strategic partnerships have helped FECONAMAI work towards the realization of their strategic work plans and goals. I anticipate that FECONAMAI will continue to work with these partners and seek out additional key institutional collaborators and allies as they continue to work toward their principle organizational goals of environmental conservation, cultural conservation, and community organization.

According to Romero Ríos-Ushiñahua (pers. comm. 2009), the current president of FECONAMAI and a founding member of the federation, out of all of the issues and initiatives that FECONAMAI has worked on to date, the Maijuna consider the creation of an ACR that would legally and formally protect their ancestral lands in perpetuity their number one goal and priority. The idea to conserve their ancestral lands originally came from the Maijuna themselves and they have been working nonstop to realize this objective. In short, they strongly feel that their survival as a people and the survival and maintenance of their cultural practices, unique traditions, and traditional subsistence strategies depend on a healthy, intact, and protected ecosystem.

In fact, this belief by the Maijuna is supported scientifically. For example, it has been found that as indigenous peoples are forced to live in unprotected areas with degraded ecosystems and biodiversity, or are removed from their traditional territories, cultural practices that rely on such diversity begin to lose relevance and the intergenerational transmission of such knowledge begins to breakdown. As this occurs, cultural practices, such as traditional resource-use strategies and management practices that once maintained or fostered biological diversity, are often replaced by other activities that are biologically and environmentally unsound (Maffi 2001). In short, this highlights the inextricable link and interdependence that exists between both biological and cultural diversity, and reinforces the necessity of protecting Maijuna traditional lands if their cultural traditions and beliefs are to persist—and vice versa.

In summary, FECONAMAI is a critically important macro-level institution that officially and legally promotes and represents the cultural, biological, and political interests of all four Maijuna communities. As revealed by its principle organizational goals, it is strongly committed to the conservation of Maijuna cultural traditions and the ecological integrity of Maijuna ancestral territory with its associated biological diversity and resources. Ultimately, FECONAMAI is a key sociocultural asset whose core values, goals, and organizational structure and capacity are strongly compatible with the sustainable use and management of the proposed ACR Maijuna.

THE MAIJUNA PARTICIPATORY MAPPING PROJECT: MAPPING THE PAST AND THE PRESENT FOR THE FUTURE

Authors: Michael P. Gilmore and Jason C. Young

INTRODUCTION

Participatory mapping consists of encouraging local people to draw maps of their lands that include information such as land-use data, resource distributions, and culturally significant sites, among other things (Smith 1995; Herlihy and Knapp 2003; Corbett and Rambaldi 2009). These maps ultimately depict how they perceive their lands and resources, and therefore represent their cognitive maps. Participatory mapping has been successfully used by indigenous and traditional communities throughout the world for a variety of reasons: to illustrate customary land-use systems and management strategies (Sirait 1994; Chapin and Threlkeld 2001; Gordon et al. 2003; Smith 2003); to gather and guard traditional knowledge (Poole 1995; Chapin and Threlkeld 2001); to set priorities for resource-management plans (Jarvis and Stearman 1995; Poole 1995; Chapin and Threlkeld 2001); and to establish the boundaries of occupied land (both past and present), form the basis of land claims, and defend community lands from incursions by outsiders (Arvelo-Jiménez and Conn 1995; Neitschmann 1995; Poole 1995; Chapin and Threlkeld 2001). Perhaps most importantly, participatory mapping also has been shown to empower communities, improve cultural and community cohesion, and help foster the transfer of knowledge from older to younger community members (Flavelle 1995; Sparke 1998; Chapin and Threlkeld 2001; Gilmore and Young pers. obs.).

In this chapter, we describe in detail a participatory-mapping project that we carried out in four Maijuna communities in the northeastern Peruvian Amazon. We used participatory-mapping techniques to provide an informed understanding of how each of the Maijuna communities perceives, values, and interacts with their titled and ancestral lands and the biological and cultural resources contained therein.

METHODS

Field research for this study was completed during four field seasons between 2004 and 2009. All research took place in the Maijuna communities of Puerto Huamán and Nueva Vida along the Yanayacu River, San Pablo de Totoya (Totolla) along the Algodón River, and Sucusari along the Sucusari River, each of which is found in the northeastern Peruvian Amazon (Fig. 2A). We began the participatory-mapping work in each of these Maijuna communities by explaining the objectives and methods of the participatory-mapping exercises, including a discussion of the potential pros and cons of this type of research (Chapin and Threlkeld 2001). In addition, several examples of completed maps produced in other studies were provided to the Maijuna (Kalibo 2004) so that they would further understand the process and potential end results of the research project.

