sociedade & natureza

DOI: 10.14393/SN-v36-2024-71004x
Receveid: October 04, 2023 | Accepted: February 15, 2024 | Published: April 18, 2024

Papers

Traditional Territory in a Protected Area: Territorial Dynamics and Wildlife Management in the Amanã Sustainable Development Reserve, Amazonas, Brazil

Luiz Francisco Loureiro[1]
Lísley Pereira Lemos Nogueira Gomes[2]
Caetano Lucas Borges Franco[3]
Carlos Frederico Alves de Vasconcelos Neto[4]
João Valsecchi [5]

Keywords
Subsistence hunting
Territoriality
Traditional community
Amazon

Abstract
Implementing sustainable management strategies for common-use resources influences traditional peoples' and communities' territorialization processes. This article aims to provide historical context on the use of natural resources in the Amanã Lake region, Maraã, Amazonas, Brazil. It also seeks to describe the territorial boundaries and hunting areas of one riverine community, presenting a proposal for establishing a sustainable management plan for subsistence hunting. Data covered a fifty-year period and were obtained through semi-structured interviews, systematic mapping of hunting locations, and participatory mapping of natural resource use in the region. The proposed take and no-take zones for wildlife management were based on previously established models in the region and on discussions with the villagers. Over the studied period, two territorial perspectives were identified, and their co-occurrence has had significant impacts on the territoriality of the community. The hunting area used by villagers decreased as its designated use area did, but at a different pace. This shift led to overlaps and conflicts over resource use. The proposed spatial wildlife management plan (area of 22,216.22 ha) was considered appropriate by the villagers, but there is still a need to develop this strategy based on local territorialities.

[1] Instituto de Desenvolvimento Sustentável Mamirauá - IDSM, Tefé, AM, Brazil. luiz.loureiro@mamiraua.org.br
[2] Virginia Polytechnic Institute and State University - VT, Blacksburg, VA, United States. lisley@vt.edu
[3] Instituto de Desenvolvimento Sustentável Mamirauá - IDSM, Tefé, AM, Brazil. caetano@mamiraua.org.br
[4] Instituto de Desenvolvimento Sustentável Mamirauá - IDSM, Tefé, AM, Brazil. fredvasconcelosnt@gmail.com
[5] Instituto de Desenvolvimento Sustentável Mamirauá - IDSM, Tefé, AM, Brazil. joao.valsecchi@mamiraua.org.br

INTRODUCTION

The design and implementation of environmental governance strategies that exclude local people and indigenous communities threaten the health of ecosystems and the territorialities of these groups (Brondizio; Le Tourneau, 2016). When intervening in processes of identity and mobilization in traditionally occupied lands (Almeida, 2004), territorial planning proposed and/or implemented by the government raises two important issues: i) dominant organizational structure introduced by the state that neglects and delegitimizes traditional territorialities (Little, 2002); and ii) public policies that ignore the rules established by resource users disregard local institutional capital (Ostrom, 2002).

Even initiatives that seek to consider local communities also impact traditional territorialities. An example of this is the experience observed in Xapuri, Acre, Brazil when, following the establishment of an Agroextractive Settlement Project, an individual approach was introduced in an area shared by 68 families (Le Tourneau; Beaufort, 2017). Thus, local rules of access to resources shifted from systems based on customary rights to models defined by the state authority (Ribot; Peluso, 2003).

Considering the relationships between the users and the resources involved in different territorial dynamics is key. An example is the role of wildlife as food in Amazonian rural communities (Nunes *et al.*, 2019). Wild meat can provide up to 72% of the protein consumed by inhabitants of this region (Sarti *et al.*, 2015). Therefore, wildlife should be considered as a food source, and wildlife management considered both a right and a necessity for indigenous peoples and local communities (Pezzuti, 2009).

In contexts where the consumption of wild animals is essential for food sovereignty, due to factors such as limited access to alternative meats and food preferences, wildlife can be considered a common-pool resource (CPR). As such, wildlife use is understood under a regime of property that is distinct from unregulated open access or private property. In fact, wildlife management as a CPR is a collective action based on the definition of system boundaries and on the assignment of authorized users (Ostrom, 2002). Without proper delineation, or in a regime of open access, the benefits obtained through user cooperation can be accessed by potential resource destroyers (Ostrom, 2002). Thus, it is important to enable subsistence wildlife users to control access to animals, as well as coordinate the use of this CPR.

Territories, in general, result from processes of appropriation, control, use, and attribution of meanings over areas and portions of space that are transformed into actual territories (Godoi, 2014). The development of territories is the result of historical connections of groups with specific places and of principles of organization systematized through continuous processes (Godoi, 2014). Territorialization, or the social process of territory production, involves two dimensions: a symbolic one, related to the development of identities, and a functional one, related to access control (Haesbaert, 2007).

The notion of traditional territories as spaces containing CPR addresses the functional dimension of territorialities. Territorialities are then assumed as a way for individuals and groups to control objects, people, and relationships by delimiting and asserting dominion over specific areas (Sack, 1983). Therefore, proposals for *territorial planning* - the physical and legal organization of space - and for *territorial management* - the administration of activities and resources in this space - aimed at conserving natural resources must respect the local territorialities as well as the biology of species and their populations' ecology. Thus, recognizing the right of groups to organize would support the reconciliation of different levels of regulation (Ostrom, 2002).

In the Reserva de Desenvolvimento Sustentável Amanã (hereafter Amanã Reserve), a protected area in the state of Amazonas, Brazil, hunting has prompted academic discussions about ecological impacts and sustainable management of wildlife (e.g. Amaral, 2012; Valsecchi *et al.*, 2014; Bizri, *et al.* 2016; Pereira *et al.*, 2019). This article aims to describe the settlement of locals and natural resource use in a portion of the Amanã Reserve, discuss the territorial range and hunting areas of one community, and present a territorial planning proposal (take and no-take zones) for the sustainable management of subsistence hunting.

