzed using a modified version of the methods described by Strauss and Corbin (1998).

Results and Discussion

As previously described, **mañaco taco** are anomalous open areas dominated by the small tree or shrub *D. hirsuta* in the normally dense and diverse Western Amazonian forest. Western ecologists and scientists have come up with a variety of different explanations as to why these areas are open. It was hypothesized by some that the open understory of **mañaco taco** was primarily due to allelopathy (Aquino et al. 1999; Campbell et al. 1989; Page et al. 1994; Pfannes and Baier 2002) yet it has recently been determined that *Myrmelachista* ants are responsible for clearing the vegetation around *D. hirsuta* (Frederickson 2005). Specifically, Fredrickson et al. (2005) report that the ant *Myrmelachista schumanni*, which nests in the stems of *D. hirsuta*, keeps the understory of **mañaco taco** open by poisoning all plants except *D. hirsuta* with formic acid. *Myrmelachista schumanni* worker ants bite small holes in the leaf tissue of invading plants and inject formic acid from their abdomens into these holes causing necrosis along primary veins within hours (Fredrickson et al. 2005). Not surprisingly, the Maijuna ascribe a completely different cause to the strikingly open nature of **mañaco taco**. According to the Maijuna, the understory vegetation in these areas is kept clear by invisible supernatural beings called **Ma baji** that reside in these forests. As explained by my main Maijuna consultant:

> "…I asked my mom one day. "Well," she said to me, "here in this **mañaco taco** where you see that it is open the people (**Ma bajɨ**) of these **mañaco taco** are workers, workers, and they can keep it open." She also told me, "In other swiddens (**mañaco taco**) (where) you see ugly places (i.e. understory plants) the residents (**Ma bajɨ**) of these (**mañaco taco**) are lazy, they do not know, they do not know how to clear their places."

Therefore, although **Ma bajɨ** are invisible supernatural beings, the physical manifestations of their work can be observed in the open appearance and structure of **mañaco taco**.

According to consultant testimony **Ma bajɨ** are male supernatural beings, not female, and they reside in all **mañaco taco** regardless of size. The components of the name **Ma bajɨ** can be dissected and translated ultimately providing a good description of these supernatural beings. For example, the word **ma** can be literally translated as 'red' whereas the morpheme **bajɨ** is the Maijuna designation for clan which bilingual Maijuna consultants generally translate as 'race' or 'group' (Bellier 1993a, 1994; Gilmore pers. obs.). Therefore, **Ma bajɨ** can be translated as 'red group', 'red race', or "red clan". According to consultant testimony, these supernatural beings are called **Ma bajɨ** because they paint their bodies red. As my main Maijuna consultant explained:

> "…Because **ma** is red and **bajɨ** is its race, no, of this group. So, we say **ma** because it (**Ma bajɨ**) is painted, they are painted with annatto, no, and it makes them red and for this reason we call them **Ma bajɨ**. Even though you cannot see them, no, we call them **Ma bajɨ** because sometimes our ancestors told us that **Ma bajɨ** is this way, they are painted with annatto, and that is their race. For that reason we call (them) **Ma bajɨ**…"

It is important to note that the species of annatto that is used by **Ma bajɨ** is not the normal cultivated variety *Bixa orellana* L. Instead, **Ma bajɨ** use their own wild relative of annatto, *Bixa platycarpa* Ruiz & Pav. ex G. Don, that the Maijuna call **bati bosa ñi** ('*B. orellana* of the spirit'). Interestingly, although **Ma bajɨ** resides in **mañaco taco** they also

occasionally leave these areas to wander around other parts of the forest. During these trips the smell of annatto tips off the Maijuna that **Ma baji** is close:

> "…**Ma baji** not only lives inside of a **mañaco taco**, he also always leaves to walk (around), this is certain. Because when we were in a house, a hunting camp, in our hunting camp, where there is no **mañaco taco**, nothing, in the evening we smelled a scent of annatto, no, and my mom said, "well, children **Ma baji** is passing by (and) for that reason there is a scent of annatto and we are smelling it." …So when they smelled (annatto) they said **Ma baji** is passing by and for that reason the smell of annatto arrives. Because certainly he (**Ma baji**) has to paint or put (annatto) on his body and have a scent of this, of annatto…"

When asked to describe **Ma baji** it was common for bilingual Maijuna consultants to use the words "madre" ("mother") and "dueño" ("owner") in regards to their relationship with **mañaco taco** and "demonio" ("demon" or "devil") and "espíritu malo" ("bad spirit") in general. Bellier (1993b: 42) provides a very good general description of the Maijuna concept of "madres":

> "The forest is inhabited by "madres" that incarnate the vital essence of plant and animal species, and all of the places. Protectors of their creatures, the "madres" possess aggressive powers that they use against mankind, alone or mediated by shamans. Under the aspect of "vital essence", the concept of "madre" is linked to the notions or ideas of "the power to generate" and "animation" that are typically feminine."

It is interesting to note that even though **Ma baji** are male supernatural beings they are still described as "madres" by the Maijuna. Although most of the Maijuna "madres" that Bellier (1993a, 1994) introduces and describes are female, at least one is also a male supernatural being like **Ma baji**. In addition to using the aforementioned words to describe **Ma baji** my primary Maijuna consultant also stated that **Ma baji** are "brujos" ("sorcerers") that possess some evil supernatural powers.

Ma baji, as is evident in the words that Maijuna consultants use to describe them, are not benevolent beings. In addition to clearing the understory of **mañaco taco**, the

Maijuna also attribute several other actions to **Ma baji**. For example, according to Maijuna consultants, **Ma baji** are malevolent beings that can rob the spirits or souls of babies and young children, eventually killing them. As my main Maijuna consultant stated:

> "…**Ma baji** are bad people…bad spirits. Because my father said that when you walk in the forest there are **Ma baji** and they also rob the (souls of) boys and girls and for that reason they (the boys and girls) die. Because that is what they do, that is his plan, no. They take away the spirits or souls of boys and girls and the boys and girls die…"

Due to the fact that **Ma baji** can harm babies and small children, Maijuna parents traditionally took several precautions to protect their children while in the presence of **mañaco taco**. For example, Maijuna parents did not enter **mañaco taco** with their children when traveling in the forest; instead they avoided entering these areas all together by walking around them. As a Maijuna male consultant explained:

> "They say that in **mañaco taco** it is forbidden to walk with small children because the "dueño" ("owner") (**Ma baji**) of the swidden (**mañaco taco**) always robs the spirits or souls of the small ones and the small ones die. That is why a shaman, a shaman, forbids the mothers who have small children to enter the **mañaco taco** because if they enter it is certain that the small one could die, because in the swidden (**mañaco taco**) it is forbidden to go in with children. Those that have children always must make a curve (around the **mañaco taco**), they must go around."

To provide more protection while in the presence of these forests, Maijuna parents would also normally cover their babies and young children with leaves or a piece of bark cloth and/or burn dry leaves while walking in front of their children. Burning dried leaves while walking in front of their children ensured that they would inhale smoke from the burning leaves and therefore they would "not be contaminated with the air of this **Ma baji**." In the unfortunate event that a Maijuna child did become ill due to perceived soul-

loss caused by **Ma baji** the services of a Maijuna shaman were sought out. As my main Maijuna consultant noted:

> "…A child six years old can become sick, no. Then you can approach a shaman and say, "my son suffers from this, he has this problem." Then the shaman cures you, no. Then the shaman is going to tell you what your son really has. Then he cures (your son) later at night (and) the following day (he will) say "Well, this child suffers from this. He does not have his spirit or soul in his body. The **mañaco taco** already took it, the spirit of the **mañaco taco** (**Ma baji**)." But if he cured him his spirit is going to return. And afterwards you should not go into the forest all of the time. It is forbidden to take small children because if you go all the time again you are going to have problems."

According to consultant testimony, shamans are the only ones that can cure soul-loss; Western medicine and other treatments are futile.

In addition to robbing the spirits and souls of babies and young children, **Ma baji** may also abduct young girls to raise them in **mañaco taco**. The abduction of a Maijuna girl by **Ma baji** is recounted in the following traditional Maijuna story entitled **Ma baji<u>de</u> quiij<u>a</u>** ('The story of **Ma baji**')[4]:

> [1]She was sweeping next to her house. [2]"What types of **chichibi** (South American coatis; *Nasua nasua*) are making a lot of noise?" (she said as) they bothered her. [*She mistook the noise created by the **Ma baji** as **chichibi***.] [3]After getting upset she returned to sweeping again. [4]Instantly, instantly the **Ma baji** grabbed (her daughter) and left. [5]Taking her, taking her (the **Ma baji**) raised her in a **mañaco taco**. [6]He always sang to her in a hammock. [7]Now she was grown-up and she felt hungry. [8](The **Ma baji**) left to bring (her) several **bichi** (pineapples; *Ananas comosus* (L.) Merr.) but she did not want to eat (them) and she said that (they) were not good. [9]"Perhaps you want to eat a **toto aqui** (a type of armadillo; *Dasypus* sp.)?" (the **Ma baji** asked her) and he brought it to her and she said that it was not good because it had a bad smell. [10]"What is it that you want now? I am going to bring you a **bichi toto aqui** (Southern naked-tailed armadillo; *Cabassous unicinctus*)," (the **Ma baji** said) and he brought it to her and she did not want it. [11]"What will I do with you? I am going to bring you a fruit of **micabi** (Annonaceae?)," (the **Ma baji** said) and he brought it to her and she did not want it and she said that it was not good to eat because it had a bad smell. [12]If you talk that way, perhaps you want your mom," (the **Ma baji** said). [13]"Yes, I want my mom," (she said). [14]"Tomorrow I am going to take you so that you see (her), if you are sad, if you are sad," (he said)

annoyed. [15]He took her (to see her mom) and he said, "Your mom lives here, enter. [16]I am going to wait for you here in this place, afterwards come to meet me." [17]She left and her mom saw her and it made her (mom) happy. [18]"My little daughter is coming, my little daughter is coming," (her mom said). [19]When she was going up the stairs (of the house), (her) mom said, "A person, a person can live (with my daughter) by giving her food, a person can live (with my daughter) by giving her food. [*Traditionally, the giving or exchange of food was one of the steps in establishing a permanent union*.] [20]The **Ma bajɨ** is not a person that you can live (with)." [21]"Did you raise her, did you raise her, why do you speak so quickly?" (her husband said as) he was annoyed with his wife. [22]She was there until the evening when they were sifting *chapo* (a type of thick drink) from ripe (plantains), already it was much too late. [23](Her mom) gave her a half-burnt stick from (the) fire, a clay pot, and a bunch of ripe (plantains) and she returned. [24]She returned, she returned…she returned and she carried it to her husband. [25]Now they were in the forest and (the **Ma bajɨ**) asked her a question, "What did your mom say, I heard (her talking)." [26]"She did not say anything, (she only said) my little daughter is coming, and it made her happy." [27]"I did not hear that. [28](I heard her say,) you can live with a person by giving them food, the **Ma bajɨ**, the **Ma bajɨ** is no good, it is not good that you have him (as your husband). [29](He) is not a person that you live (with), she said that, I heard it," (the **Ma bajɨ** said). [30]She annoyed him (and he said), "Return now, I do not want or love you." [31]Out of rage he took her spirit or soul, he took her spirit or soul, and immediately he disappeared. [32](She returned to her parent's house and) when her mom saw her (she said), "My little daughter is returning again." [33]"He heard what you said and he was annoyed with me and for that reason I am coming back (here)" she told her… [34]Grabbing her little brother she put him in a hammock and began to sing. [*In another version of this story she sang her brother the songs that* ***Ma bajɨ*** *previously sang to her*.] [35]She sang two times and then died. [36]That is everything.

This traditional Maijuna story ultimately highlights the danger that **Ma bajɨ** pose to young girls and reinforces the fact that Maijuna parents must remain vigilant in order to protect their children from **Ma bajɨ**.