After receiving community input and consent, participatory-mapping exercises in each community commenced with Maijuna participants drawing the hydrological features of the watersheds that they inhabit, including key features such as the rivers, streams, and lakes. After this base map was produced and agreed upon by consensus, participants were then asked to identify, locate, and map biological and cultural sites that they deem important, such as old and new house sites and swiddens and the various hunting, fishing, and plant collecting sites that they visit. These specific methods are a modified version of those described by Chapin and Threlkeld (2001).

Mapping sessions typically lasted for several days. 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 palm (*Lepidocaryum tenue*) leaves, build canoes, etc. (Gilmore et al. 2002; Gilmore 2005). In addition, the Maijuna participants of these mapping sessions consisted of both males and females, and individuals of all ages, ensuring that a variety of perspectives, voices, and expertise were included in the maps, and making them truly representative of the communities themselves.

After completing each map, a team of Maijuna individuals was then selected in each community to work with the researchers to fix the location of as many of the identified sites as possible using hand-held GPS (Global Positioning System) units (Sirait et al. 1994; Chapin and Threlkeld 2001). Importantly, Maijuna team members included individuals well known in their respective communities for their expertise in traditional cultural, biological, ecological, and geographical knowledge. Physically visiting and fixing the locations of the identified sites generally required each of the field teams to travel hundreds of kilometers by both river and foot for several weeks at a time within their respective river basins. Upon returning from the field, the researchers utilized ESRI's ArcGIS, a geographic information systems (GIS) software package, to integrate, organize, analyze, and spatially represent all of the data collected (Sirait et al. 1994; Scott 1995; Duncan 2006; Corbett and Rambaldi 2009; Elwood 2009). Geographers have widely used GIS software to "integrate local and indigenous knowledge with 'expert' data" and thereby confer scientific legitimacy to participatory maps (Dunn 2007: 619).

Data presented in this chapter comprise only a small portion of the overall data collected and research conducted. For example, key and detailed information pertaining to the ethnohistory, resource-use strategies, and traditional stories for each site was also documented via ethnographic-interviewing techniques and recorded using voice recorders, cameras, and video cameras. All of this information is being used to develop a multimedia participatory GIS database that will ultimately serve as a reservoir of Maijuna traditional knowledge and beliefs regarding their ancestral lands and the biocultural resources found within them.

RESULTS AND DISCUSSION

Each of the four Maijuna communities sketched detailed and comprehensive maps of their respective titled and traditional lands (e.g., Fig. 24), which were then used by the field teams as guides to locate and fix the geographical coordinates of over 900 culturally and biologically significant sites within the Sucusari, Yanayacu, and Algodón river basins. These culturally and biologically significant sites have been organized into ten different categories, for ease of data analysis and clarity of display, and they have been mapped using ArcGIS to spatially represent the data (Fig. 25). These categories of biologically and culturally significant sites are: Maijuna communities, fields (up to 30 years old), cemeteries, historical sites, battle sites, non-timber resource sites, animal mineral licks (hunting sites), special fishing zones, special hunting zones, and hunting or fishing camps. Each of these categories will be explained in detail along with a discussion of its importance in terms of understanding how the Maijuna perceive, value, and interact with their lands and biocultural resources.