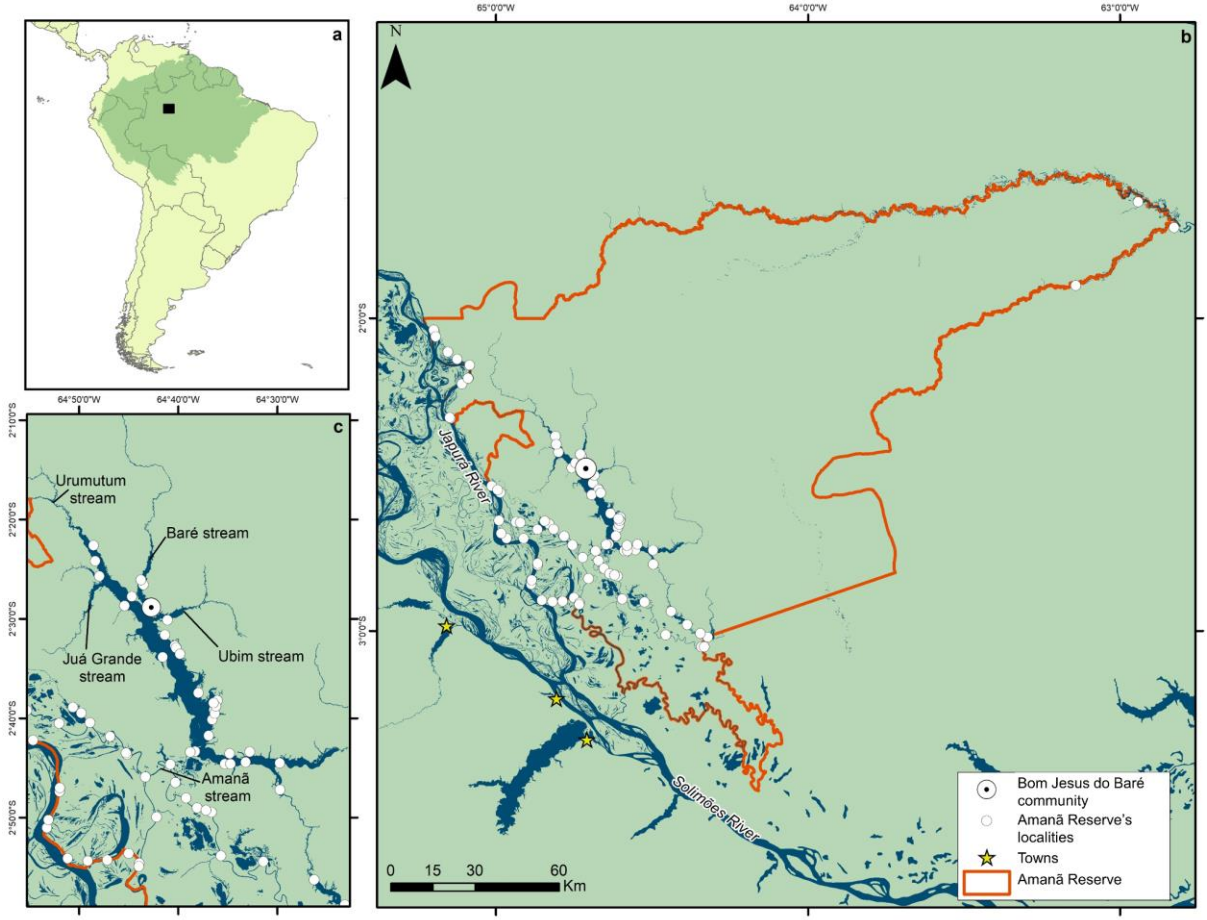
MATERIALS AND METHODS

Study Area

The riverine community of Bom Jesus do Baré (BJB), located in the headwater region of Amanã Lake, in Maraã municipality, Amazonas, Brazil, was chosen for this study due to its history of

settlement (>50 years) and the occurrence of participatory monitoring of wildlife use between 2002 and 2019 (Figure 1). Founded in 1990, by 2018 BJB was composed of 80 residents from 13 family groups (Amazonas, 2020), and had the following collective infrastructures: a church, a school, a community center, a cassava flour processing center, and a diesel thermoelectric plant. The community's economy was based on small-scale agriculture and natural resource extraction.

Figure 1 - Maps showing the location of a) the study site in relation to the Amazon biome; b) the Amanã Reserve; c) Bom Jesus do Baré community in the Amanã Lake region.



Source: The authors (2023).

BJB is one of the 114 localities in the Amanã Reserve, a state protected area of 2,348,962.9 ha (23,489.62 km²) (Amazonas, 2020) considered a priority area for biodiversity conservation (Capobianco *et al.*, 2001) due to factors such as the occurrence of primary forests, high endemism, and high diversity of ecoregions. As a sustainable use reserve, management of natural resources is conducted by Amanã Reserve's residents (Brasil, 2000). Examples of local resource management plans include fisheries management within its boundaries and in its buffer zone (Amazonas, 2020).

Study Design, Data Collection, and Analysis

The data analyzed in this article were obtained from two distinct research works. The first addressed the history of one religious practice and the human settlement in the Amanã Lake region. The second surveyed hunting locations and the area of extractive activities of three communities on the same lake.

Historical data on the extent of the use areas and the territorial dynamics of Amanã Lake and BJB community members were collected through semi-structured interviews (Protocol#: CAAE 89407018.3.0000.5016). These interviews provided information about the history of the studied community and the human settlement in the Amanã Lake region over the last five decades. They took place in 2018 with four of the oldest residents of the BJB community participating in the interviews, aged between 48 and 67 years.

Spatial data on BJB's recent natural resource use, specifically on hunting locations,

were collected in various stages. Between 2002 and 2018, hunting locations were registered through the Sistema de Monitoramento do Uso da Fauna, a participatory wildlife use monitoring system (hereafter: SMUF) (Amaral, 2012), including other information on the hunting events provided by community residents, such as information about the hunted individuals (e.g., species, weight, sex), and techniques and hunting instruments used. In 2018, this culminated in the georeferencing of all hunting sites registered in the monitoring system.