Unlike Maijuna babies and young children Maijuna adults can enter **mañaco taco** without fear of having their spirits or souls taken by **Ma bajɨ** but there are certain taboos that affect how they interact with these forests. For example, the Maijuna do not use *D. hirsuta* (**mañaco ñi**) in any way out of fear of reprisals from its "dueño" ("owner") **Ma**

baji. For example, one Maijuna male consultant stated the following when asked if he eats the fruits of *D. hirsuta*:

> "The shamans say that it is forbidden to eat this fruit, you can die, it is forbidden… The old-timers did not eat this, they were scared… If you eat this you are not going to live, you are going to die… I have never tried it, never."

My main Maijuna consultant also recounted what his mom told him in regards to eating the fruits of *D. hirsuta*:

> "…She only said to me, "It is not good to eat the fruits (of *D. hirsuta*), it is forbidden, the "madre" (**Ma baji**) of **mañaco taco** can suddenly give, he can make you sick because he is a "brujo" ("sorcerer")…he is a "brujo" and he can give you a "virote" (invisible "dart" in the arsenal of sorcerers) and you can die…"

He also added his own thoughts:

> "So far I have never eaten (the fruits of *D. hirsuta*), I see the fruits yes but I never touch them… Because if you abuse (things) a lot he (**Ma baji**) can do anything…do not abuse (things) in the swiddens (**mañaco taco**). It is the same if you have your (own) swiddens. If a person is going to abuse (things in your swidden) and you are missing something from your swidden you get upset like an owner. And this (**mañaco taco**) also has a "dueño" ("owner") and he (**Ma baji**) becomes bitter when you touch his things. That is it."

Given the attitudes expressed in the above consultant testimony, it is not surprising that the Maijuna do not traditionally use *D. hirsuta*. Although the Maijuna do not make use of *D. hirsuta*, a variety of other indigenous and local peoples use it in a variety of ways (Table 3-1). In addition to not collecting *D. hirsuta* in **mañaco taco** the Maijuna also do not clear swiddens in these areas due to the same fears expressed above. Interestingly, there are no taboos against hunting in these forests. My main consultant suggested that this difference exists "…Because the animal goes into that place (**mañaco taco**) for perhaps a moment. It does not live there all of the time."

The local name for *D. hirsuta* dominated forests is *supay chacra* which means "Devil's swidden". As indicated by the local name of this habitat, mestizos and other local inhabitants in this general part of the Peruvian Amazon also have interesting traditional beliefs associated with these forests. In their *Amazonian Ethnobotanical Dictionary* Duke and Vasquez (1994) note, but do not clarify, that "Rural people (in the Peruvian Amazon), superstitious about the "Supay chacra", avoid walking nearby." It is not clear how local beliefs specifically compare or contrast to the traditional beliefs of the Maijuna as this was outside the scope of this study.

Several brief references to the supernatural beliefs held by other local and indigenous peoples regarding *D. hirsuta* forests are also mentioned in the literature. For example, Frederickson et al. (2005), in their work in the Peruvian Amazon, state that "'Devil's gardens'…according to local legend are cultivated by an evil forest spirit." Schultes and Raffauf (1992), in their discussion about "gardens of the Devil" in the Columbian Amazon, state that "The Indian believes that it has a supernatural cause–the residence of invisible beings." In addition, Schultes (1969, 1987) and Schultes and Raffauf (1990) note that indigenous peoples of the Columbian Amazon also believe that the lack of vegetation around *D. hirsuta* is due to a poison released by this tree that kills the surrounding plants; certainly a more mundane explanation for this habitat. Fleck and Harder (2000) note that the Matses Indian name for this habitat is *mayanën sebad* which translates as 'demon's swidden'. Unfortunately, they do not discuss the cultural beliefs surrounding this habitat yet the Matses name of this habitat generally suggests that there may be supernatural beliefs associated with it.

Two general references were also found regarding supernatural beliefs associated with *D. hirsuta* in general. For example, Schultes and Raffauf (1992) state that in the Columbian Amazon "The shrub (*D. hirsuta*) is also feared and respected as the sole arborescent inhabitant of strange, cleared areas in the forest called "Gardens of the Devil"." Additionally, Bennett et al. (2002), in their work with the Shuar of Eastern Ecuador, note that the Shuar name of *D. hirsuta* is *iwiank* which is from the word *iwia* meaning "demon". Again, unfortunately no specific information is provided regarding the significance of this name and therefore one is only left to speculate on its origins and cultural importance.

In short, it is clear from the few examples provided that indigenous and local peoples from a wide geographical area generally associate *D. hirsuta* and, more specifically, *D. hirsuta* forests with supernatural beings and forces. Even though many of the specific details of these traditional beliefs may be different, the fact that they are generally similar is extremely interesting. Unfortunately, what is not known is if these traditional beliefs have arisen independently within each of these different cultures or if they represent an exchange of general beliefs amongst them. Another interesting but perplexing question regarding *D. hirsuta* forests is why supernatural beings are associated with these areas. With respect to the Maijuna, it is not known exactly why there is a supernatural origin and being associated with **mañaco taco**. The incredibly anomalous appearance and structure of *D. hirsuta* forests may have something to do with this association. The fact that there are no readily apparent natural origins of these forests may cause the Maijuna and other indigenous and local peoples to turn to the realm of the supernatural for answers.

In conclusion, the Maijuna have extensive traditional supernatural beliefs associated with *D. hirsuta* forests. As detailed, this habitat is perceived as an especially dangerous place for Maijuna babies and young children due to their vulnerability and susceptibility to the malevolent deeds of **Ma bajɨ**. Due to the fact that Maijuna parents avoided **mañaco taco** when accompanied by babies and young children this habitat, in a traditional context, can reasonably be considered an "avoidance island" in certain situations. "Avoidance islands" are defined by Gilmore (Chapter 2) "as areas in primary or secondary forest that are generally avoided due to the plants or animals that are present and/or cultural beliefs (i.e. taboos, etc.) associated with them." It should be noted that the information presented in this paper represents traditional Maijuna knowledge and cultural beliefs. Today, most Maijuna individuals under the age of approximately 30 years old do not have extensive knowledge or understanding of the supernatural beliefs associated with **mañaco taco** and its malevolent supernatural resident **Ma bajɨ**. Regrettably, this is one symptom of a much larger problem associated with the degradation of traditional knowledge and beliefs amongst the Maijuna.

Notes

[1] All Maijuna terms are in bold. Transcription of Maijuna terms was accomplished with the help of a bilingual and literate Maijuna consultant using a practical orthography previously established by Velie (1981). The practical orthography developed by Velie (1981) consists of 27 letters that are pronounced as if reading Spanish, with the following exceptions: in a position between two vowels **d** is pronounced like the Spanish **r**; **ɨ** is pronounced like the Spanish u but without rounding or puckering the lips; and **a**, **e**, **i**, **o**, **u**, and **ɨ** are pronounced like **a**, **e**, **i**, **o**, **u**, and **ɨ** but nasalized. Also, the presence of an accent indicates an elevated tone of the voice; accents are only used when the tone is the only difference between two Maijuna words and the words meaning is not clarified by the context that it is found in. The 27 letters that make up the Maijuna alphabet are: **a, a, b, c, ch, d, e, e, g, h, i, i, j, m, n, ñ, o, o, p, q, s, t, u, u, y, ɨ, ɨ.**

[2] It is important to note that this population estimate does not include those Maijuna living in mestizo communities, other indigenous communities, or in Iquitos (Bellier 1994).

[3] Voucher specimens were collected by M. Gilmore under permit N^{o} 71-2003-INRENA-IFFS-DCB issued by the Instituto Nacional de Recursos Naturales (INRENA), Peru. *D. hirsuta* collection numbers are 424 and 537.

[4] A Maijuna version of this story is presented in Appendix II. The numbered sentences in the English version of this story correspond exactly to the Maijuna version.

Table 3-1. Ethnobotanical information corresponding to the use of *Duroia hirsuta* within the Amazon Basin.

Indigenous group or local population	Name for *D. hirsuta*	Use	Source
Shuar	*iwiank* (from *iwia* "demon"); *iwianki* (from *iwia* "demon")	stem: used for firewood fruits and bark: extract arrow poison	Bennett et al. (2002)
Quichua	*supai caspi*	ants associated with tree: eat (taste like lemon)	Bennett et al. (2002)
Waorani	*owekawe*	ants associated with tree: rub ant pheromones on inside of checks to relieve pain associated with excessive blowgun use or when mouth ulcers prevent blowgun use	Schultes and Raffauf (1990)
Kofán, Siona, Tikuna, Witoto, and other indigenous groups	*sha-ka-ker-ná-sê* (Kofán); *solimán* (Columbia)	bark: strips bound around arms and legs to make temporary tattoos	Schultes (1969, 1987); Schultes and Raffauf (1990, 1992)
Columbian Amazon	*solimán (solymán)*	leaves: used as a fish poison	Schultes and Raffauf (1992)
Columbian Amazon	not indicated	fruits: occasionally chewed to prevent cavities	Duke and Vasquez (1994)
Peruvian Amazon	*huitillo del supay*	stem: occasionally used in construction	Duke and Vasquez (1994)

Figure 3-1. A. A **mañaco taco** (forest dominated by *D. hirsuta*) located in upland forest in the Sucusari River basin. Note the very open understory of this forest. B. "Typical" upland forest in the Sucusari River basin. Note the density and diversity of this forest compared to **mañaco taco**.

Figure 3-2. Map showing the location of all four current Maijuna communities (Sucusari, Puerto Huamán, Nueva Vida, and San Pablo de Totoya), including the surrounding region.