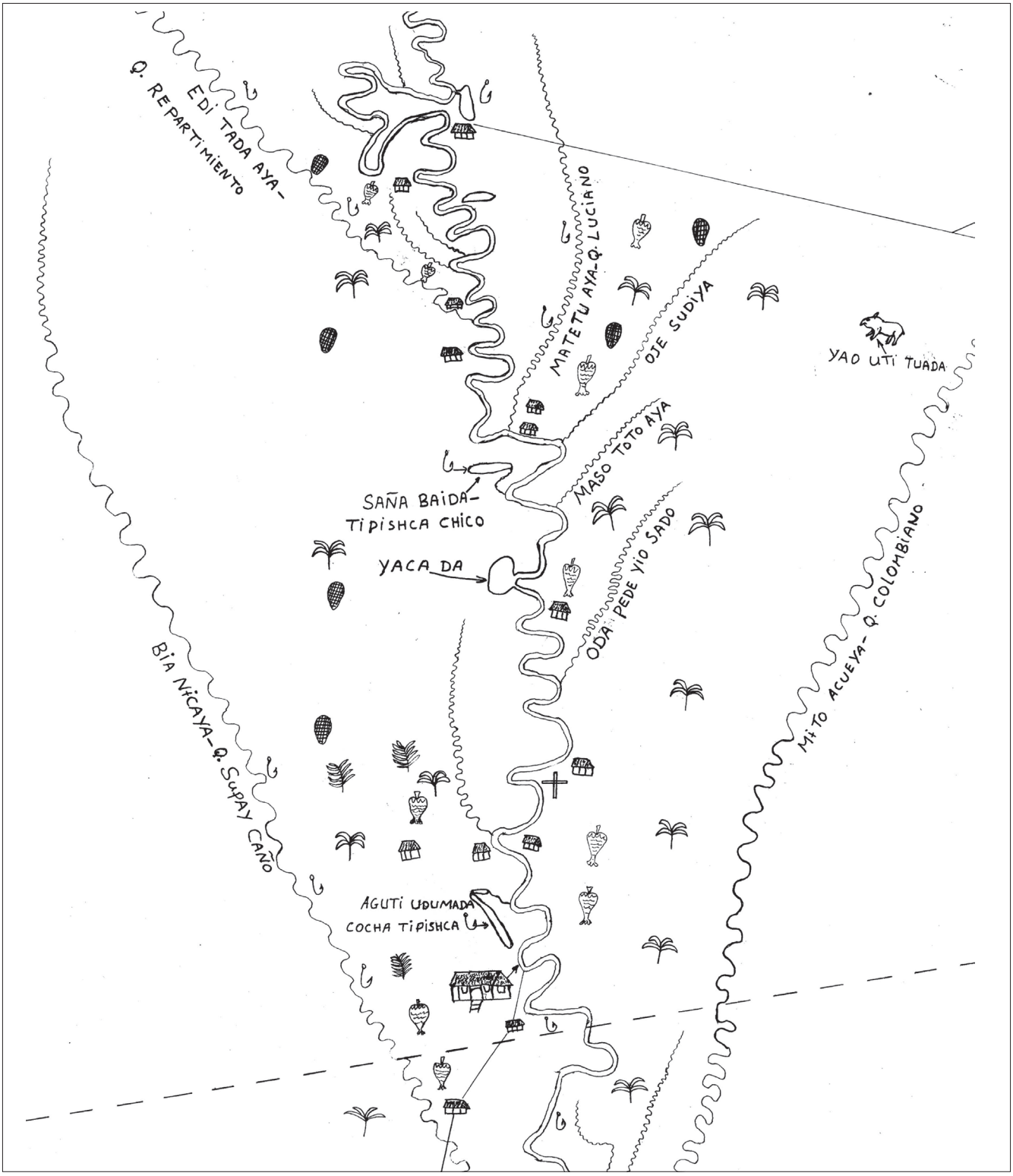
Not surprisingly, one of the first things that each Maijuna community did when mapping their titled and traditional lands was to identify the location of their respective community. This ultimately helped them to anchor and orient themselves throughout the rest of the mapping exercise. Puerto Huamán and Nueva Vida are located along the Yanayacu River, San Pablo de Totoya (Totolla) along the Algodón, and Sucusari along the Sucusari (Fig. 25). These communities are relatively young in terms of the overall history of the Maijuna. Puerto Huamán was founded in 1963, San Pablo de Totoya (Totolla) in 1968, Sucusari in 1978, and Nueva Vida in 1986. This is because the Maijuna traditionally lived in interfluvial regions toward the headwaters of the Sucusari, Yanayacu, and Algodóncillo rivers, and only after the 1930s moved downstream to where they eventually formed their current communities (see chapter titled "The Maijuna: Past, Present and Future" for more detailed information).