The second stage, also in 2018, consisted of participatory mapping of hunting areas and historical use of natural resources (Protocol#: CAAE 89093118.4.0000.8117). This involved a cartographic literacy workshop and the plotting of data on a map with a cartographic base. Participants were asked to indicate i) the locations used for hunting and other extractive activities in the last 50 years in the Amanã Lake basin, ii) areas no longer used due to the emergence of neighboring communities, iii) the existence of conflict areas over resource use, and iv) regions considered suitable for wildlife management (i.e., take and no-take zones).

In the third stage, data was organized into a Geographic Information System (GIS). For each recorded hunting location, influence areas were calculated using 3 km buffers. The total area used for hunting during the period was determined by combining the buffers' areas. The total area in participatory mapping was estimated by digitizing the map and creating polygons that encompassed the most extreme points mentioned by participants for hunting wildlife, considering the paths used to access them. Historically used regions were also calculated using polygons.

The territorial planning for subsistence hunting was based on the history of use, the distance to hunting areas of other communities, and the occurrence of conflicts. Between 2018 and 2019, four workshops were held in BJB at which residents discussed the importance of hunting for their food security, the impact of the activity on biodiversity, the possibilities for spatial management of wildlife, and proposals for territorial planning and their implementation.

The territorial planning workshops were attended by 80% (N = 64) of the community's residents, with a greater number of adults (N= 27; 42.19%), 15 men and 12 women, followed by children from 0 to 10 years of age (N = 21; 32.81%) and youth between 11 and 18 years of age (N = 16; 25%); however, only the adult residents were considered participants of this study.

RESULTS AND DISCUSSION

Settlement History and Use of Natural Resources in the Amanã Lake

Two territorial perspectives were identified. The "*traditional*" one was based on land ownership (property rights) and resource control by family groups, with diffuse boundaries due to seasonal and decentralized use. The *traditional perspective* was related to the historical process of land purchases from private owners or from seizures requested to the public authority by i) large landholders, sales, ii) or concessions of areas to extractivist families, and iii) inheritance for younger generations (Alencar, 2007). The second perspective is "*institutional*", in which communities are central territorial and political units, and external management bodies define fixed boundaries for their use areas based on these units. In this perspective, communities must develop their activities according to the notion of common use.

The current human settlement of the Amanã Lake region, as in the Middle Solimões region, began in the second half of the 19th century and was driven by biodiversity use, especially rubber (*Hevea brasiliensis*) extraction (Alencar, 2010a). From the early decades of the 20th century, extractivist families from the western Amazon, such as from Japurá, Juruá, and Jutaí Rivers, began to settle near the lake, starting a settlement process that can be divided into two periods (Alencar, 2010a).

During the first half of the 20th century, the landowning traders (*patrões)*, exerted control over access to the natural resources of the Amanã Lake region (Alencar, 2009; 2010a). During this period, the settlement pattern of the lands around the lake was mainly seasonal, with floodplain residents working in the upland forests during the wet season and returning to their homes during the dry season, where they mainly harvested Arapaima fish (*Arapaima gigas*). Besides rubber, the natural resources exploited in the region included Brazil nuts (*Bertholletia excelsa*) and wildlife, including those species that had skins valued as commercial products, the so-called "*peles fantasia*" (Alencar, 2007; Antunes, *et al*., 2016), like otters (*Lontra longicaudis*), peccaries (*Tayassu pecari*), and small cats (*Leopardus spp*.).

From the second half of the 20th century, there was a decline in the rubber market and a decrease in landowner influence as it was replaced by the influence of river traders known as "*regatões*." During this period, ideas of property over "parts of the land" emerged among some families who had already occupied the lake shores seasonally, like the Tavares family, who had a use concession granted by the former landlord (Alencar, 2007). With the establishment of local families and new families coming from the Juruá river basin, there was an increase in human population on the shores of the lake and its tributary streams, potentially increasing pressure on resources used in the region, such as wildlife.

In the 1980s, the creation of the first Base Ecclesial Communities began a model introduced in the region by the Catholic Church (Peralta, 2022). In this model, communities were characterized by political organization, collective territorial management, kinship networks, and collective memory, with the latter being an important element of territorial connectedness (Alencar, 2010b). Concurrently, there was a gradual transition from forest extractivism to agriculture, leading families previously dispersed in seasonal locations to gather and settle (Alencar, 2010a). This phenomenon mainly occurred in the upland areas, closer to major bodies of water, and in places with easy access to natural resources, such as at the mouth of the *Baré* stream (Alencar, 2007).

In 1998, the settlement process of the Amanã Lake region entered a new phase with the inclusion of local groups in the Sustainable Development Reserve model (Queiroz; Peralta, 2006). This resulted in a new territorial organization based on the *community perspective* introduced by the Catholic Church. The BJB community became part of the Amanã Lake sector, along with 20 other localities, co-managing the use of the lands and resources around the lake.