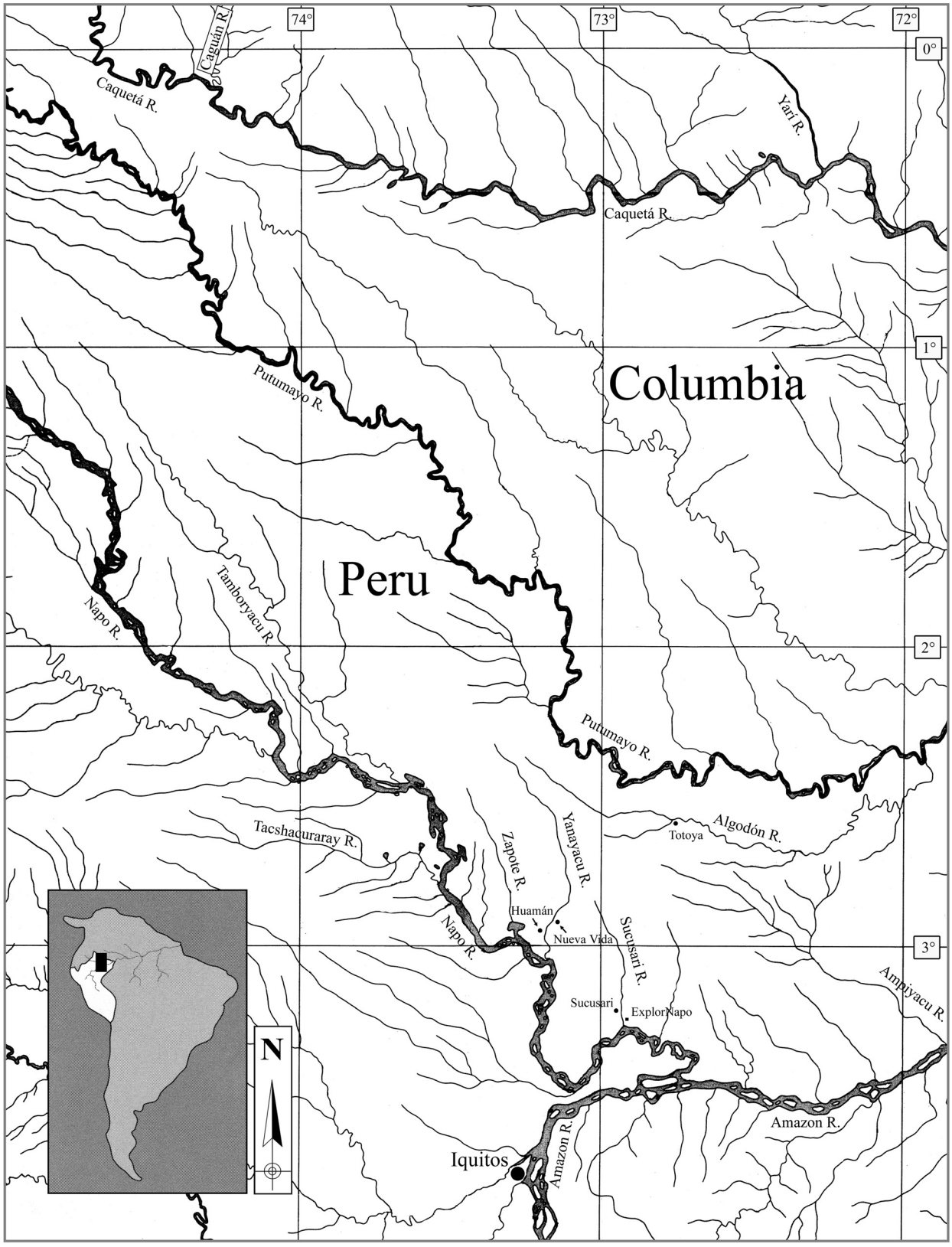
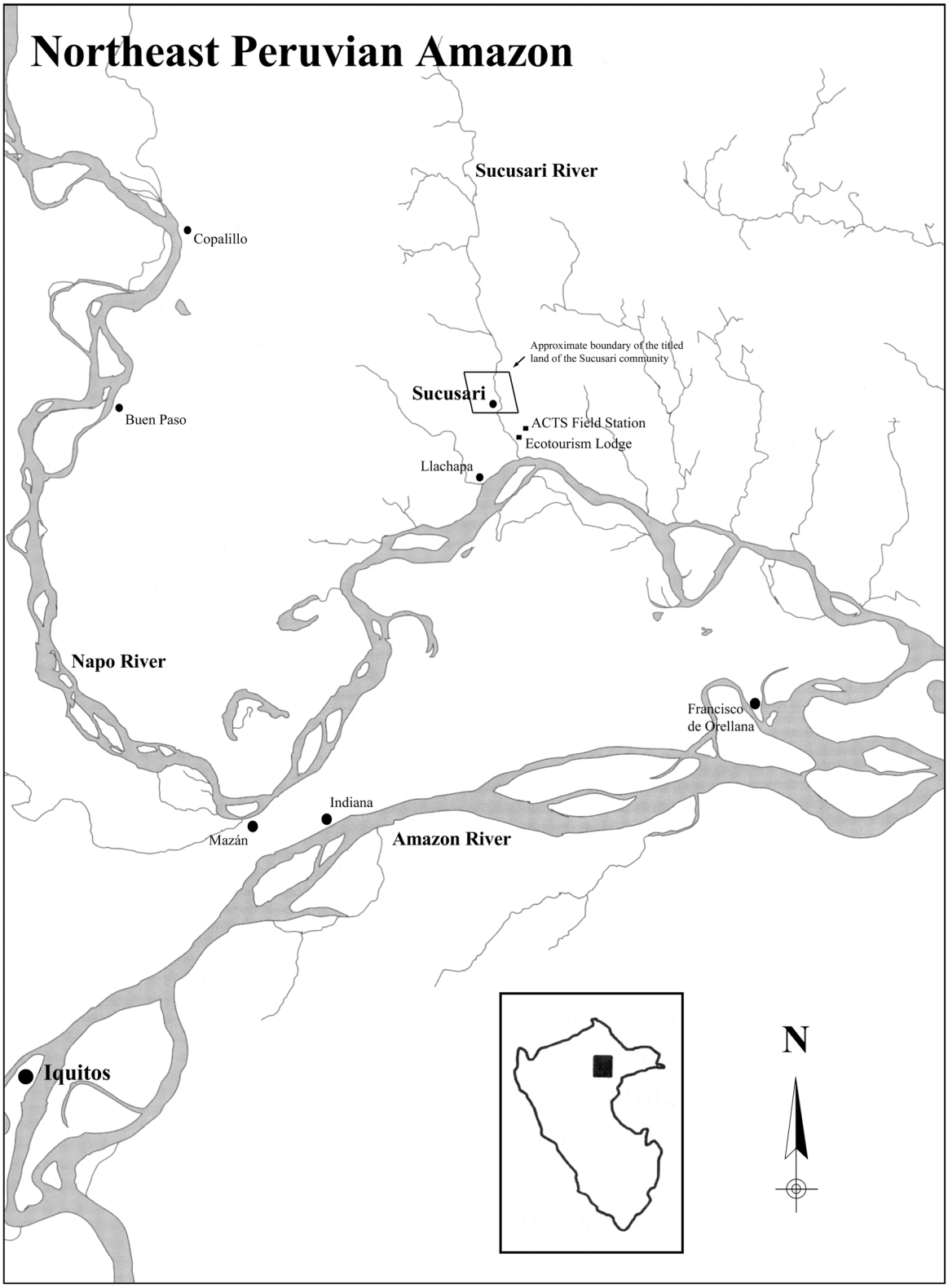


Figure 3-3. Map of the northeast Peruvian Amazon showing the location of Sucusari, the Maijuna community where all research was conducted. Map produced by International Expeditions and modified and used by the author with their permission.



Chapter 4: The use, construction, and importance of canoes among the Maijuna of the Peruvian Amazon[1]

Introduction

Canoes are an important and integral part of the life and subsistence strategies of the residents of the Peruvian Amazon. In an area with little to no roads life revolves around the area's rivers and canoes remain one of the main forms of transportation for both indigenous (Carneiro 1988) and non-indigenous people. Like other Amazonian residents, the indigenous Maijuna exploit their local flora for the raw materials necessary for canoe construction. To better understand the place and significance of canoes in the life of an Amazonian group canoe construction was studied in a Maijuna community. The objectives of this study were to: 1) understand the use and importance of canoes to the Maijuna, 2) understand the cultural and historical context of canoe construction, and 3) document the steps and plants used in constructing a canoe.

Study Site

Field research was conducted in Sucusari, a Maijuna community. Sucusari is located along the Sucusari River, a tributary of the Napo River, in northeastern Peru (Figure 4-1). The village is approximately 160 kilometers by river or approximately 15-20 hours by public boat from Iquitos, the unofficial "capital" and commercial center of the Peruvian Amazon. This region of Peru has a mean annual temperature of 26° C and a mean annual rainfall of 2,600 mm (Kalliola and Puhakka 1993). The community is located in an area dominated by "terra firme" or upland tropical wet forest (pers. obs.).

Sucusari is home to 97 individuals, the majority of whom are indigenous Maijuna (71% pure Maijuna and 12% at least one half Maijuna). The Maijuna, also referred to as the Orejon or Coto, are a western Tucanoan people that have traditionally inhabited this area of Peru (Bellier 1994; Steward 1946). In total there are approximately 300 Maijuna individuals found along the Sucusari, Algodon, and Yanayacu Rivers of the Peruvian Amazon (Bellier 1994). Sucusari is recognized as an official Native Community by the Peruvian Government and was granted title to 4,771 hectares in 1978 (Brack-Egg 1998). The Maijuna and other members of the community employ a variety of subsistence strategies, including hunting, fishing, swidden-fallow agriculture and the gathering of various forest products.

Methods

Initial fieldwork for this study was completed between July-August 1999 and March-July 2000. During this time period the partial construction of several canoes was observed and consultants were generally interviewed on plant use and preparation as related to canoe construction. An in-depth analysis of canoe construction was undertaken from July-August 2001. During this time period the construction of a dugout canoe was observed in full. Participant observation, still photography, and interviewing techniques were used at the canoe construction site to document the construction of this canoe and understand its cultural context (Banack and Cox 1987). From July-August 2001 fourteen Maijuna males, ranging in age from 22 to approximately 58 years old, were also individually interviewed regarding canoes in general, the cultural importance of canoes, and the plants used during and for canoe construction. During these interviews each

consultant was asked to list plant species that are or can be used to construct the hull, seats, and keel of a canoe and to rank these species according to preference (Cotton 1996; Martin 1995).

Interviews were conducted in Spanish and, when necessary, translated into Maijuna by Maijuna consultants. When possible, the Maijuna name of each plant and information pertaining to how each plant is prepared for its respective use was also collected. The Maijuna names for each part of the canoe were also documented. Transcription of Maijuna names was done with the help of Maijuna consultants and follows an orthography previously established by Velie (1981)[2]. Voucher specimens were collected with the help of Maijuna consultants and are deposited in the Herbarium Amazonense (AMAZ), Universidad Nacional de la Amazonia Peruana, Iquitos, Peru.

Results and Discussion

Importance and use:

Canoes are a very important and integral part of the life and subsistence strategies of the Maijuna and other residents of Sucusari. The following statement made by one Maijuna consultant highlights the importance of canoes.

> You cannot live without a canoe, it is very necessary to have a canoe. I cannot live without a canoe because you cannot go anywhere (without one)… Sure you can go and fish for a little while with a friend's canoe but you cannot take it for a long time. If you have a family you need to own a canoe.

Another Maijuna consultant also stated:

> Yes, it is necessary (to have a canoe)… To go out, to paddle in the forest, to take a ride with your family to another place, to collect yuca (*Manihot esculenta* Crantz) and plantains (*Musa x paradisiaca* L.). With a canoe, (you can) go to

> other places to have fields to grow yuca. With the canoe you can look for yuca and plantains, everything... Yes, it is a problem (not to have a canoe). We are stuck here (without a canoe), we cannot go to other places, here in the house and nothing more.

Canoes are used for hunting, fishing, traveling, communication, the gathering of various forest products, and carrying materials (i.e., to and from agricultural fields), among many other things. Older canoes that can no longer be used for the above-mentioned activities are not normally discarded instead they are used for other things such as, washing clothes, making masato (a local fermented beverage made from the tubers of *M. esculenta* or the fruits of *Bactris gasipaes* Kunth), and they are also flipped over and used as seats within houses.

Canoes in the community range in length from approximately 3-6 meters. Certain activities are normally associated with certain size canoes. For example, people in the community tend to use 3-4 meter, one or two person canoes for hunting, fishing, and spear fishing in small lakes and along rivers during the day and at night. According to consultants, smaller canoes allow the hunter or fisherman more mobility and speed because they are shorter in length and weigh less. These smaller canoes can therefore be maneuvered around fallen trees and other obstacles more easily. Canoes longer than 5 meters may also be used for fishing and hunting but they are also utilized to transport an entire family or a large amount of cargo (i.e. meat from a prolonged hunting trip, agricultural produce, *etc*.).

Highlighting the importance of canoes to the people of Sucusari and other communities in the area is the fact that canoes may be bought, sold, and traded within and among these communities. According to consultants, canoes are not normally bought and

sold between the people of Sucusari but they are sometimes sold to individuals from other nearby communities. In July and August 2001 canoes were typically sold by the meter, with 1 meter costing the equivalent of approximately U.S. $6. On top of this per meter charge, the carpenter may also earn up to the equivalent of approximately U.S. $9 more depending on the type of wood used for the hull of the canoe and the quality of craftsmanship involved.

Ethnohistory of the canoe:

It is difficult to determine exactly when the Maijuna began making and using canoes. Although we do not know exactly when this occurred, it is a fact that the types of canoes constructed and used by the Maijuna have changed over the years. As stated by older Maijuna consultants, the version of the dugout canoe (**you**) (Figure 4-2) that is currently constructed and used in the community is not the same type of canoe that was used by the Maijuna in the distant and even recent past. Up until approximately 20 years ago the type of dugout canoe used by the Maijuna was what they term a **basa you** or obada (local name).