In addition to mapping their communities, Maijuna consultants also identified fields (up to 30 years old) and cemeteries found within their titled and traditional lands (Figs. 24, 25). The clearing, use, and existence of cemeteries, called *mai t̲ate taco*[1] by the Maijuna, is a somewhat recent and nontraditional phenomenon as Maijuna ancestors burned their dead in funerary pyres (Gilmore 2005). In regards to the fields of less than 30 years of age, over one hundred and forty of these sites were identified, located, and had their geographical coordinates fixed within the three river basins throughout the course of this project. It is not surprising that both these fields and the cemeteries are located relatively close to present day Maijuna communities (Fig. 25).

All fields that were deemed older than 30 years in age were classified and displayed via ArcGIS separately as historical sites (Fig. 25) because of their age, stage of succession, and the fact that the Maijuna themselves classify and name these areas differently than younger swiddens and fallows. Notably the Maijuna classify and name old swidden fallows with mature secondary forest as *ai bese yio* ("ancient or old swidden") or *doe bese yio* ("ancient previous swidden"). These swidden fallows of Maijuna elders and ancestors are identified and located by the present day Maijuna based on oral history, memory, and characteristic plant species such as *maqui ñi* (*Cecropia* spp.), *edo ñi* (*Croton palanostigma*), *yibi ñi* (*Ochroma pyramidale*), *maso ñi* (*Ficus insipida*), *i̲tayo ñi* (*Miconia minutiflora*), *jati ñi* (*Xylopia sericea*), *neaca̲ ñi* (*Guatteria latipetala*), and *suña eo* (*Lonchocarpus nicou*) (Gilmore 2005). For ease of data analysis and clarity of display, old Maijuna house sites and old hunting or fishing camp sites were also classified and mapped in ArcGIS as historical sites along with old fields (Fig. 25). Importantly, the Maijuna themselves recognize the distinction between old and new house sites and camps and, similar to old fields, both are identified and located based on oral history, memory, indicator plant species, and/or the presence of pottery shards.

1 Transcription of Maijuna words was accomplished with the help of S. Ríos Ochoa, a bilingual and literate Maijuna individual, using a practical orthography previously established by Velie (1981). The practical orthography developed by Velie 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 *i* 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 word's meaning is not clarified by its context. 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*, and *ɨ̲*.

Fig. 24. Results of the Maijuna participatory mapping sessions held in late July 2004. On the left, a portion of the map (the entire map is a compilation of five pieces of easel paper, each 68 by 82 cm, positioned end to end). On the right, a close-up of the map legend in its entirety, with English translations added.