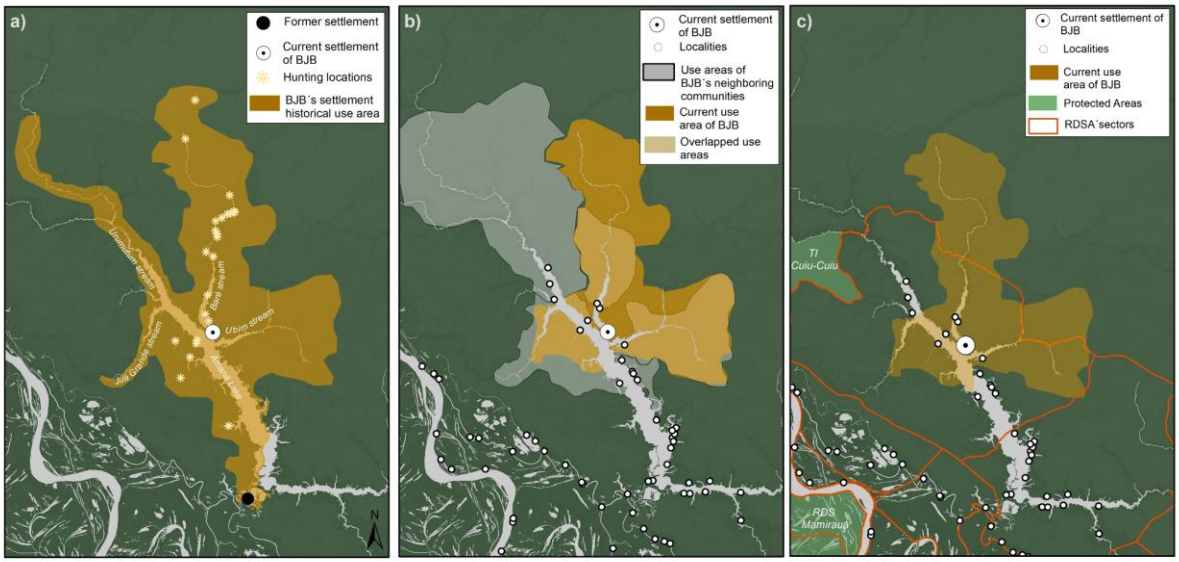
With the creation of the Amanã Reserve, the management of the territory was shared between local residents and the Secretaria Estadual de Meio Ambiente (SEMA), the Amazonas state environmental agency. Management bodies were established, including community and sector representative associations and the Management Council with deliberative power (Amazonas, 2020). Subsequently, at the request of the State Secretariat of the Environment, a management plan was developed to regulate human settlement patterns and natural resource use (Amazonas, 2020). Thus, principles of common resource management were established, such as limitations on access and use, adaptation of local rules, establishment of collective decision-making arrangements, and alignment between different levels of power (Ostrom, 2002).

Over the years, the creation of the Amanã Reserve and the consolidation of the riverine communities' territory led to a change in the local territorial perspective. Similar to what happened in other Protected Areas, like the Reserva Extrativista de Tapajós Arapiuns (RESEX Tapajós Arapiuns, a protected area) in Santarém, Pará, Brazil, families had to reorganize themselves based on formal and informal rules, using tradition as a reference to question interventions and seek effective negotiations (Andrade; Silva, 2019). However, these transformations occurred parallel to territorialization processes, with conflicts between founding families of the oldest communities and new groups. These new groups are usually derived from historical groups or of similar origin, but with distinct consolidation processes, sought to control certain territories to affirm their identities and autonomy (Alencar, 2010b).

Changes in the Territorial Delimitation of Bom Jesus do Baré

The territorial arrangement resulting from the merge of *traditional* and *institutional perspectives* had significant impacts on Bom Jesus do Baré's territory. Two important phenomena include: the reduction of the use area and the occurrence of overlaps (Figure 2). The contraction of the territory resulted in the decrease of areas historically accessed by BJB's community members, the heirs according to the *traditional* perspective. On the other hand, overlaps occurred in areas where land ownership became shared, claimed, and disputed by the same community members, residents, or users according to *institutional* perspective.

Figure 2 - Maps of the Amanã Lake region indicating: a) the historical use area of the Tavares family; b) use areas of BJB's residents and neighboring communities; c) the Amanã Reserve's territorial sectors and the use area of BJB.



Source: The authors (2023).

The remarkable moments in the history of the recent human settlement of Amanã Lake region are also expressed in the history of the settlement of the BJB community, as recorded in a research interview on November 13, 2018, in the municipality of Maraã-AM.

> […] we were always like this: Dad worked here and lived outside [of the lake]. But there we had nothing because it flooded every year. Then, when the wet season started, it destroyed everything. Sometimes he came here to harvest Brazil nuts. He spent about two weeks here and went back there, and we didn't even have a canoe. It was a rather sad situation, look. […]. Then, he got to build a tiny house here, but it was really small, because the work for us was in the forest, right? […] At that time nobody grew anything, nobody farmed anything, it was just about the rubber. I didn't harvest rubber, but I tapped sorva a lot. Then, we spent the whole winter. June, July, August... When the dry season began, we went outside to fish Arapaima.

At the origin of this community lies a family nucleus a who was born in the floodplain of the Amanã stream (Figure 1). As was customary in the mid-20th century, he used the shores of the lake during the wet season only. The rise in water level allowed access to regions further in the forest, ideal for collecting forest products like the latex of *sorveira* (*Couma utilis*).

Accounting for the areas used in the lake's uplands and the seasonal use of the floodplain portions in the Amanã stream resulted in a use area of 128,081.41 ha for this family nucleus and its aggregates (Figure 2a). This joint use of the floodplains and uplands lasted until the early 1970s when the family abandoned the house in the flooded areas to settle at the mouth of the *Baré* Stream.

Like other portions of the Amanã Lake, the *Baré* Stream region was exploited by the head of this family and his relatives for rubber and Brazil nut extraction. This is also the case of the *Juazinho* Stream, where his wife's relatives worked (Alencar, 2007). However, this was not the only example, as recorded in a research interview on November 13, 2018, in the municipality of Maraã-AM:

> This area here, where Dad worked, was his father's. The father of the late dad. And he died and handed it over to the children, right? To take care of. Because this area here, in the time of Dad's father, was all documented. Whoever had their piece of land, who had all the documents, didn't have misunderstandings, because everybody knew it belonged to that guy, right? And right there, at the border of Dad's, was Joaquim Vicente's, a brother-in-law of Compadre Mimi who died not long ago. They were: Paixão, Uncle Joaquim, and the late Chico Vicente, who was the father of Comadre Dica, and José Vicente. There were four heirs of that...

> Because the old man died and left it to them. And this piece of land here was also Dad's and his brothers, right?

Thus, unlike other areas frequented by the head of this family while employed by landlords, he inherited a property from his father in the lower part of this stream. This was a determining factor in both choosing the place where the community would later settle and for the increased concentration of its residents' uses along this stream.

In the early 1990s, in line with the process of grouping the lake region's residents, the BJB community was founded from this family nucleus. As a result of the consolidation of BJB and other neighboring communities, its residents abandoned some sites used in the production of nuts and rubber. These residents now use 88,743.36 ha, indicating a territory reduction of about 30.71% compared to the family's historical land use.