Obadas and the current style of dugout canoe differ in several respects. First, according to Maijuna consultants obadas were only made from the tree *Cedrela odorata* L., or in Maijuna **yo ñi** (literally translated as canoe tree) or **yaometo ñi**. This differs greatly from the current style of dugout canoe constructed because many tree species can and are used for their construction. Second, according to Maijuna consultants, obadas were constructed using a different process than what is currently done. Principally, the construction of obadas did not involve widening their hulls by spreading the canoe apart

after drying it with fire. Also, the keels of obadas were carved directly out of the trunk, making them a one-piece unit with the hull and not an add on with nails after the canoe was finished, as is currently done. The fact that the sides of obadas were not spread apart after being dried by fire meant that splits or cracks along the hull of the canoe did not normally occur and therefore plant based sealants, which are a necessity today, were used little, if at all.

According to several consultants, the Maijuna began to switch from making only obadas to making the current type of dugout canoe in the late 1970's. As a 48-year-old Maijuna consultant stated:

> When I was a lot younger my father always showed me how to make obadas and nothing more. We traveled in obadas, they made pure obadas. I saw my father, my Uncle Luis, and Arturo, who is still living, traveling in obadas. Before, they never had the canoes that the mestizos (people of mixed Amazonian and European descent) now make, that we are now making. Before we only made obadas and nothing more, not the canoes of the mestizos.

According to consultant testimony, the first Maijuna individual to learn how to make this "mestizo" type of canoe was a male who learned this skill from his brother-in-law, a mestizo from another community, in the late 1970's. After learning this new skill he then spread his knowledge to other Maijuna by teaching them how to construct such canoes. Over the past approximately 20 or more years the switch from making obadas to making the current type of dugout or "mestizo" canoe has been complete. Out of the 20 or more canoes in the community that Maijuna individuals currently own none are obadas. Today, only a few older Maijuna individuals still know how to make obadas yet they are not currently making these types of canoes and therefore this skill and knowledge is not being passed on. Even though no one in the community is currently making obadas a few older Maijuna individuals indicated that they prefer these types of

canoes. As one of these older consultants stated, “I think that obadas are better because they don’t have holes or cracks in them (from the drying and opening process) and they are therefore dry.”

It is not clear exactly why the Maijuna have completely embraced the construction and use of the current type of dugout or “mestizo” canoe. One contributing factor may be the fact that, as several consultants stated, large individuals of *C. odorata,* the only tree that obadas were made from, are scarce around the community. This scarcity is most likely due to the selective logging of *C. odorata* for sale in the regional timber market, for use in local construction, and for use in constructing canoes. The making of the current type of dugout or “mestizo” canoe allows the Maijuna to choose from a larger pool of potentially useful tree species and individuals. This is the case because the current type of dugout or “mestizo” canoe can be made from a number of different tree species, not just *C. odorata,* and they can also be made from smaller size trees because their sides are spread apart and the canoe widened during the construction process, therefore compensating for their lack of girth.

Other types of canoes constructed:

Along with making the above-mentioned canoes the Maijuna also occasionally construct another type of a canoe that they term an **oda you** in Maijuna. Individuals make these types of canoes and temporarily use them to return to their homes when they are very far in the forest and do not have another canoe with them (i.e. during an extended hunting trip) or if they have a lot of cargo to transport and the canoe that they have with them cannot bear the entire load. According to Maijuna consultants this type

of canoe is only made from the palm *Iriartea deltoidea* Ruiz & Pav., whose trunk is distinctively swollen toward the middle or top, and is relatively fast and easy to construct, taking approximately 2 hours. The steps of constructing an **oda you** are as follows: the individual locates and cuts down a *I. deltoidea* palm tree, sections off the portion of the trunk that is swollen, removes one side of this swollen section, and digs out the center of this section creating a cavity. According to consultants, one has to be very careful while using an **oda you** because they do not have much resistance and can therefore tip over very easily.

Cultural context of canoe construction:

Canoes may be partially or completely constructed by individuals working alone or in small groups. Communal work parties or mingas, a common practice in the Peruvian Amazon and other tropical regions (Lamont 1999), are also used in Sucusari to partially or completely construct canoes, among many other things. According to consultants, individuals host mingas in order to speed up the canoe construction process and/or allow individuals who do not know how to make canoes by themselves employ the expertise and help of other knowledgeable individuals. The individual or family hosting the minga is expected to provide both food (**ao**) and masato (**ono**) to the invited participants and they are also usually obligated to participate in future mingas of their guests.

Throughout the canoe construction process Maijuna men and women have different roles and perform different functions, as in other activities (Bellier 1991a; Bellier 1991b). In the days leading up to the minga, men of the host family are usually

engaged in hunting, fishing, and the gathering of agricultural products to secure food to be served at the minga. Men also collect *M. esculenta* tubers (**jaso**) or *B. gasipaes* fruits (**ine**), sometimes with the help of women, for processing into masato. Once the food and ingredients of masato have been acquired it is the job of the women of the host family to prepare each of these. On the day of the minga, only men participate in the actual construction of the canoe while women serve food and masato to the participants at the beginning and/or end of the minga in the host family's house. The male host of the minga, and sometimes a woman, also serves masato throughout the day to the men at the canoe construction site.

Mingas are jovial events, accompanied by much laughter and joking, yet they also perform important social and cultural functions, providing an avenue of information exchange between younger and older and experienced and non-experienced individuals in the community. The knowledge or rights of canoe building are not exclusively held by any one group or person in the community, instead they are open to anyone who is interested in learning this craft. Several Maijuna consultants indicated that there is usually a head carpenter who is responsible for overseeing and directing the construction of a canoe during a minga, yet this is not always the case. The lack of a head carpenter and the consumption of too much masato while constructing a canoe, among other things, can sometimes lead to the production of a useless or worthless canoe. This is one reason why some individuals in the community do not like to have or use mingas to build their canoes. As one consultant stated, "It is better for me to build my own canoe than to have a minga, sometimes the canoes (made at mingas) aren't worth anything." Other reasons offered by consultants for not using mingas to construct canoes include a lack of

resources, food and/or masato. Whether this is an emergent trend away from the use of mingas in canoe construction remains in the realm of speculation. It is suggested that further research may elucidate more fully the cultural history of mingas and any trends in the social dynamics surrounding their use in canoe construction.

Tree selection for canoe hull construction:

To begin the construction process an individual must first select the tree (**ñi ja** or **suqui ñi ja**) to be used for the hull of the canoe. Seventeen tree species were identified as being useful for constructing canoe hulls (Table 4-1). Nine out of the 17 species specified were mentioned as being useful by more than one consultant, with *C. odorata* and *Pleurothyrium parviflorum* Ducke mentioned by 100% and 93% of consultants respectively (Figure 4-3). The distribution of responses in Figure 4-3 demonstrates the salience or importance of each tree species to the Maijuna, with culturally important or prominent species mentioned by all or a majority of consultants and less important species mentioned by fewer people (Martin 1995; Phillips 1996).

Thirteen out of 14 consultants interviewed prefer to use *C. odorata* to make their canoes while the next most preferred species is *P. parviflorum*, preferred by four consultants (some individuals mentioned an equal preference for more than one species). Consultants prefer *C. odorata* because of the length of time that these canoes last, the fact that the wood is soft and easy to work with, and because they are not heavy and therefore do not sink (in order of most common response to least). The 14 consultants interviewed had a total of 16 canoes made out of seven different species (Figure 4-4). Out of the 13 people that prefer to make their canoes out of *C. odorata* only three of these people

actually own a canoe made from this tree. Only four of the consultants interviewed own canoes made from their most preferred tree species while three out of the 14 people actually own canoes constructed from their least preferred species. Consultants indicated that this is due to the fact that large individuals of the more preferred tree species are scarce around the community and the surrounding rivers, especially individuals of *C. odorata* and *P. parviflorum***.** According to consultants, there used to be more *C. odorata, P. parviflorum,* and individuals of the other more preferred tree species located close to the community and rivers, in the distant and recent past, but these were harvested to make canoes, among other things. There are still individuals of the more preferred tree species located at considerable distances from the community and rivers yet these are not harvested due to the difficulty and work involved in carrying or dragging a partially or completely constructed canoe long distances over land.

The scarcity of the more preferred tree species used for canoe hull construction is resulting in an increased reliance of the Maijuna on the less preferred tree species. Due to the dynamic nature of cultures and "traditional knowledge" (Lee et al. 2001), it is possible that the Maijuna may continue to identify tree species that can be used to construct canoe hulls, reducing the impact of the current and future scarcity of these trees species. As one Maijuna consultant stated:

> I think that in the future we are going to have to make canoes from every type of tree… For example, there are many durable or strong trees (in the forest). In the future they are going to have to cut down a strong or durable tree and start to make a canoe and see if it opens and makes a good canoe. There are a lot of trees, big trees that can be used (to make canoes)… Possibly these trees can be used to get around. This is my opinion, to see if a tree that didn't serve a purpose before can serve one now.

Overall, several things factor into the tree selection process, including the size of the desired canoe, the tree species available, the distance available trees are located from the community and the surrounding rivers, and the preferences of the individual constructing the canoe. The average length of time a canoe made from the different tree species lasts is an especially important consideration that factors into the selection process. According to consultants, canoes may last from approximately 2 years, for some of the least preferred species, to up to approximately 5-6 years, for canoes made from *C. odorata*. After a tree is selected, the individual cuts the tree down, becoming, according to consultants, the "owner" of the tree. This designation is important considering the fact that most trees used for constructing canoe hulls are normally large enough to yield several canoes of varying sizes. The "owner" of the tree may then use the entire length of the trunk to construct several canoes for his family or he may allow other individuals, who have asked his permission, to make canoes from his tree.

Canoe construction process:

The construction process for the type of dugout canoe currently being made in Sucusari was documented and not that of obadas. This was done to document and understand current practices in the community and because no one is currently making obadas. The canoe construction process is long and labor intensive. For example, the construction of a 5.20 meter dugout canoe required four mingas (on average the construction phase of each minga was 6 hours long and consisted of 8 workers) and one day (6 hours) of individual labor to complete. Overall 27 species were identified as being specifically employed by the Maijuna to make canoes (Table 4-1). There are also many

other plant species that may be used during the canoe construction process, yet these are not chosen on a species-specific basis instead they are sought after and chosen based on one or more characteristics that they exhibit, such as strength and durability.

The canoe construction process can be broken down into several general steps: the selection and felling of the tree to be used, the carving and digging out of the canoe from the selected tree trunk, the drying and opening of the canoe, and the detailed finishing work. After selecting and felling the tree the length of the desired canoe is then measured and the carpenters begin to carve out the general shape of the canoe (Figure 4-5A). Cutting begins, using axes (**dɨo**), on the top surface of the felled trunk (hereinafter, the top) and the depth at which they cut into the tree is determined by several factors: 1) the diameter of the tree and the size of the desired canoe, 2) whether or not the tree has heartwood (**jɨja dadi**), and 3) if the owner of the canoe wants his canoe to be made only from heartwood. To understand some individuals' preferences for heartwood consider the following comments made by one Maijuna consultant about a canoe made from a *Clarisia racemosa* Ruiz & Pav. tree.

> Heartwood is necessary because it is stronger and lasts longer. It lasts several years, 3 or 4 years for guariuba (local name for *C. racemosa*). It lasts a long time. The sapwood (**jɨja madadi**) is very weak and only lasts for a little bit of time, sometimes only one year. The water eats it and then the canoe is not worth anything.

According to consultants, not all trees that are used to make canoes have **jɨja dadi** and not all individuals desire to use only this portion of the trunk due to the weight of the canoe produced.