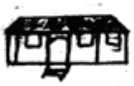
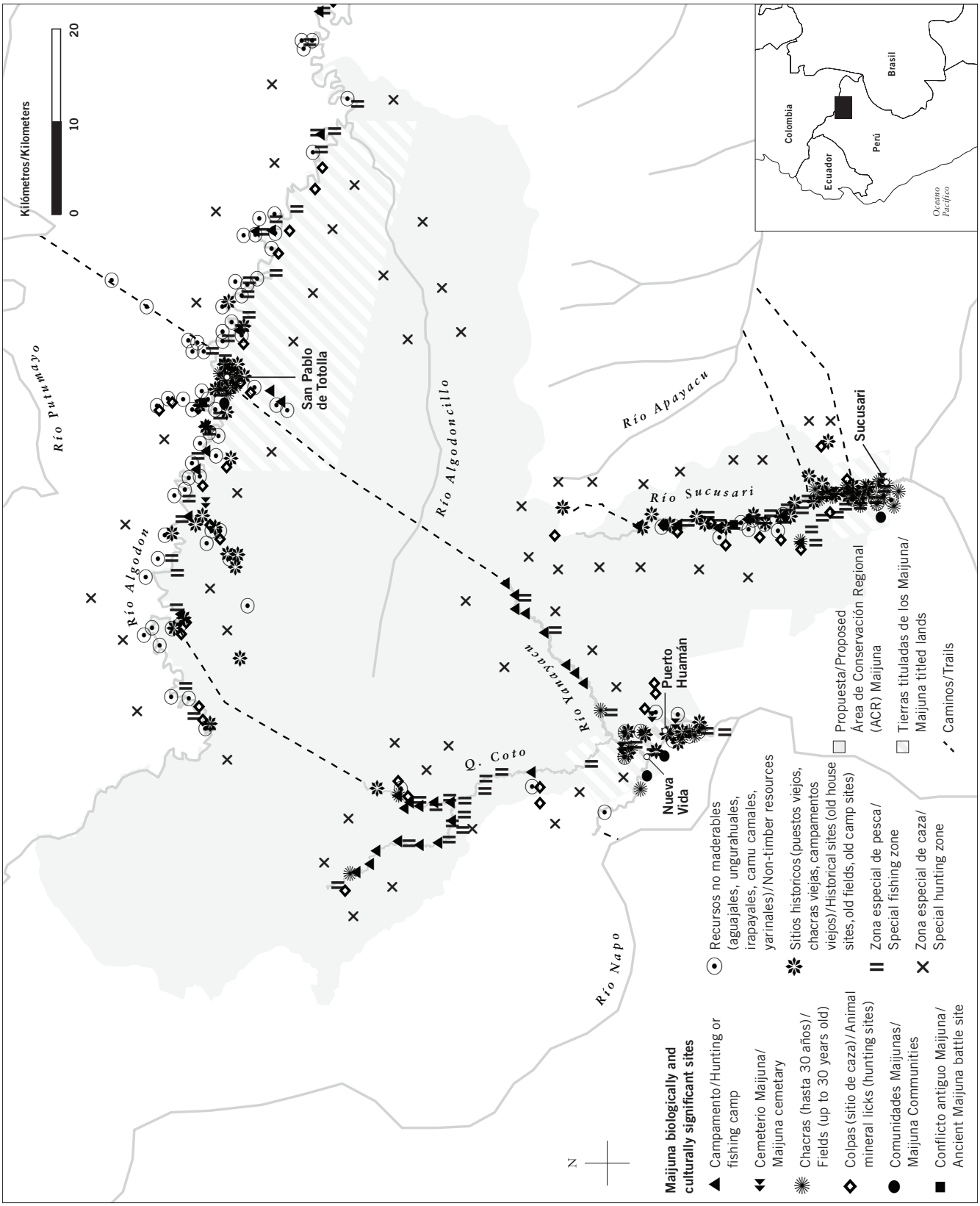
	Maijuna	Castellano	English
	*Socosani Ya*	*Río Sucusari*	Sucusari River
	*Yadi ya*	*Quebrada*	Stream
	Yiqui yao	*Terreno titulado*	Titled land
	Ma	*Camino*	Trail
	*Chitada*	*Cocha*	Lake
	*Mai jai juna baidadi*	*Comunidad*	Community
	*Ue*	*Casa*	House
	*Ai bese taco*	*Puesto viejo*	Old or ancient house site
	*Maca ue tete taco*	*Campamento*	Hunting camp
	*Maca ai ue tete taco*	*Campamento viejo*	Old or ancient hunting camp
	*Ai bese yioma*	*Purma antigua*	Old or ancient swidden fallow
	Yioma	*Chacra*	Swidden
	*Mɨi nui nicadadi*	*Irapayal*	*Lepidocaryum tenue* palm forest
	*Edi nui nicadadi*	*Shapajal*	*Attalea racemosa* palm forest
	*Ne cuadu*	*Aguajal*	*Mauritia flexuosa* palm swamp
	*Osa nui nicadadi*	*Ungurahual*	*Oenocarpus bataua* palm forest
	*Yadidbai baidadi*	*Lugar especial para pescar*	Special place to fish
	*Tuada*	*Colpa*	Animal mineral lick
	*Bai baidadi*	*Lugar especial para casar*	Special place to hunt
	*Mai tate taco*	*Cementerio*	Cemetery

Fig. 25. Map highlighting over 900 culturally and biologically significant sites to the Maijuna of the Sucusari, Yanayacu, and Algodón river basins.



In total, over one hundred and sixty historical sites were identified, located, and had their geographical coordinates fixed throughout the course of this research project. It is critically important to note that this number ultimately represents a small portion of all of the Maijuna historical sites within the Sucusari, Yanayacu, and Algodón river basins. This is due to the fact that many of these sites are incredibly remote and it was not possible to visit all of them within the time frame allotted. In addition, many of the exact locations of these sites (we only geographically fixed exact and specific locations) have been lost over historical time because the Maijuna have an oral, not written, culture and they do not currently live in, and rarely travel to, the regions where their ancestors previously lived. Therefore, there is a limit to the amount of detailed knowledge regarding historical sites maintained by the Maijuna.