It is important to note that this did not prevent distant areas, which according to the *institutional perspective* would not be part of the community's territory, from continuing to be accessed by relatives of the late patriarch. Thus, his heirs were also heirs of knowledge about places and resources historically used by the family. Thus, part of the territory currently used by the residents of BJB overlapped with the territories of use of other neighboring communities (Figure 2b).

Hunting Areas of Bom Jesus do Baré

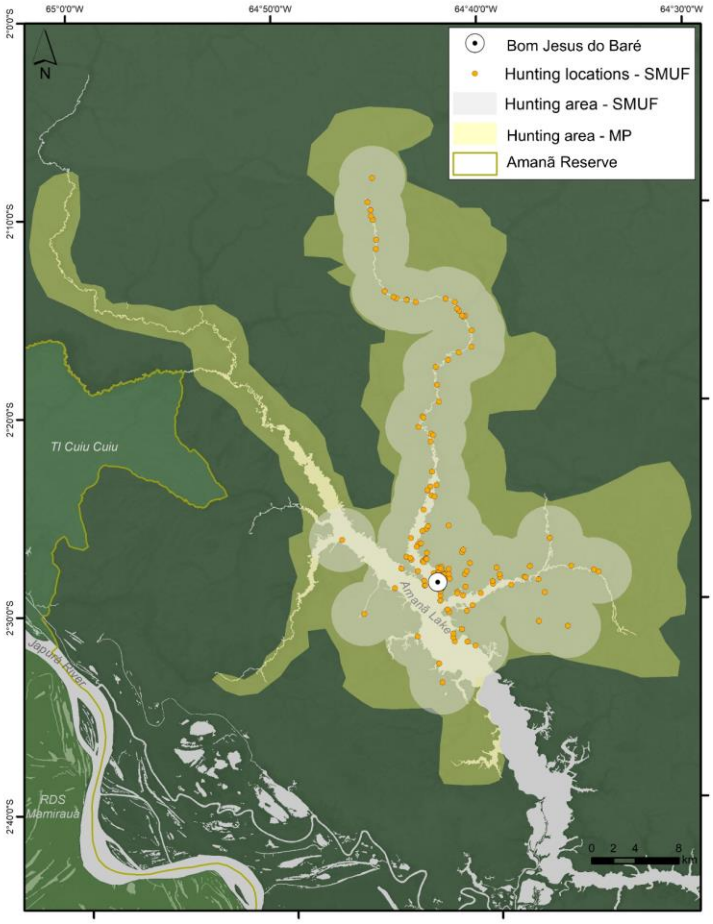
It is important to distinguish the community's use area from their hunting area. The hunting area of BJB's residents underwent a similar process to the community's use area, with contraction and overlap. However, the contraction of the hunting area did not exactly match the contraction of the use area. These differences resulted in overlaps, with hunting events being recorded in use areas assigned to other communities according to the *institutional perspective*.

Hunting in BJB follows a spatial pattern similar to that adopted since the oldest times of Amanã Lake's settlements, with residents using bodies of water and their surroundings as the main hunting locations and orientation references in the territory. This is a similar pattern to that adopted by riverine communities in other parts of the Amazon Basin (Read *et al.*, 2010). Participatory mapping allowed for the estimation of the area used for hunting in the last 50 years, revealing that the formerly established sites for diverse forest uses were still used for hunting.

The hunting area used by BJB residents also included the use areas of residents from five other localities in the lake, totaling 50,102.95 ha (56.46%) of overlap (Figure 2b). This resulted in territorial conflicts with at least two communities neighboring BJB, related to control of access to certain locations. One case in the same stream to the north involves a community formed in 2002 by immigrants who, although lacking settlement history in the region, had kinship ties to the Tavares family through marriage (Alencar, 2007). In another case to the east in the Ubim Stream, there was a family nucleus as old in the region as the nucleus presented in this study which started in the 2000s a settlement process similar to that which originated the BJB community. These examples demonstrate how the establishment of new settlements, including those occupied by communities considered *traditional*, can impact the territorial planning and resource use strategies implemented in the Amanã Reserve (Alencar, 2010b).

The hunting area assessed during the participatory mapping was 114.90% larger than that recorded by the hunting monitoring system, 60,561.51 ha (Figure 3). This was most likely due to the temporal scope of the monitoring system, which covered 16 years (2002-2018), while the participatory mapping considered information from the last 50 years. Furthermore, participatory mapping was essential for obtaining more accurate historical and spatial data than the wildlife use monitoring system. Thus, unlike the estimate made with the monitoring system's data, which required the use of buffers, participatory mapping revealed the extent of the hunting area with greater fidelity to local practices.

Figure 3 - BJB hunting areas assessed through the Sistema de Monitoramento do Uso da Fauna (SMUF = 60,561.51ha) and participatory mapping (MP = 12,8081.41ha).



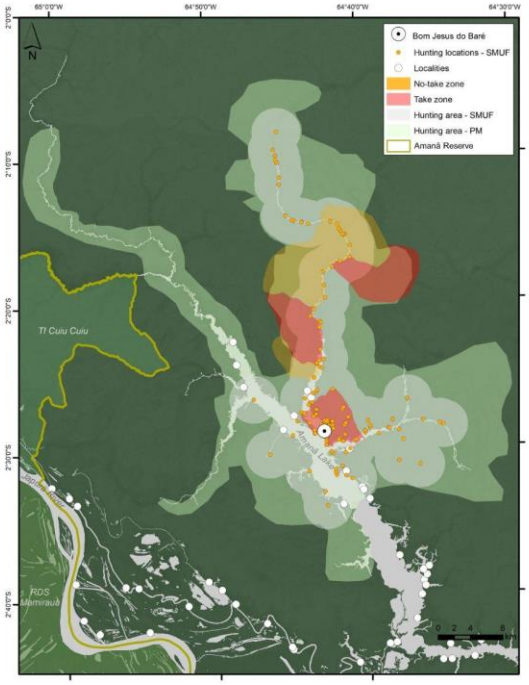
Source: The authors (2023).

Territorial planning for wildlife use and implications for its management

The proposed territorial planning for wildlife management was based on established no-take zones' models (Figure 4). The idea was to incorporate the categorization of take and no-take zones in the sustainable management of Arapaima (Amaral *et al.*, 2011) and in the territorial planning of the RDSs' protected area (Queiroz; Peralta, 2006; Amazonas, 2020). The proposed territorial planning is like model of source and sink zones (Pulliam, 1988). In addition, an important feature of the proposed territorial planning is the temporal rotation of the functions of each area in the system, resembling the concept of rotational grazing (Briske *et al.*, 2008). This approach is regionally established in the succession of cultivation and rest in the use of swidden areas (Viana *et al.*, 2016).

The areas assigned for the spatial management of wildlife to maintain BJB residents' subsistence hunting are included in the territory of the community and resulted in 22,216.22 ha, with 10,915.37 ha designated for the protection of source zones of wildlife populations (no-take zones) and another 11,300.85 ha for the maintenance of the community's hunting activity (take zones) (Figure 4).

Figure 4 - Territorial planning for wildlife management in Bom Jesus do Baré (BJB).



Source: The authors (2023).

The community members highlighted two main factors contributing to the success of the proposed territorial planning. First, the principle of rotating functions is already used in the management of swidden areas, which would facilitate its incorporation into community activities. Second, spatial management would be easier to implement and enforce compared to other forms of wildlife management, such as the establishment of preferred hunting quotas, for example, for turtle management by residents of localities in the Rio Negro Basin (Rebêlo; Pezzuti, 2000). The presence of Voluntary Environmental Agents (Franco, 2020) and a hunting monitoring agent in the community would also contribute to the implementation of and compliance with local rules that are co-designed for sustainable management.

However, territorial planning faced challenges due to the application of collective use norms in a territoriality not entirely based on current collective units. Conflicts related to wildlife use in BJB are mainly linked to their overlapping with other communities' areas. This is a point of resistance relying on the *traditional perspective*, through which BJB community members seek to conserve or claim the right to use areas known by them for decades. This situation is similar to that observed in the region of Lago Grande, in Santarém, Pará, Brazil, where people's movements between floodplain and upland areas were not considered in territorial planning and policies, hampering conservation actions (Folhes, 2016).

There is a possible contradiction in the coexistence of territorial perspectives in the region, highlighted by the point of resistance observed. This contradiction would lie in the need, according to BJB's residents, to strengthen the exclusive delimitation of areas for each community in the proposed territorial plan, with the definition of functions and rotation for the delimited zones. They argue for intensifying surveillance by the Amanã Reserve's management body in collaboration with the communities to prevent intrusions by neighbors and ensure no harvest is held at the no-take zones. However, this contradiction is only apparent, as it reflects the collective understanding that the proposed territorial ordering for wildlife management is another step towards the *institutional* perspective.

Property rights, which underlined conflicts over natural resources in the region, is a power relation that varies according to social, economic, and environmental factors (Grossi, 1992, apud Benatti *et al.*, 2021). Thus, it is essential to integrate the current normative model and the customary normative models of traditional communities to preserve cultural and environmental heritage (Benatti *et al.*, 2021). Such integration, while facilitating community management strategies, can also be effective for the recovery of wildlife population stocks (Campos-Silva; Peres 2016; Campos-Silva *et al.*, 2018). Therefore, it is necessary to consider these different perspectives in territorial plans for wildlife management to

ensure environmental sustainability and harmony between interests.

FINAL CONSIDERATIONS

The human settlement process and use of natural resources in the Amanã Lake has undergone transformations that ranged from private ownership to the right to use granted by the State, through communitarization and the prevalence of agriculture in recent decades. Local territoriality can be defined as a synthesis of *traditional* and *institutional* perspectives. In this context, changes in the territorial delimitation of BJB have resulted in contractions and overlaps in the community's use area. Its hunting areas have also been reduced, although less so, which has generated conflicts and raised questions about territorial planning in this region. Negotiation and occurrence of disputed areas are significant traits of the territoriality of local communities.

In the case studied, the traditional territory comprised private areas, legally recognized or not, assuming resources with individual owners. The traditional territory has been incorporated into the state territorial planning since the creation of the protected area, through the consolidation of community territories, which did not necessarily coincide with the areas historically used by families, and of the common-pool resource regime. This is key to territorial planning since knowledge of previously explored areas, now located in territories of neighboring communities, may result in incursions and, eventually, dispute over these areas in the proposed territorial planning. Despite the occurrence of hunting pressure and free wildlife movements between community use areas, the focus should be on the mobility of users in known areas, as part of territories delineated by their historical use.

The territorial planning for wildlife management in BJB was considered suitable by its residents, but the effective integration of the traditional and institutional perspectives remains necessary. One option could be increasing the role of the managing body in monitoring territorial agreements, strengthening the *institutional* perspective. However, without supporting conditions to the *institutional* perspective, a suitable solution would be to reinforce the *traditional* perspective, highlighting it in the proposed territorial arrangement. In this sense, territorial planning could incorporate greater scales than the community one, relying on the diffuse characteristic of traditional territorialities.

To strengthen the *traditional* perspective in the territorial planning, all local actors must be considered, especially the communities that share the use of the territory, as defined by the rules of coexistence detailed in the Amanã Reserve's Management Plan, which were not the focus of this analysis. Therefore, strategies that consider overlaps and conflicts should be useful in the development of a comprehensive model of sustainable wildlife management. Thus, encompassing the diffuse characteristic of local territorialities and the multitude of involved actors and their histories.

ACKNOWLEDGMENTS

We thank the Amanã Lake's residents who participated in this research and the Bom Jesus do Baré Community Association; to J. Santos for the design of the participatory activity and to the funders: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), and Gordon and Betty Moore Foundation. Thanks to D. Tregidgo and Z. McMillian for their review of the English version of this manuscript.

FUNDING SOURCE

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior; Conselho Nacional de Desenvolvimento Científico e Tecnológico, processes n° 312545/2016-9 and 300022/2017-4; Gordon and Betty Moore Foundation, grant n°5344.