The top of the trunk is removed so that it is level from side to side and sloping downward from a flat section in the middle of the trunk to both the bow (**you sani**) and

stern (**you toto**). As one Maijuna consultant stated about the 5.20 meter canoe mentioned above:

> There is a little more than 1 meter of slope on both sides and in the middle it is flat. This slope is necessary so when you go to open the canoe it has the capability of opening. The slope lifts up the bow (and the stern when opening the canoe) so there aren't problems. If you make this (the top of the canoe) flat across it doesn't help or allow you to open the canoe… You can open the canoe but it will break or split apart and the canoe will be ruined. The slopes help you to open the canoe.

After obtaining the desired slope (which dropped approximately 10 cm from the middle of the canoe to both the bow and stern for the above-mentioned canoe) and appearance, the carpenters trace the top-down shape of the desired canoe onto the top surface of the trunk. This may be accomplished in one of two ways. String (**ñunca me**) made from the palm *Astrocaryum chambira* Burret (**beto ñi**) may be dipped into a black liquid, produced from mixing water (**oco daca**) and the black powdery substance (**nea saɨ**) found within batteries, and wrapped around a series of nails that have been placed in the shape of a canoe. This blackened string may then be snapped against the trunk to leave the desired outline. Tracing the outline of a canoe may also be accomplished by wrapping the hanging roots of the epiphytic plant called **bichi me**, *Philodendron* sp., around the above-mentioned nails and tracing around the resulting shape with the black liquid mentioned above or with a piece of charcoal.

After the shape of the canoe has been traced onto the top of the trunk the carpenters, using the lines as a guide, begin to remove wood from the sides of the felled trunk (hereinafter, the sides) (Figure 4-5B), bringing the bow and stern to a flattened point (Figure 4-5C). After obtaining the desired shape or form for the sides of the canoe they begin to remove wood from the middle and inside, leaving sideboards (**you unu me**)

that are approximately 3 cm or more thick. The inside of the canoe is not entirely and perfectly dug out at this point in the construction process, instead the carpenters usually dig out just enough of the inside to make the trunk or canoe light enough to roll over so they can begin working on the bottom side of the felled trunk (hereinafter, the bottom).

Wood is taken off of the bottom of the trunk in the same general shape and form as it was from the top. The bottom of the canoe is sloped downward toward its bow and stern at the same places that the slopes began on top. Carpenters use *A. chambira* string or pieces of the hanging roots of *Philodendron* sp. as a level, by attaching them to nails at both ends of the canoe, to make sure that both the bow and stern have smooth slopes. After the correct slope has been obtained, the slopes of the canoe have been smoothed, and the bottom of the canoe has been leveled off from side to side, a black line is drawn, using the same methods described above, down the length of the canoe. They then begin to round off the square sides of the bottom of the canoe using the black centerline as a guide, giving the canoe its rounded form.

Once both sides are rounded off equally and at the same pitch the canoe is then flipped back over and wood is again removed or dugout from the inside of the canoe, forming a cavity (**you yacu**) (Figure 4-5D). To remove wood from the inside of the canoe carpenters use axes and a tool that the Maijuna call **you totecou**, which is a chisel attached to a long pole made from the trunk of a small, durable tree. The sideboards of the canoe are left approximately 3 cm or more thick because some of the wood will be burnt away and removed during the drying and subsequent processing of the canoe. If the sideboards are too thin before the drying process they run the risk of burning holes or damaging them during processing. They also do not want the sideboards to be too thick

because this ultimately increases the weight of the canoe and makes it harder to open or spread the sides of the canoe apart after the drying process, sometimes causing the canoe to split or break apart. During this phase of the construction process the carpenters working on the canoe have to be extremely careful that they do not cut all the way through the sides of the canoe. According to consultants, they listen to the sound that the canoe makes when hit, the thickness of the canoe affects the sound that is resonated, and they constantly check the thickness of the sides of the canoe by placing their two hands directly opposite each other on the outside and inside of the canoe.

At this point in the construction process preparations are made to drag or carry the canoe, depending on the canoe's weight and how many men are present, closer to a river where the canoe will then be dried, opened, and ultimately finished. The canoe may also be dragged or carried after it has been opened, yet the exact time that the canoe is moved depends on its owner and the availability of manpower. The dragging or carrying of canoes is usually necessary because many of the trees that are used to make canoes are not located directly next to the community or the surrounding rivers, possibly due to over harvesting or the fact that some of the species used may be upland species and therefore not naturally found next to rivers. Before moving the canoe, trails through forest and/or fields are cut or widened to allow easier passage. Also, several plants are usually gathered in preparation to drag a canoe, including forest vines and small or immature trees. There are not specific species that are collected, instead they are collected based on certain characteristics, strength and durability, that may be met by any number of species. The vines that are collected are used for a variety of purposes: two or more long pieces are tied to a small piece of wood that is wedged into the opening of the canoe's bow,

another long piece is made into a tight fitting hoop that is placed over the stern of the canoe, and another piece serves as a resistance, connecting the wedge of wood in the front of the canoe to the hoop in the back. The two or more long pieces of vines that are attached to the front of the canoe, referred to as **you bɨdɨme** in Maijuna, are used to pull the canoe while the hoop of vines (**you agu**) over the stern of the canoe is used as a point of resistance for a long piece of strong wood (**you bɨdɨjɨ quɨo tɨca**) that is used to push, steer, and pilot the canoe over the ground. To give an idea of the distance that canoes are sometimes pulled and the work involved, the 5.20 meter dugout canoe mentioned above was pulled and pushed over undulating topography, through forest and fields, by seven men for approximately 2.5 hours (a distance that normally took approximately 25 minutes to walk).

Once the canoe is in the desired position preparations are made to dry and spread the sides of the canoe apart. A stand to raise the canoe off of the ground must first be constructed out of small or immature trees that are collected based on strength and durability. A stand consisting of two posts (**sagu**), placed in the ground, and a cross piece (**jemetuitɨca**), placed at a distance of 35-40 cm over the ground, is constructed at both ends of the canoe. Before drying, pieces of aluminum (**quiu**) from old pots, secured into position with nails, are placed over cracks or splits in the hull and sideboards of the canoe to prevent them from further splitting during the drying process. The canoe is placed onto the stand upside down and a fire (**toa**) is started along the entire inside length of the canoe and carefully tended so it is concentrated in between the sideboards. Mud is placed into and over the cracks of the canoe and along portions of the sideboards to keep them from drying out too much and to prevent further splitting. The carpenters are

constantly looking up into the overturned canoe, touching the top of it with their hands, and hitting the top of the canoe to listen to the sound that it makes to see if it is drying uniformly, identifying areas that require more or less fire. When the canoe reaches a critical point and becomes very hot and dry, approximately 1.5-2 hours into the drying process, it begins to ignite and slowly becomes engulfed in flames. At this time, dry leaves (**cuenese jao**) of the palm *Mauritia flexuosa* L. (**ne ñi**), which are preferred by many of the consultants interviewed, and/or more firewood is placed into the fire causing it to explode and completely engulf the hull in flames (Figure 4-6A). This part of the drying process is considered a signal for the carpenters. As one consultant states, "(When this happens) the trunk or tree indicates that it is dry and ready to be opened."

Immediately after the fire has died down the canoe is flipped over, secured, and slowly opened with the help of pry bars (**you bɨa sagu**) made of wood (Figure 4-6B). Many consultants specifically use the base of the palm *Astrocaryum murumuru* Mart. var. *macrocalyx* to make **you bɨa sagu** while others use any strong, forked piece of wood. As the canoe is being opened wooden braces of progressively larger sizes are wedged into the opening, the final braces being secured with nails. According to consultants, canoes are opened slowly to reduce splitting or cracking and to allow the carpenters to look at the form of the canoe and make adjustments if necessary. To give an idea of the increase in width achieved by drying and opening a canoe, consider that the original width of the opening of the 5.20 meter canoe mentioned above was 38 cm and after drying and opening was 91 cm, an increase of 53 cm.

After the canoe has slightly cooled for approximately 30 minutes the tops of the sideboards (Figure 4-2) are leveled off using axes and machetes (**quiudɨ**) and the charred

portion on the inside of the canoe is removed using what the Maijuna call a **yo tetoco**, a type of broad bladed, hand held chisel (Figure 4-6C). After the inside of the canoe has been cleaned of charred material the seats (**you ñui toto ja**) (Figure 4-2) are installed. Twelve out of 12 Maijuna consultants mentioned the use and preference of *C. odorata* and 11 out of 12 mentioned the use and preference of *P. parviflorum* for canoe seats yet they are also sometimes made from the same tree that the canoe is made from (Table 4-1). The seats are strategically placed to leave a large space in between the middle and back seats providing an area to put cargo (Figure 4-2). The cracks or splits in the hull of the canoe are also fixed by smoothing them out, affixing new pieces of aluminum, and filling in the remaining spaces with the processed latex of various tree species (Table 4-1) (Figure 4-6D). Some types of latex can be used pure but the creation and use of specific combinations of two or more types of latex, sometimes including kerosene or motor oil, is more common (the most common mixture used is that of *Couma macrocarpa* Barb. Rodr. and *Tetragastris* sp.). To fix larger cracks or splits in the canoe, pieces of old shirts are dipped into the boiling sealant or tar (**maja**) and stuffed directly into the hole acting as a filler (Figure 4-6D).

One of the final steps in the construction of a canoe is the production and attachment of the keel (**you quioco**). *Cedrela odorata* and *P. parviflorum* were specifically mentioned by many of the consultants as being used for the keel while other consultants did not specify particular species, saying that the keel can be made from the tree that the canoe was made from or whatever tree that is desired. Some consultants do not feel that the selection of a particular species for the production of the keel is especially critical because debris or sunken logs in the river often rip them off before the

keel actually wears out. To pass over debris or sunken logs easier, keels are raised in the middle and gradually slope toward both the ends (Figure 4-2). After the keel has been attached with the help of nails, the canoe is carried or dragged to the river where it can then be utilized (Figure 4-6E).

Conclusion

Canoes are an integral, essential, and culturally important part of the life and subsistence strategies of the Maijuna. The current canoe construction process is a long and technical process employing the use of a variety of specific and non-specific plant species. The scarcity of large individuals of the more preferred tree species used for canoe hull construction around Sucusari and the surrounding rivers affects the types of canoes constructed. The vast majority of individuals do not own canoes made from their most preferred tree species and the complete switch by the Maijuna, over the past 20 years, from making traditional obada canoes may have been partly due to the lack of large individuals of *C. odorata*, the only tree species that obadas were made from. It is predicted, based on consultant testimony and the lack of large individuals of the more preferred species, that the Maijuna will continue to rely more heavily on the less preferred tree species and will experiment with and identify new tree species for use in canoe hull construction. An in-depth study on the impact and sustainability of canoe construction on local tree populations would be helpful in developing sustainable harvesting practices to prevent the disruption of this culturally important activity.

Notes

[1] Previously published in the journal *Economic Botany*:

Gilmore, M. P., W. H. Eshbaugh, and A. M. Greenberg. 2002. The Use, Construction, and Importance of Canoes among the Maijuna of the Peruvian Amazon. Economic Botany 56(1): 10-26.

[2] Maijuna terms are in bold. The alphabet developed by Velie (1981) consists of 27 symbols that are pronounced as if reading Spanish, with the following exceptions: **ɨ** is pronounced like the Spanish u but without puckering the lips; in a position between two vowels **d** is pronounced like the Spanish r; and **a̲**, **e̲**, **i̲**, **o̲**, **u̲**, and **ɨ̲** are pronounced like **a**, **e**, **i**, **o**, **u**, and **ɨ** but nasalized. Also, the presence of an accent indicates an elevated tone of the voice.

Table 4-1. Plants used for canoe construction by the Maijuna.

Taxon	Maijuna name	Maijuna translation	Local name	Uses[1]	Plant part	Voucher[2]
Apocynaceae						
Couma macrocarpa Barb. Rodr.	**bito ñi**	**bito**= resin **ñi**= tree	leche caspi	SL	latex	392
Araceae						
Philodendron sp.	**bichi me**	**bichi**= long **me**= rope	itininga	ST	vine	394
Arecaceae						
Astrocaryum chambira Burret	**beto ñi**	**beto**= proper name of tree **ñi**= tree	chambira	ST	spear leaf	314
Astrocaryum murumuru Mart. var. *macrocalyx* (Burret) A. Hend.	**chida ñi**	**chida**= proper name of tree **ñi**= tree	huicungo	PB	trunk	312
Iriartea deltoidea Ruiz & Pav.	**oda ñi**	**oda**= proper name of tree **ñi**= tree	huacrapona	HO	trunk	322
Mauritia flexuosa L.	**ne ñi**	**ne**= proper name of tree **ñi**= tree	aguaje	FE	leaves	321
Bombacaceae						
Scleronema praecox Ducke	**manu ñi**	**manu**= name of an unidentified bird species **ñi**= tree		HU, SE, KE	trunk	397

Taxon	Maijuna name	Maijuna translation	Local name	Uses[1]	Plant part	Voucher[2]
Burseraceae						
Tetragastris sp.	**bayidi ñi**	**bayidi**= proper name of tree **ñi**= tree	copal	SL	latex	380
Caryocaraceae						
Caryocar glabrum (Aubl.) Pers.	**i̲ ñi**	**i̲**= louse **ñi**= tree	almendra	HU, SE, KE	trunk	403
Clusiaceae						
Calophyllum longifolium Kunth	**mɨca toto ñi**	**mɨca**= name of an unidentified fish species with tough scales **toto**= fish scale **ñi**= tree	lagarto caspi	HU, SE, KE	trunk	407
Garcinia madruno (Kunth) Hammel	**necuadu maja ñi**	**necuadu**= *Mauritia flexuosa* palm swamp forest **maja**= tar **ñi**= tree	copal de aguajal, brea de aguajal	SL	latex	405
Fabaceae						
Apuleia leiocarpa (Vogel) J. F. Macbr.	**ɨmɨ soa ñi**	**ɨmɨ**= above, on top, or up **soa**= red **ñi**= tree	ana caspi	HU, SE, KE	trunk	404
Cedrelinga cateniformis (Ducke) Ducke	**mɨa ñi**	**mɨa**= above or to go up **ñi**= tree	cedroline, tornillo caspi	HU, SE, KE	trunk	409

Taxon	Maijuna name	Maijuna translation	Local name	Uses[1]	Plant part	Voucher[2]
Hymenolobium sp.	**ajosini ñi**	**ajosini**= to introduce a feather inside of the ear to relieve itching **ñi**= tree	mari mari	HU, SE, KE	trunk	382
Lauraceae						
Anaueria brasiliensis Kosterm.	**maso joda ñi, joda ñi**	**maso**= *Myoprocta pratti* (this animal eats this tree's fruit) **joda**= center or middle **ñi**= tree	añushi rumo	HU, SE, KE	trunk	383
Chlorocardium venenosum (Kosterm. & Pinckley) Rohwer, H. G. Richt. & van der Werff	**biya ñi**	**biya**= general name for moenas **ñi**= tree	palta moena	HU, SE, KE	trunk	379
Pleurothyrium parviflorum Ducke	**biya ñi**	**biya**= general name for moenas **ñi**= tree	canela moena	HU, SE, KE	trunk	381
Meliaceae						
Carapa guianensis Aubl.			andiroba	HU, SE, KE	trunk	391
Cedrela odorata L.	**yo ñi, yaometo ñi**	**yo**= canoes **yaometo**= proper name of tree **ñi**= tree	cedro	HU, SE, KE	trunk	398

Taxon	Maijuna name	Maijuna translation	Local name	Uses[1]	Plant part	Voucher[2]
Moraceae						
Brosimun lactescens (S. Moore) C. C. Berg	**oyo bito ñi**	**oyo**= bat **bito**= resin **ñi**= tree	chingonga	SL	latex	384
Clarisia racemosa Ruiz & Pav.	**bisu ñi**	**bisu**= name of a hunting whistle made from this tree's wood **ñi**= tree	guariuba	HU, SE, KE	trunk	402
Perebea guianensis Aubl.	**jaima bito ñi**	**jaima**= big or large **bito**= resin **ñi**= tree	caucho macho	SL	latex	388
Myristicaceae						
Virola pavonis (A. DC.) A. C. Sm.	**cudu ñi**	**cudu**= proper name of tree **ñi**= tree	cumala	HU, SE, KE	trunk	406
Vochysiaceae						
Vochysia lomatophylla Standl.	**ma pede ñi**	**ma**= red **pede**= plank (of wood) **ñi**= tree	cashu caspi	HU, SE, KE	trunk	393
Unknown 1	**bɨya ñi**	**bɨya**= general name for moenas **ñi**= tree	puchiri moena	HU, SE, KE	trunk	not collected
Unknown 2	**eobɨ ñi**	**eo**= poison **bɨ**= place with a lot of something **ñi**= tree	catahua	HU, SE, KE	trunk	not collected

Taxon	Maijuna name	Maijuna translation	Local name	Uses[1]	Plant part	Voucher[2]
Unknown 3			mauba	HU, SE, KE	trunk	not collected

[1] Key to Uses: FE = fuel; HO= hull of an **oda you**; HU = hull; KE = keel; PB = pry bar; SE= seat; SL= sealant; ST = string

[2] Specimens were photo vouchered and collected by Arévalo-García and Gilmore under the auspices of AMAZ. All voucher specimens are deposited in AMAZ.

Figure 4-1. Map of the northeast Peruvian Amazon showing the location of Sucusari (map produced by International Expeditions and modified and used by the authors with their permission).

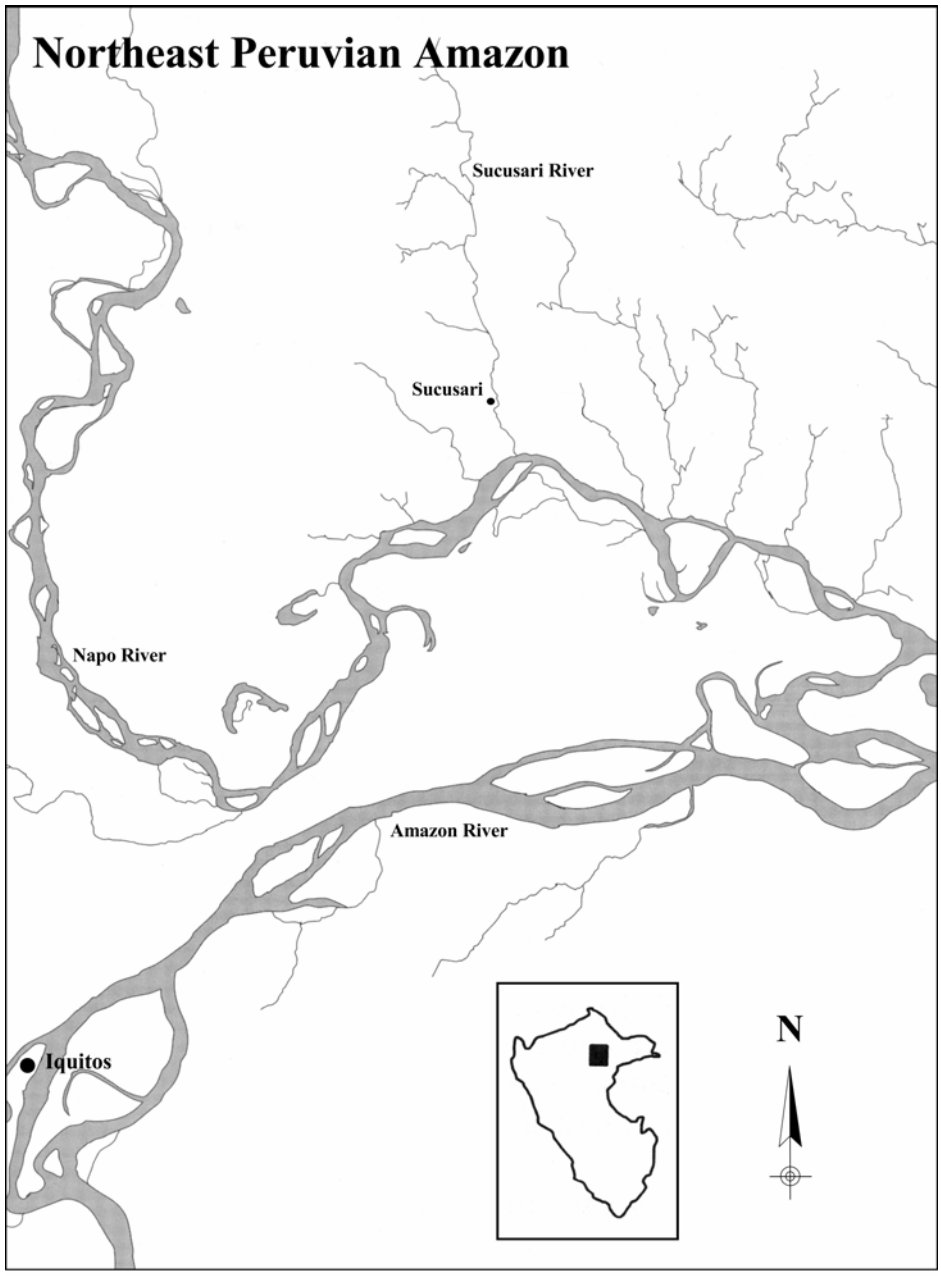


Figure 4-2. Drawing of a typical dugout canoe (**you**) constructed in Sucusari. Maijuna names for canoe parts are in parenthesis.

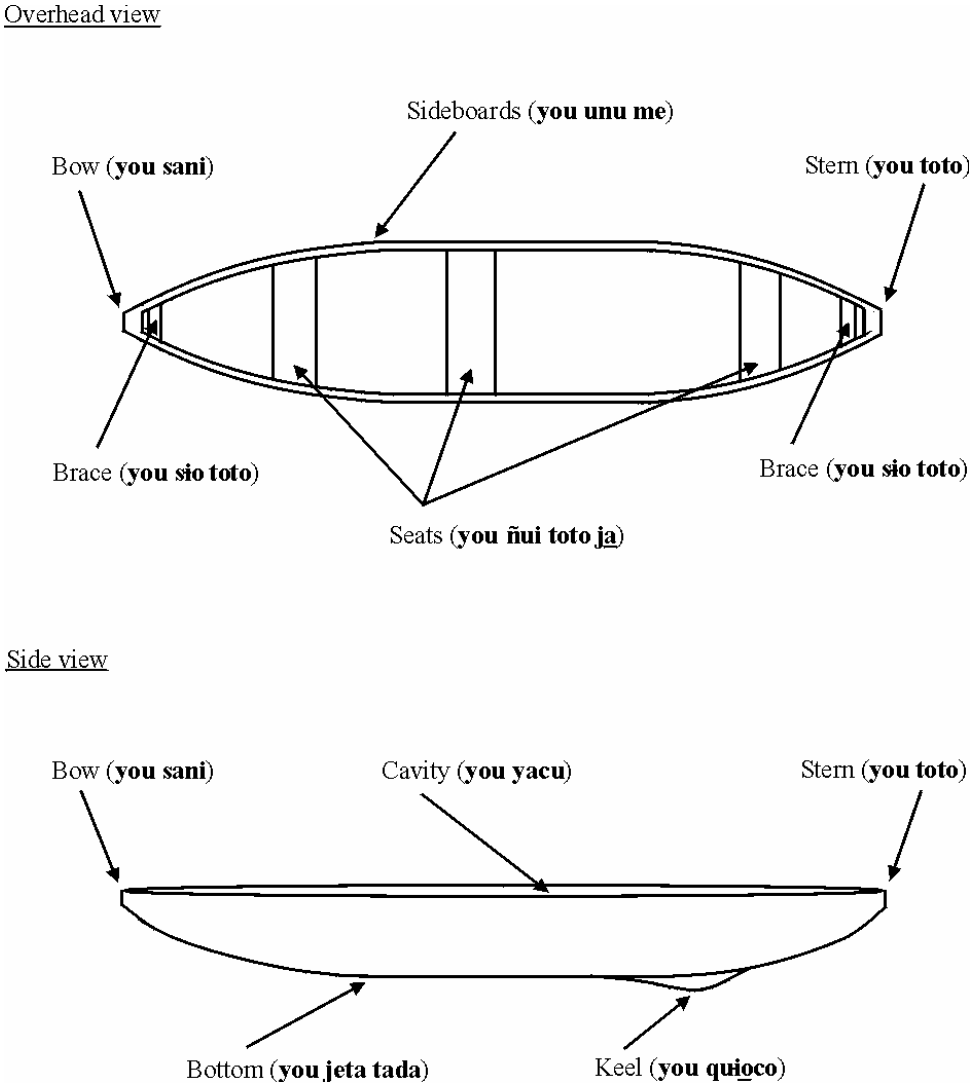


Figure 4-3. Number of consultants (n= 14) who mentioned each species for use in constructing canoe hulls. See Table 1 for Maijuna names, local names, and uses corresponding to each species.

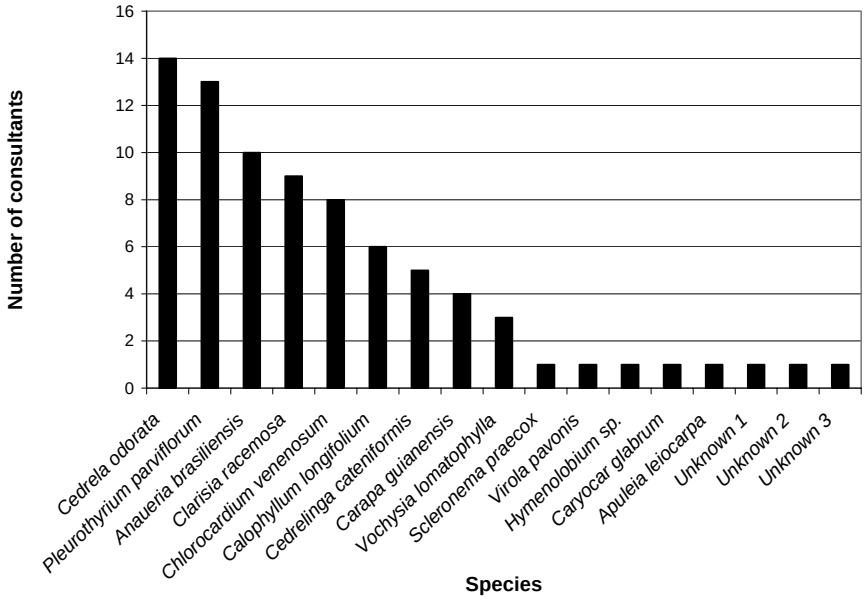


Figure 4-4. Number of consultants (n= 14) that own canoes (total number of canoes= 16) made from each species.

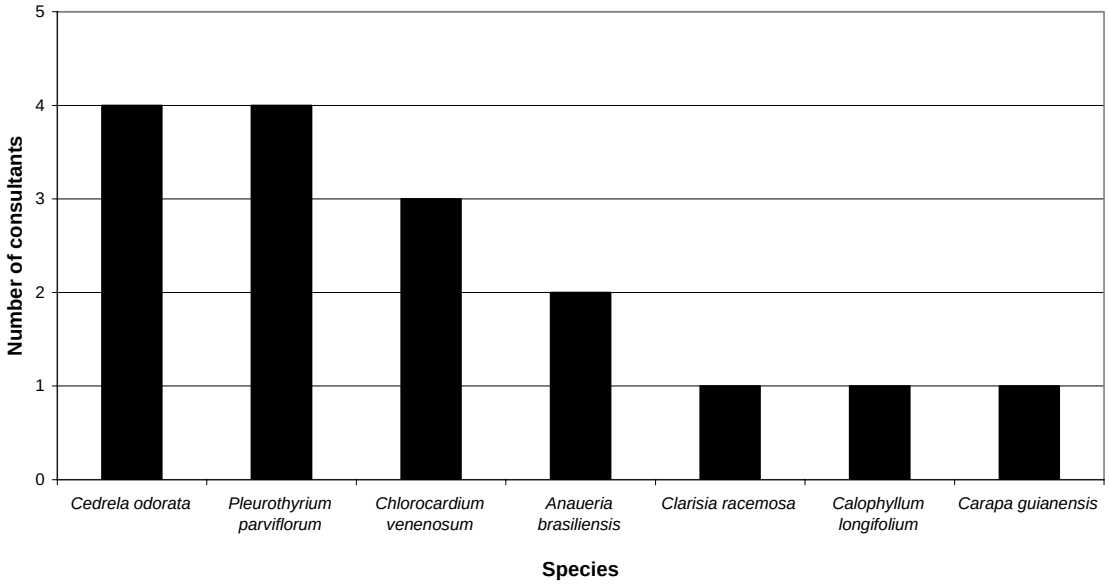


Figure 4-5. Steps in the construction of a dugout canoe (**you**). A. Initial cutting of the felled trunk. B. Removing wood from the sides of the felled trunk. Note the traced shape of the canoe (in black) on the top surface of the felled trunk. C. Continuing to remove wood from the sides of the felled trunk shaping the bow and stern into flattened points. D. Removing wood from the inside of the felled trunk creating a cavity (**you yacu**). Note the use of a **you totecou,** a chisel that is attached to a long pole or handle (All Photos by M. Gilmore).

Figure 4-6. Steps in the construction of a dugout canoe (**you**). A. Flames engulfing the canoe signaling the end of the drying process. B. Opening the canoe with the use of pry bars and wooden braces. C. Removing the charred portion on the inside of the canoe. D. Applying the processed latex of a tree to fix cracks and splits in the canoe. Note the piece of latex soaked cloth that is being stuffed into a crack. E. A finished canoe (All photos by M. Gilmore).

Chapter 5: Epilogue

> "It is one of the frustrations of ethnobotanical exploration. At any place in the hinterland of South America, one could spend a lifetime and not come close to exhausting the reservoir of indigenous knowledge."
> (Davis 1996: 59)

The Maijuna have extensive traditional biological and ecological knowledge. Various portions of this knowledge base have been documented and explained throughout this dissertation. In addition to merely documenting this culturally-based knowledge, an attempt has also been made to explore and examine the significance and importance of this biological and ecological knowledge to the Maijuna. This information helps inform us on how the Maijuna actually perceive and interact with their resources and environment. It is critical to collect this type of data because it is essential in developing culturally relevant and locally driven conservation plans. For example, this information allows conservation practitioners to focus in on those resources that are especially important, significant, and useful to various local populations.

In general, this investigation provides valuable insights into how Amazonian indigenous peoples perceive, use, and interact with their environment. A case in point is the Maijuna habitat classification system. The Maijuna have a complex and detailed habitat classification system identifying more than 70 forest and non-forest habitat types within the Sucusari River basin. They classify habitats based on geomorphology, indicator plant species, physiognomy, disturbance, and indicator animal species. As previously stated, to date little research has been completed on indigenous habitat classification systems (Shepard et al. 2001; Sillitoe 1998) and therefore the results of this study significantly add to our limited knowledge base and understanding of this subject.

Understanding the Maijuna habitat classification system also helps to elucidate habitat diversity on a local scale.

During this investigation into the Maijuna habitat classification system it was determined that all habitats are not of equal importance; some are significant, useful, and important while others are not. Therefore, some habitats identified and classified by the Maijuna could clearly be considered "resource islands" yet others could not. To more fully understand and describe how the Maijuna interact with the habitats found within their current and traditional lands the "avoidance island" concept was introduced, explained, and supported by various examples. This concept is important to more accurately explain and reflect how indigenous and traditional peoples interact with their environment. Solely documenting how people use habitats and resources (as most studies do) provides an incomplete understanding of how they actually perceive and interact with the environment as a whole. To provide a more holistic understanding of how indigenous and traditional peoples perceive and interact with their environment and resources it is necessary to understand how and why they avoid certain areas and resources in addition to how they use them.

Regrettably, one common theme expressed throughout this dissertation is the disintegration and loss of Maijuna traditional knowledge. As with other Amazonian indigenous groups, Maijuna traditional biological and ecological knowledge is rapidly declining. Most Maijuna individuals under the age of approximately 30 do not have an extensive knowledge base of Maijuna traditional biological and ecological knowledge. If this trend is not reversed soon a significant portion of Maijuna traditional knowledge will

be irreversibly lost. This dissertation, however limited, serves to document in some small way a portion of Maijuna traditional knowledge for future Maijuna generations.

On a positive note, leaders from all four Maijuna communities took the initiative to establish the Federación de Comunidades Nativas Maijunas (FECONAMAI) on August 11, 2004 in consultation with and assistance from this researcher. The three main goals of FECONAMAI are to: (1) conserve the Maijuna culture, (2) conserve the environment, and (3) to better organize all four of the Maijuna communities. Although the birth of FECONAMAI could not have been predicted at the onset of this investigation it is perhaps one of the most significant developments to occur during the course of this research project. The establishment of FECONAMAI, even in its infancy, represents an important first step in the Maijuna struggle to meet current and future challenges on their own terms and ultimately take control of their own destiny.

All future research on the traditional biological and ecological knowledge of the Maijuna will be carried out in collaboration with FECONAMAI. The Maijuna recognize and are cognizant of the degradation of their traditional knowledge in general and it is anticipated and envisioned that they will identify research and educational priorities within their communities to counteract this knowledge loss. Working with the Maijuna to address these research and educational priorities will make future investigations truly community driven and collaborative in nature, thus empowering the Maijuna.

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Appendix I. Maijuna ethnocartography: a participatory mapping exercise

Participatory mapping consists of encouraging local people to produce maps of their lands, including information such as land use data, resource distributions, and culturally significant sites, among other things (Smith 1995). These maps ultimately represent how local people perceive their lands and resources, and therefore represent their cognitive maps. Participatory mapping techniques were utilized during this study to provide a better understanding of how the Maijuna of Sucusari perceive, value, and interact with their resources and communal lands.

In addition, the map produced during this research project also provides the Maijuna of Sucusari with certain long-term benefits. For example, various copies of this map will be given to the Sucusari community upon return to Peru. The map is to be displayed in the community school to teach Maijuna children the geographic and traditional knowledge embedded within it. Most Maijuna individuals under the age of approximately 30 years old do not know the Maijuna names of the various rivers, streams, and other culturally important places and sites within the Sucusari River basin. Therefore, this map can serve as a critical and much needed teaching tool. This map and the data contained therein can also be used to establish the boundaries of occupied land, both past and present, form the basis of land claims, and defend Maijuna lands from non-native incursions (Chapin and Threlkeld 2001; Arvelo-Jiménez and Conn 1995; Neitschmann 1995; Poole 1995; among others).

It is important to note that two different versions of the map produced during this investigation will be provided to the Maijuna of Sucusari. At the request of Maijuna consultants one version of this map will contain *all* of the information designated on the

original map produced while the other version will be altered to omit information that they consider and have designated as culturally sensitive and important (e.g. fishing (**yadibai baidadi**) and hunting areas (**bai baidadi**), animal mineral licks (**tuada**), etc.). According to consultants, the map with the culturally sensitive and important information will only be available to Maijuna individuals and therefore it will not be displayed in the community school for local outsiders to see. Although verbal consent was received to publish this map in its entirety, the map reproduced here (Figure I-1B) does not contain any information that the Maijuna of Sucusari designated as culturally sensitive and important. This was done to err on the side of caution and to fully protect the intellectual property of the Maijuna. A close-up of the map legend (Figure I-1A) has been reproduced in its entirety to provide the reader with an idea of the type of information that is included in the original map.

The map presented here was developed over a four day period during late July, 2004 in consultation with seven Maijuna consultants (five males and two females ranging in age from approximately 50 to 78 years old) (Figure I-2) that were previously interviewed about the Maijuna habitat classification system. These individuals were chosen for this portion of the study because they had extensive knowledge of the subject matter and were willing to participate. In addition to the above mentioned individuals, a 25 year old Maijuna male participated in half of the mapping sessions to assist with physically drawing the map, among other things. Mapping was generally done in the morning and both breakfast and lunch were provided to participants; this is very similar to the structure of *mingas* or communal work parties that the Maijuna use to clear swiddens, collect *Lepidocaryum tenue* Mart. leaves, etc.

At the beginning of this mapping exercise, the objectives and methods of participatory mapping were explained to all consultants, including a discussion of the potential pros and cons of this type of research (Chapin and Threlkeld 2001). Several examples of completed maps produced in other studies were also provided to the Maijuna (Kalibo 2004) so that they would further understand the process and potential end results of participatory mapping.

This mapping exercise started with Maijuna consultants drawing the Sucusari River followed by the smaller streams, rivers, and lakes found throughout the Sucusari River basin. The direction and form of the Sucusari River is more or less exact (at least, as the Maijuna perceive it to be) whereas the form and direction of its tributaries are approximate. After sketching the rivers and lakes of the Sucusari River basin, consultants were then asked to locate and map both old and new house sites and swiddens, and other important cultural features, on the map. Because of a lack of space, the main Maijuna community was designated on the map as a whole instead of locating and designating individual houses within the community. The same is true for the location of swiddens. Due to space constraints, the symbol for swiddens, both old and new, represents a zone or area that may contain various swiddens and not just one.

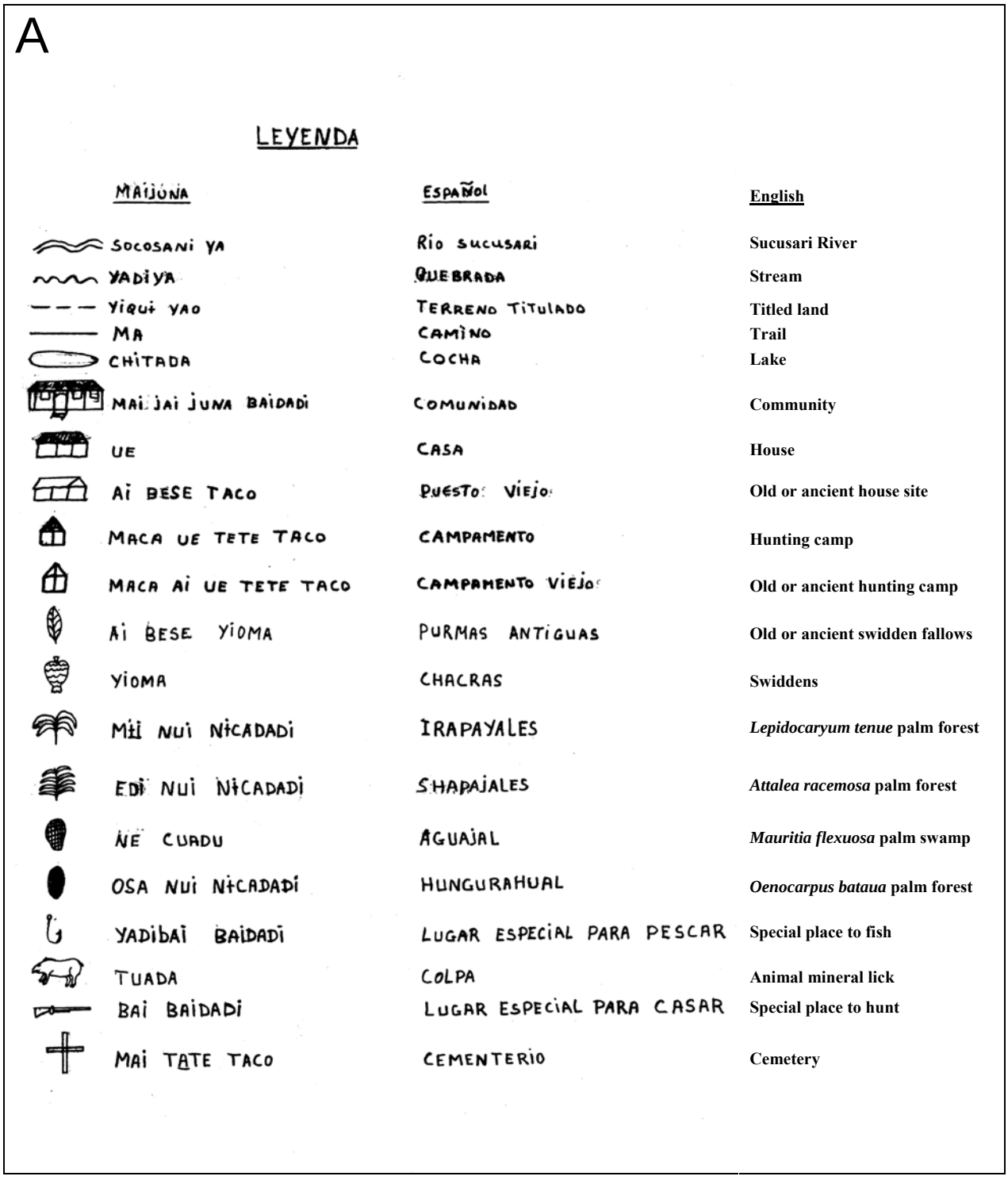
In addition to mapping these features, Maijuna consultants were also asked to identify, map, and name the different hunting, fishing, and plant collecting sites, both old and new, that they deemed important. The symbols designating *L. tenue* (**mi̲i̲ nui nɨcadadi**), *Oenocarpus bataua* Mart. (**osa nui nɨcadadi**), and *Attalea racemosa* Spruce (**edi nui nɨcadadi**) palm forests represent general zones or areas where these forests are located and therefore they may actually represent one or more distinct palm forests. The

Mauritia flexuosa L. f. palm forests (**ne cuadu**) and animal mineral licks (**tuada**) designated on this map are different because they in fact represent single habitats. The fishing (**yadibai baidadi**) and hunting areas (**bai baidadi**) that are designated on the map are areas that, according to consultants, have high concentrations of fish and game animals, respectively. Although the Maijuna may target these specific areas for fishing and hunting, they also fish and hunt in other places throughout the Sucusari River basin.

This map is entirely a creation of the Maijuna. Apart from asking questions and giving general advice and support, the only other assistance that was provided was to draw the line that delineates their titled land. This was done at the request and under the direction of the Maijuna consultants that participated in this participatory mapping exercise. In addition to the places designated on this map, there are also a number of places that only have Spanish names within the Sucusari River basin. Maijuna consultants did not want to designate and include these areas on this map because they wanted this "to be a Maijuna map and not a mestizo map."

Figure I-1. Results of the Maijuna participatory mapping sessions held in late July, 2004. A. Close-up of the Maijuna map legend in its entirety with English translations. B. The Maijuna map excluding those areas that the Maijuna designated as culturally significant and important. This map represents a compilation of 5 pieces of easel paper positioned end to end (each piece of easel paper is 68 x 82 cm).

A



B

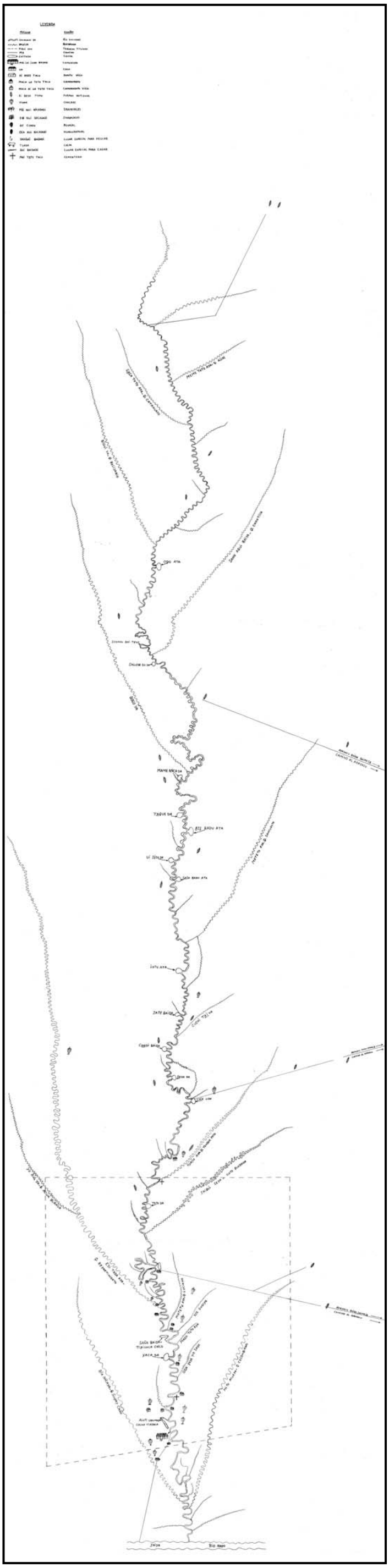


Figure I-2. Maijuna consultants drawing a map of the Sucusari River basin.

Appendix II. The Maijuna version of **Ma bajɨde quɨija** (‘The story of **Ma bajɨ**’).

[1]Ue unu yuaco. [2]Igue, chichibɨ junaca bejɨ botata ani oco. [3]Na ode monɨde beco yuaco. [4]Ma bajɨ tea, tea ini etajoguɨ. [5]Sade, sade baquɨ mañaco taco debajoguɨ. [6]Jaɨdɨ beoquɨ ojɨ. [7]Ai ñi nede ao oico. [8]Bichide jiyejani daquɨde ñameco bɨocona ja ico. [9]Queta, toto aquɨ anita caɨnade daquɨde bɨoquɨna ja ico. [10]Iguedeca, oico jana bichi toto aquɨde ijachi na daquɨde ñameco. [11]Igueta, mɨde micabɨ jiyo jai cachi daquɨde ñameco bɨo bɨomɨade sa acueyo oco. [12]Mɨ cama ico ani mɨaconade oida. [13]Ɨ jacode oiyi. [14]Ñata sayi ñiajɨ oico, oico ani ojɨ. [15]Saguɨ asade mɨacona ɨdadi baiyi cacama ijɨ. [16]Ɨdadi bequɨ ɨteyi, jete juadai yide. [17]Saicode bɨaco jiaco chibaco. [18]Yibago ñi daico, yibago ñi daico. [19]Mɨi tada mɨicode da jɨcaco, mai, mai acode ba, mai acode ba. [20]Ma bajɨ mai aɨ bajaye. [21]Mɨ ñiaco baco debade, mɨ ñiaco baco ti jɨca anico eja ojɨ nɨjode ojɨ. [22]O sujɨde beco, beco naijoco naijoquɨde. [23]Toa tou ja, cuacodo ja, o oja ichigode daico. [24]Daico, daico… daico ico ɨjɨde. [25]Maca judu caca jaiquɨ jɨca asajɨ, mɨacona quima ijɨde asade yi. [26]Jɨcamago, yibago ñi daico chibago. [27]Yi cama asamadeca yi. [28]Mai nama acode bama, ma bajɨ, ma bajɨ oaquɨna ja, oaquɨbɨ bayi. [29]Mai aɨ bajaye ɨjɨde asadeca yi. [30]O ñiaguɨ, jana mɨ monɨ oimayi mɨde. [31]Oquɨ abɨ naɨ utajoguɨ, naɨ utajode tea beo bese nejoguɨ. [32]Bɨaco na jiaco yibago najo ñi daico. [33]Mɨ jɨcacode asade maitaquɨde daiyi ico quɨaco… [34]Ñi doiquɨde neade jaɨdɨ tani ɨmede beco uja daico. [35]Tepe ñoa daico tɨni sanijogo. [36]Casoa ja.