Another collection of culturally significant sites that were also identified, fixed, and grouped together include three Maijuna battle sites (Fig. 25). According to Maijuna consultants, these mark the locations of ancient battles between Maijuna ancestors and hostile outsiders (e.g., colonists or soldiers). Interestingly, it was consistently and unanimously stated that the Maijuna were victorious in each one of these bloody encounters. These areas were categorized and mapped in ArcGIS separately from the other historical sites due to their uniqueness and the importance that the Maijuna place on these locations.

Within the three river basins, over 130 non-timber resource sites were identified, located, and had their geographical coordinates fixed (Fig. 25). These sites include, *Mauritia flexuosa* palm swamps (*ne cuadu* in Maijuna; *aguajales* in Spanish), forests with an understory dominated by the palm *Lepidocaryum tenue* (*mɨɨbɨ* or *mɨɨ nui nɨcadadi; irapayales*), forests dominated by the palm *Oenocarpus bataua* (*bosa nui nɨcadadi* or *osa nui nɨcadadi; hungurahuales* or *ungurahuales*), forests with an understory dominated by the palm *Phytelephas macrocarpa* (*mɨɨbɨ* or *mɨɨ nui nɨcadadi*; *yarinales*), and riverside areas dominated by the plant *Myrciaria dubia* (*atame nui nɨcadadi*; *camu camales*). All of these sites correspond to Maijuna named and classified habitat types (as indicated by the names above) and all of the plant species that dominate these habitat types are useful to the Maijuna in different ways and at different times of the year, both culturally and economically (Table 11) (Gilmore 2005).

Over 40 animal mineral licks, called *tuada* or *onobɨ* in Maijuna and *colpas*[2] in the local Spanish dialect, were also identified and visited within the Sucusari, Yanayacu, and Algodón river basins (Figs. 24, 25). Animal mineral licks are incredibly important both culturally and economically to the Maijuna because a number of mammal and bird species visit these sites year round during both day and night. According to Maijuna consultants, nine different animal and bird species are encountered and hunted in these areas (Table 12). Notably, the vast majority of animal mineral licks located within Maijuna titled and traditional lands have proper Maijuna names. The Maijuna name animal mineral licks after people, plants, animals, and hunting dogs, among other things (Gilmore 2005). The extensive naming of animal mineral licks is ultimately a sign of and testament to their importance to the Maijuna.

In addition to mapping specific hunting sites, the Maijuna also more broadly identified special hunting zones (*bai baidadi*) that they visit (Figs. 24, 25). Instead of being specific geographical points like the animal mineral licks, these are broader areas targeted for hunting because they are known to have high concentrations of game animals. The same holds true for special fishing zones (*yadibai baidadi*), which are targeted for their high concentrations of culturally and economically important fish species (Figs. 24, 25).

Although the Maijuna may target these special hunting and fishing zones, they also hunt and fish a considerable amount in other less desirable areas throughout their titled and ancestral lands. This is because many of these special hunting and fishing zones are located in remote areas generally towards the headwaters of rivers and streams. This should be of no surprise because the more remote an area is the less hunting and fishing pressure that it experiences, allowing mammal, bird, and fish populations to more readily flourish.

2 Also spelled as *collpas*.

Table 11. Ethnobotanical information for plant species dominant at non-timber resource sites that were mapped, located, and had their geographical coordinates fixed within the Sucusari, Yanayacu, and Algodón river basins (Gilmore 2005).