REFERENCES

ALENCAR, E. F. **Estudo da ocupação humana e mobilidade geográfica de comunidades rurais da Reserva de Desenvolvimento Sustentável Amanã - RDSA**. Final Report. Santarém/PA: IDSM, 2007.

ALENCAR, E. F. O tempo dos patrões 'brabos': fragmentos da história da ocupação humana da Reserva de Desenvolvimento Sustentável Amanã. **Amazônica - Revista de Antropologia**, v. 1, n. 1, p.178-199, 2009. https://doi.org/10.18542/amazonica.v1i1.148

ALENCAR, E. F. Dinâmica territorial e mobilidade geográfica no processo de ocupação humana da Reserva de Desenvolvimento Sustentável Amanã-AM. **UAKARI**, v. 6, n. 1, p. 39-58, 2010a. Available: https://uakari.mamiraua.org.br/index.php/UAKARI/article/view/73/84. Accessed on: jun. 20, 2023.

ALENCAR, E. F. Reflexões sobre a gestão de territórios e o uso de recursos naturais em unidades de conservação de uso direto: o caso da RDS Amanã, AM. In: REUNIÃO BRASILEIRA DE ANTROPOLOGIA, 27., 2010, Belém-PA. Anais da 27ª Reunião Brasileira de Antropologia, 2010b. Disponível em: https://evento.abant.org.br/rba/27RBA/arquivos/grupos_trabalho/gt34/efa.pdf. Acesso em: 08 abr. 2024.

ALMEIDA, A. W. B. de. Terras tradicionalmente ocupadas: processos de territorialização e movimentos sociais. **Revista brasileira de estudos urbanos e regionais**, v. 6, n. 1, p. 9-9, 2004. https://doi.org/10.22296/2317-1529.2004v6n1p9

AMARAL, E.; SOUSA, I. S.; GOLÇALVES, A. C. T.; CARVALHO, G.; BRAGA, R.; RONAN, P.; VILENA, J. **Manejo de pirarucus (Arapaima gigas) em lagos de várzea de uso compartilhado entre pescadores urbanos e ribeirinhos.** Protocolos de manejo dos recursos naturais. Tefé-AM: IDSM, 2011. Available:https://www.mamiraua.org.br/documentos/86006ccf5c8054dd6fef087cf5690c1f.pdf. Accessed on: jun. 20, 2023.

AMARAL, J. V. do. **Caça de animais silvestres nas reservas de desenvolvimento sustentável Mamirauá e Amanã**. 2012. 140 p. Thesis (PhD in Ecology, Conservation and Wildlife Management) - Instituto de Ciências Biológicas da Universidade Federal de Minas Gerais, Belo Horizonte/MG, 2012. Available: http://hdl.handle.net/1843/BUOS-978FZW. Accessed on: sep. 06, 2023.

AMAZONAS. Secretaria do Meio Ambiente. **Plano de gestão da Reserva de Desenvolvimento Sustentável Amanã** (short version). Amazonas, 2020. Available: https://www.mamiraua.org.br/documentos/2b0abd59b22aafabbf7f0cc81dfb7689.pdf. Accessed on: jun. 20, 2023.

ANDRADE, M. M. de; SILVA, D. W. Modos de organização social e dinâmicas institucionais na Reserva Extrativista Tapajós-Arapiuns, estado do Pará, Brasil. **Sustentabilidade em Debate**, v. 10, n. 2, 2019. https://doi.org/10.18472/SustDeb.v10n2.2019.19809

ANTUNES, A. P.; FEWSTER, R. M.; VENTICINQUE, E. M.; PERES, C. A.; LEVI, T.; SHEÁRD JR, G. H. Empty forest or empty rivers? A century of commercial hunting in Amazonia. **Science advances**, v. 2, n. 10, p. e1600936, 2016. https://doi.org/10.1126/sciadv.1600936

BENATTI, J. H.; SILVA, A. F. C. da; OLIVEIRA, J. A. de. Direitos territoriais dos povos e comunidades tradicionais e a propriedade comum. **Revista do Ministério Público do Estado do Pará**, v. 14, n. 14, p. 89-112, 2021.

BIZRI, H. R.; ARAÚJO, L. W. S.; ARAÚJO. W. S.; MARANHÃO, L.; VALSECCHI, J. Turning the game around for conservation: using traditional hunting knowledge to improve the capture efficiency of Amazon lowland pacas. **Wildlife Biology**, v. 22, n. 1, p. 1-6, 2016. https://doi.org/10.2981/wlb.00127

BRASIL. Ministério do Meio Ambiente. **SNUC** – Sistema Nacional de Unidades de Conservação da Natureza: Lei nº 9.985, de 18 de julho de 2000. Available: https://www.planalto.gov.br/ccivil_03/leis/l9985.htm. Accessed on: jun. 20, 2023.

BRISKE, D. D.; DERNER, J. D.; BROWN, J. R.; FUHLENDORF, S. D.; TEAGUE, W. R.; HAVSTAD, K. M.; GILLEN, R. L.; ASH, A. J.; WILLMS, W. D. Rotational grazing on rangelands: reconciliation of perception and experimental evidence. **Rangeland Ecology & Management**, v. 61, n. 1, p. 3-17, 2008. https://doi.org/10.2111/06-159R.1

BRONDIZIO, E. S.; LE TOURNEAU, F. M. Environmental governance for all. **Science**, v. 352, p.1272-1273, 2016. https://doi.org/10.1126/science.aaf5122

CAMPOS-SILVA, J. V.; PERES C. A. Community-based management induces rapid recovery of a high-value tropical freshwater fishery. **Scientific Reports**, v. 6, 2016. https://doi.org/10.1038/srep34745

CAMPOS-SILVA, J. V.; HAWES, J. E.; ANDRADE, P. C. M.; PERES, C. A. Unintended multispecies co-benefits of an Amazonian community-based conservation programme. Nature **Sustainability**, v. 1, 2018. https://doi.org/10.1038/s41893-018-0170-5

CAPOBIANCO, J. P. R.; VERÍSSIMO, A.; MOREIRA, A.; SAWER, D.; IKEDA, S.; PINTO, L. P. **Biodiversidade na Amazônia brasileira:** avaliação e ações prioritárias para a conservação, uso sustentável e repartição de benefícios. Instituto Socioambiental, São Paulo, 2001.

FOLHES, R. T. **O Lago Grande do Curuai:** história fundiária, usos da terra e relações de poder numa área de transição várzea-terra firme na Amazônia. 2016. Thesis (Doctorate in Amazonian Ecosystems and Socio-environmental Dynamics). Programa de Pós-Graduação em Ciências Ambientais da Universidade Federal do Pará, Belém, 2016. Available: https://repositorio.museu-goeldi.br/handle/mgoeldi/1963. Accessed on: sep. 04, 2023.

FRANCO, C. L. B. **Proteção ambiental de base comunitária em duas áreas protegidas na Amazônia brasileira**. 2020. Dissertation (Professional Master's Degree in Management of Protected Areas in the Amazon). Instituto Nacional de Pesquisas da Amazônia, Manaus, 2020. Available: https://repositorio.inpa.gov.br/handle/1/36446. Accessed on: sep. 04, 2023.

GODOI, E. P. de. Territorialidade: trajetória e usos do conceito. **Raízes: Revista de Ciências Sociais e Econômicas**, v. 34, n. 2, p. 8-16, 2014. https://doi.org/10.37370/raizes.2014.v34.411

HAESBAERT, R. Território e multiterritorialidade: um debate. **GEOgraphia**, v. 9, n. 17, p. 19-45, 2007. https://doi.org/10.22409/GEOgraphia2007.v9i17.a13531

LE TOURNEAU, F.; BEAUFORT, B. Exploring the boundaries of individual and collective land use management: institutional arrangements in the PAE Chico Mendes (Acre, Brazil). **International Journal of the Commons**, v. 11, n. 1, 2017. https://doi.org/10.18352/ijc.589

LITTLE, P. Territórios sociais e povos tradicionais no Brasil: por uma antropologia da territorialidade. **Anuário antropológico**, v. 28, n. 1, p. 251-290, 2003.

NUNES, A. V. et al. Irreplaceable socioeconomic value of wild meat extraction to local food security in rural Amazonia. **Biological Conservation**, v. 236, p. 171-179, 2019. https://doi.org/10.1016/j.biocon.2019.05.010

OSTROM, E. Reformulating the Commons. Tradução Leila Costa Ferreira. **Ambiente & Sociedade**, n. 10, p.1-21, 2002.https://doi.org/10.1590/S1414-753X2002000100002

PERALTA, N. A Teologia da Libertação, o Ambientalismo e as Unidades de Conservação no Amazonas. **ContraCorrente** n. 18, p. 103-128, dez. 2022. Available: http://periodicos.uea.edu.br/index.php/contracorrente/article/view/2543. Accessed on: 04 sep. 2023.

PEREIRA, P. M.; VALSECCHI, J.; QUEIROZ, H. Spatial patterns of primate hunting in riverine communities in Central Amazonia. **Oryx**, v. 53, n. 1, p. 165-173, 2019. https://doi.org/10.1017/S0030605317000199

PEZZUTI, J. C. B. Manejo de caça e a conservação da fauna silvestre com participação comunitária. **Paper do NAEA**, v. 35, p. 1-13, 2009. http://dx.doi.org/10.18542/papersnaea.v18i1.11382

PULLIAM, H. R. Sources, sinks, and population regulation. **The American Naturalist**, v. 132, n. 5, p. 652-661, 1988. https://doi.org/10.1086/284880

QUEIROZ, H. L.; PERALTA, N. Reserva de Desenvolvimento Sustentável: Manejo integrado dos recursos naturais e gestão participativa. In: GARAY I.; BECKER B. K. (orgs.). **Dimensões humanas da biodiversidade**, Petrópolis: Editora Vozes, p. 447-476, 2006.

READ, J. M. et al. "Space, Place, and Hunting Patterns among Indigenous Peoples of the Guyanese Rupununi Region." **Journal of Latin American Geography**, vol. 9, n. 3, p. 213-243, 2010. Available: https://www.jstor.org/stable/25765339. Accessed on: jun. 20, 2023.

REBÊLO, G.; PEZZUTI, J. Percepções sobre o consumo de quelônios na Amazônia: sustentabilidade e alternativas ao manejo atual. **Ambiente & Sociedade**, n. 6/7, p. 85-104, 2000. https://doi.org/10.1590/S1414-753X2000000100005

RIBOT, J. C.; PELUSO, N. L. A theory of access. **Rural sociology**, v. 68, n. 2, p. 153-181, 2003. https://doi.org/10.1111/j.1549-0831.2003.tb00133.x

SACK, R. D. Human territoriality: a theory. **Annals of the association of American geographers**, v. 73, n. 1, p. 55-74, 1983. https://doi.org/10.1111/j.1467-8306.1983.tb01396.x

SARTI, F. M. et al. Beyond protein intake: bushmeat as source of micronutrients in the Amazon. **Ecology and Society**, v. 20, n. 4, 2015. Available: https://www.jstor.org/stable/26270286. Accessed on: jun. 20, 2023.

VALSECCHI, J. BIZRI H. R.; FIGUEIRA, J. E. C. Subsistence hunting of *Cuniculus paca* in the middle of the Solimões River, Amazonas, Brazil. **Brazilian Journal of Biology**, v. 74, p. 560-568, 2014. https://doi.org/10.1590/bjb.2014.0098

VIANA, F. M. de F.; STEWARD A. M.; RICHERS, B. T. T. Cultivo itinerante na Amazônia central: manejo tradicional e transformações da paisagem. **Novos Cadernos NAEA**, v. 19, n. 1, 2016. http://dx.doi.org/10.5801/ncn.v19i1.1816

AUTHOR CONTRIBUTION

L.F.L. conception, data collection, formal analysis and writing – original draft. L.P.L.N.G. conception, data collection, formal analysis and writing – original draft. C.L.B.F. formal analysis and writing – original draft. C.F.A.V.N. formal analysis and writing – original draft. J.V. conception and writing – original draft.