Species	Maijuna name	Spanish name	Use	Harvesting method	Time of harvest[a]
Lepidocaryum tenue Mart. (Arecaceae)	*mii ñi*	*irapay*	**leaves:** thatch for houses (this is the most popular and important plant for thatch and is occasionally sold)	not felled (except when tall)	year round
Mauritia flexuosa L.f. (Arecaceae)	*ne ñi*	*aguaje*	**fruits:** edible, also used to make a beverage and processed into an oil; fruits occasionally sold	climbed, felled, collected on ground	~May–August
			fruits: pieces used as fishing bait	as above	as above
			leaves: use old, dry leaves as a fuel for drying canoes and starting fires in newly cleared and dried agricultural fields	old and hanging leaves cut 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	felled to promote larval growth (larvae also grow on natural tree falls)	year round
Oenocarpus bataua Mart. (Arecaceae)	*bosa ñi, osa ñi*	*hungurahui, ungurahui*	**fruits:** edible, also used to make a beverage and processed into an oil; fruits occasionally sold	climbed, felled, or collected from ground	~November-March and June–August
			fruits (unripe): processed into a medicine (for tuberculosis)	climbed, felled	~year round
			leaves: used to make temporary baskets	not felled (harvested from small plants)	year round
			leaves: thatch for temporary shelters	not felled (except when tall)	year round
			trunk: hosts a beetle larva that is eaten and used as fishing bait	felled 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[b]	not felled	year round
			leaf-base fibers: used as kindling[b]	felled	year round
Phytelephas macrocarpa Ruiz & Pav.(Arecaceae)	*mii ñi*	*yarina*	**fruits:** edible (liquid, immature endosperm)	picked, felled	year round
			leaves: thatch for temporary shelters and the ridges of roofs	not felled (except when tall)	year round
			fruits: the hard endosperm collected and sold as a source of vegetable ivory	collected from ground	year round
Myrciaria dubia (Kunth) McVaugh (Myrtaceae)	*atame ñi*	*camu camu*	**fruits:** edible, fruits occasionally eaten and used to make a beverage; fruits rarely, if ever, sold	picked	unknown

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

b Not currently used in this way by the Maijuna.

Table 12. Birds and mammals encountered and killed by the Maijuna at mineral licks used by animals within the Sucusari, Yanayacu, and Algodón river basins (Gilmore 2005).

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

Therefore, many Maijuna families currently maintain hunting and fishing camps (*maca ue tete taco*) in these remote areas, which they visit for extended periods to provide easier access to these highly valued resources. Over 40 currently used hunting and fishing camps were identified (Fig. 25).

CONCLUSIONS

Over 900 biologically and culturally significant Maijuna sites were identified, visited, and geographically fixed within the Sucusari, Yanayacu, and Algodón river basins during this participatory-mapping project, highlighting the highly detailed and extensive traditional knowledge that the Maijuna have regarding their ancestral lands. Combined with historical documents, anthropological research, and Maijuna oral traditions, this information irrefutably supports the claim that the proposed ACR is made up of Maijuna ancestral territory.

The maps produced during this study also facilitate a better understanding of how the Maijuna perceive, interact with, and value their titled and ancestral lands and the biocultural resources found within them; and they can be used to facilitate the conservation and management of the proposed ACR. For example, knowledge of the spatial use of resources and habitats (Figs. 24, 25), including how and when they are utilized (Tables 11 and 12), is critically important because it can be used to establish resource management plans and strategies for the proposed ACR Maijuna.

RECOMMENDATIONS

The following three courses of action will facilitate the conservation and management of the proposed ACR and will help to validate and empower the Maijuna communities. We strongly feel that these recommendations, if followed, will ultimately help to ensure the long term success of the proposed ACR Maijuna and the maintenance of its biocultural diversity.

- The results and ArcGIS map (Fig. 25) of this project should be used to ensure that the final boundaries of the proposed ACR accurately reflect the spatial resource-use patterns and cultural history of the Maijuna within the Sucusari, Algodón, and Yanayacu watersheds. In addition, as many of the biologically and culturally significant sites mapped by the Maijuna as possible should be included within the proposed ACR.
- The results and ArcGIS map of this project should be utilized to help establish resource-management plans and strategies because they contain critical information concerning the spatial distribution and temporal use of culturally, biologically, and economically important resources.
- The central core of Maijuna ancestral lands—where the headwaters of the Sucusari, Yanayacu, and Algodóncillo rivers meet—should receive the strictest possible protection. The Maijuna rarely enter and use this area (Figs. 2A, 9D, 25) and it can serve as an important breeding ground and "source area" for ecologically, economically, and culturally important plant and animal species. Significantly, this is the same area where high-terrace habitats were identified during this inventory (see chapter on Flora and Vegetation), so a strict level of protection also would protect unique and previously unknown types of vegetation.

HUMAN COMMUNITIES: CONSERVATION TARGETS, ASSETS, THREATS, AND RECOMMENDATIONS

Author: Alberto Chirif

INTRODUCTION

In view of the information presented in the previous three chapters, I list here conservation targets, assets, threats, and recommendations for the Maijuna and other human communities associated with the proposed Área de Conservación Regional Maijuna.

CONSERVATION TARGETS

These are the most critical targets for the conservation of human communities in the proposed ACR Maijuna: