Environmental and Social Impact Assessment

and

Environmental and Social Management Plan

Aug 3, 2022

CEPF Grant 13216

FISHBIO

A new model of community-based inland fisheries management for Costa Rica

Rey Curré, Costa Rica

Grant Summary

1. FISHBIO
2. A new model of community-based inland fisheries management for Costa Rica.
3. CEPF 13226
4. Amount $25,000 USD
5. Proposed start: Feb 1, 2023. Proposed end: Jan 31, 2025
6. Country: Costa Rica. Provice: Puntarenas. Indigenous Territory of Rey Curré
7. Summary of the project

Rationale:

Costa Rica is a conservation leader and a role model for the world. To date, the country has protected about 28% of its land, 2.7% of the ocean, and is planning to expand its oceanic protected area to more than 30% of its territorial waters (Price 2021, World Bank, 2022, UNEP-WCMC and IUCN, 2022). Costa Rica is also building the foundation for the sustainable, efficient, and socially-inclusive use of its natural resources for economic growth (i.e. green and blue economies). The government and numerous NGOs are at the forefront of these efforts, ensuring that the economic benefits are received by the local people.

The last environmental frontier of Costa Rica lies in the effective conservation and sustainable use of its freshwater resources. Ignoring the health of rivers, lakes, and other freshwater wetlands can hinder the large investments in ocean conservation and the blue economy. Specifically, mismanaged watersheds may result in the creation of dead zones that affect coastal fisheries (Darghouth *et al*. 2008, UNEP 2006). Riparian restoration, agriculture, and waste management at the watershed level clearly require better management. For example, wastewater and greywater remain largely unregulated due to multiple regulatory authorities involved without clearly defined responsibilities (Shahady and Boniface 2018). A more overlooked issue is that of freshwater fisheries management and conservation (Funge-Smith 2018). This is likely due to the fact that the freshwater fishery is small compared to the country's significant marine fisheries. However, small communities in Costa Rica, and especially within indigenous territories, depend on freshwater fish and invertebrates for food security, nutrition, culture, and social connection. Many of the marine fish that migrate into freshwater are also important food sources to these communities. If effective management of freshwater fisheries continues to be a low priority, the local communities' livelihoods will be at stake, especially within indigenous territories.

According to the Costa Rican law (Ley de Conservación de la Vida Silvestre No. 7317), only hook and line fishing is allowed in freshwater, for subsistence and sport fishing purposes. However, it is common practice to ignore these laws. Fishers regularly utilize illegal fishing gear such as spears, gillnets, venom, cast nets, and long lines to catch fish in freshwater. Unfortunately, due to a lack of data, it is hard to identify the extent of this problem. The mechanisms of enforcement appear to be more efficient in some regions than others, and the underlying reasons need to be evaluated on a case-by-case basis. There are two main potential factors 1) a lack of clarity on enforcement procedures, and management, administrative, and judicial competencies 2) a lack of sufficient government staff and resources to take care of the issue on a country-wide scale. In order to ensure the health of freshwater fisheries for the future, a more sustainable management approach that directly involves local communities in the decision-making process will be essential. Local people have a wealth of historical knowledge and most often are passionate about the specific issues that need to be resolved within their region. Involving the communities in the process will result in additional support and increased local capacity.

A strategic action would be to create community-managed protected areas in key locations to increase the efficiency of monitoring and enforcement. These protected areas could be designated in spawning and nursery areas, in illegal fishing hotspots, or in places that are logistically easy to access. Motivated communities could start gathering the currently lacking freshwater fisheries data, such as standardized fisheries-independent data. These protected locations could be attractive places for developing rural ecotourism and education programs. Then, replicating these protected areas in other parts of the watershed adjacent to interested communities, could enhance protection of important fish species for human use. Networks of protected areas would benefit fish migration corridors and increase species resilience by offering refuges of high-quality habitat. The benefits of community-based protected areas extend past biological and ecological importance. For example, the existence of these networks would increase the communities capacity for conservation and inspire collaboration. By unifying themselves with other communities, the smaller and more rural fisheries would have the opportunity to have a larger voice, potentially having more of an influence on policy-makers. Once collaborations have been established, communities may feel compelled or more confident to tackle other environmental challenges (agricultural management, deforestation, dam construction, and water quality) or social issues (human rights, economic alternatives, and culture).

Since late 2019, FISHBIO has worked, with financial support from CEPF, to identify groups in Costa Rica that are interested in implementing community-based inland fisheries management models similar to the Fish Conservation Zones (FCZs) implemented in SE Asia. FISHBIO identified high interest and need in two communities within the indigenous territory of Rey Curré: Las Vegas and Curré. For the past two years, FISHBIO has established a relationship with the indigenous territory government (ADI-Curré), local organizations and the local people, mapped out the key external actors that will need to be involved, and laid out the foundation to establish a freshwater protected area. FISHBIO has shared the SE Asia experiences with local communities, documented the perceptions of community members on watershed and fishery issues, mapped key river locations, established biological and socio-economic baselines, and started youth education and awareness efforts. The project culminated with a formal agreement from the ADI-Curré to pursue the establishment of a community-based fisheries management model with support from INCOPESCA (Costa Rican fisheries agency).

Preliminary steps have been taken towards the creation of the protected area, including: identifying and establishing coordination committees in Curré and Las Vegas; broadly defining the protected area's geographic boundaries, target species, and regulations; and conducting discussions with INCOPESCA about the procedure, including a draft letter to request support, which is currently under review by the ADI-Curré. At present, INCOPESCA has a small-scale fisheries co-management model called Responsible Fishing Areas (RFAs) that has been applied to marine fisheries, but never to inland fisheries. INCOPESCA proposed the creation of a new model, similar to the RFAs, but with considerations to fit characteristics of freshwater fisheries and indigenous territories. The Ministry of Environment (MINAE) and the Ministry of Justice and Peace (MJP) will also be involved in the establishment of the freshwater protected area. It will be the first initiative of its kind in Costa Rica, and the model will be intended to be replicable, and ideally adaptable to communities outside indigenous territories as well.

The declaration of the freshwater protected area and the design of the management plan will be accompanied by the following activities to ensure management effectiveness and to avoid any circumstance where the protected area could become a "paper park". This project will work with the Costa Rican government and the local indigenous communities involved to: (a) facilitate the creation of a novel freshwater protected area category: a community-based inland fisheries model; (b) build a management plan with the indigenous community and

INCOPESCA that will be applied to this protected area; (c) seek top-down support to improve the law enforcement process, and to build local capacities; and (d) prepare an accessible guidebook documenting the process with the intent to facilitate the replication of the model in other indigenous territories.

Key threats:

- Unsustainable illegal fishing methods affecting fish biomass and/or abundance.
- Poison fishing damaging ecosystem and people's health.
- Freshwater endemic and threatened species loss in unprotected tributaries.
- Lack of government support for enforcement.

Critical Opportunities

- Involving local communities that will engage and become more passionate about local inland fish conservation and sustainability.
- Creating the first community-based freshwater protected area of its kind in Costa Rica, and the first within an indigenous territory.
- Inspiring collaborations between freshwater fish conservation practitioners in Costa Rica.
- Facilitating enabling conditions for a freshwater protected area and connecting the proper collaborators will pave the way for other interested indigenous communities to establish their own protected areas in the future.
- Protecting habitats and/or reducing fishing pressure for at least 37 species of fish; and at least 5 species of freshwater shrimp (Picado Barboza 2022).
- Protecting habitats within the expected geographic range of 16 fish species that are endemic to a very small geographic area (pacific slope of southern Costa Rica and west Panama, Angulo 2021). Six are endangered, nine are vulnerable and one is near-threatened under the IUCN Red List. Five have been directly observed in the area to be protected. Note that one of the 16 fish species didnt have a UICN code and wasnt added in the endangered species section of this proposal. That species is Brachyrhaphis terrabensis, near threathened but with stable populations.

What would happen if the project were not implemented?

- Aquatic species will continue to decline
- Poison fishing will continue to target and cause decline of all sizes of shrimp, including juveniles, and other aquatic species.
- Endemic freshwater species will continue to be endangered with little actions for protection from poison fishing and restoring habitat quality.
- Freshwater fish of fishery importance will continue to be targeted without consideration of minimum catch size or reproductive seasons.
- Attention to freshwater fish issues will continue to lack
- The freshwater fish conservation local groups are small and are losing traction due to lack of funding and public interest. This project could spark new connections and renovate public interest.
- Lost opportunity: The local indigenous community, FISHBIO, and collaborators have worked hard over the last two and a half years to establish enabling conditions for freshwater protected areas. The local indigenous community has welcomed FISHBIO and INCOPESCA support and they are motivated.
- The health of the ocean and the rivers of Costa Rica are intertwined and connected. Therefore, the impacts of Costa Rican ocean conservation investments could decrease if the issues that current freshwater environments face continue to be ignored.
- Watershed management will continue to be minimal and little collaboration between freshwater and marine groups will continue to be the norm. Habitat degradation,

erosion, and pesticides will continue to wreak havoc in the Costa Rican watersheds and coastal areas, negatively impacting inland and coastal fisheries.

- Indigenous group voices will continue to be minimal in fish conservation and fisheries agendas.
- Management actions for marine species that enter rivers will be solely focused on benefiting coastal people, ignoring the importance of these resources for indigenous people living inland.
- Inland fisheries will continue to be overlooked, despite their critical importance to indigenous people living inland.
- Indigenous peoples' livelihoods, food security, and nutrition will decrease as the fishery resources continue to decline.

Approach

The project will have the following steps

1 Letter and agreement
2 Build support
3 Create the management plan proposal
4 Consultation process and revisions
5 Approval
6 Replication

1.Letter and agreement

ADI-Curré will finalize the draft letter of intent and send it to INCOPESCA. INCOPESCA will create a formal agreement of work with FISHBIO to support the ADI-Curré in the process

2.Build support

Building and increasing support from the government and the local people will be key to the success of establishing the protected area. For example, the Curré people are concerned with the existing illegal fishing enforcement process. They expressed frustration reporting illegal fishing because the authorities they call do not follow up. This may be related to lack of clarity on procedures and responsible staff within MINAE. Investigating the root cause of the lack of enforcement will be fundamental to the success and effectiveness of the potential freshwater protected area. Rey Curré leaders also expressed a need to build local capacities in enforcement and patrolling, and therefore will need training in these skills. They also expressed an interest in learning how to monitor a freshwater protected area and how to financially support it, yet another way that they can build their capacity. Rey Curré leaders are also concerned with the lack of connection between their youth, the river and surrounding environment. They expressed that it will be important for FISHBIO and the community to continue building awareness and emphasize the value of conservation, sustainable fishing, and endemic and endangered species.

Top-down support: Inter-institutional meetings with ADI-Curré, INCOPESCA, MINAE, and MJP will be held to accomplish the three following objectives: 1) clarify the illegal fishing enforcement process, 2) build a plan for capacity building training, and 3) start capacity building and training activities when possible.

Bottom-up support: The bottom up support will be additional activities that are not budgeted under this proposal. FISHBIO will seek to identify more local and indigenous river conservation leaders, and will continue with hands-on education and awareness activities, building from previous efforts started during the earlier project. FISHBIO will support the Rey

Curré river festival by including fish storytelling activities that rekindle local emotional connections with the fishery and highlight the need for conservation.

3.Create the management plan proposal

The management plan will be established with facilitation from FISHBIO and INCOPESCA, including the following:

- Setting up goals and objectives
- Determining management strategies
- Delineating the protected area boundaries (specific coordinates)
- Determining regulations and penalties
- Determining monitoring plan and indicators
- Creating patrolling and enforcement protocols
- Creating budget and financial mechanisms
- Determining the adaptive management process for protected areas
- Assigning roles and responsibilities

4.Consultation process and revisions

The Costa Rican government is obligated by law to carry out a consultation process with the representative from the indigenous people institutions whenever there is a project proposal that could involve or affect the indigenous livelihoods in any way (such as the creation of a protected area). The Instancia Territorial de Consulta Indígena (ITCI) is the governmental institution responsible for facilitating the consultation process and the Ministry of Justice and Peace (MJP) is responsible for supporting the technical and financial management part of the process. FISHBIO will be responsible for supporting the ITCI in communicating the protected area proposal to the indigenous territory.

5.Approval

After the Costa Rican government and the Rey Curré indigenous community have consulted, revised, and approved the management plan for the freshwater protected area, the plan will be submitted to INCOPESCA for the official establishment. From the start of the project and before the plans are submitted, INCOPESCA will be working with FISHBIO, ADI-Curré, MINAE, and MSP to set up the design of the new freshwater protected area management category that will be officially recognized by the Costa Rican government. The establishment of the first freshwater protected area process is expected to take 1.5-2 years, from submitting the letter of support to INCOPESCA, building the management plan, establishing the new category, and finally, declaring the official establishment of the protected area.

6.Replication

- The entire establishment process will be documented by FISHBIO, and a step-by-step guide will be produced and distributed among other indigenous territories to assist them in replicating the process in their own territories if they choose to do so.
- The process will also be shared with other indigenous territories through in-person meetings or webinars.
- A webinar will be conducted with other aquatic biologists in Costa Rica to talk about the establishment of a freshwater protected area process, how to replicate the model in other locations, and how to document perspectives.

8. Date of preparation of this document.

August 3, 2022.

9. **Legal and regulatory framework**: This section will analyze the legal and institutional framework for the project, within which the environmental and social assessment is carried out, in compliance with Safeguard Policy 1 on Environmental and Social Assessment.

This project will be carried out within an indigenous territory in Costa Rica, Rey Curré. The government of this territory is the Asociación de Desarrollo Indígena of Rey Curré (ADI-Curré). Another important entity is the Instancia de Consulta Territorial (ITCI). Both are involved in the project since 2020 when FISHBIO started to work with the territory.

The indigenous territory is located in Costa Rica and thus influenced by the Costa Rican government. This project seeks to create a new protected area for fisheries management, and consequently, is coordinating with the Instituto Costarricense de Pesca y Acuacultura (INCOPESCA) and will involve the Ministerio de Ambiente y Energía (MINAE) and the Sistema Nacional de Areas de Conservación (SINAC), which are the entities focused the environment protection in Costa Rica.

The creation of a protected area will require a process of consultation within the indigenous territory led by the ITCI Curré in coordination with the Ministerio de Justicia y Paz (MJP). Therefore, MJP will also be involved in the project.

10. **Status of area to be impacted:** This section will describe the applicant's understanding of the project site, including a concise description of the proposed project's geographic, environmental, social, and temporal context. Where possible, it should include a map of sufficient detail, showing the project site and the area(s) that may be affected by the project's direct and indirect impacts.

The freshwater protected area will be established in the Rey Curré indigenous territory, a territory of the Bruncaj people located in the province of Puntarenas in Costa Rica, at an altitude of 70 meters above sea level. The first indigenous ancestors of Rey Curré are known to have settled approximately 3,500 years ago adjacent to the Térraba River. The river was key for navigation to connect with other communities at different altitudes, but the navigation tradition has been lost. Rey Curré is situated in mountain terrain with steep hills that descend to the river. The Térraba river in Curré meanders and deposits nutrients on the river beaches with important nutrients for the development of agriculture, and it holds rich fishery resources that are still an important source of protein to this date.

The construction of the InterAmerican highway next to the river was built around the decades of 1950-1960. The changes brought colonization of the lands by non-indigenous people and changes in the use land to farms for raising cattle, and different fishing practices. Unfortunately, deforestation and unsustainable fishing practices started to become more common. Currently, there are many illegal and destructive fishing activities (for example, fishing with poison and fishing with gill nets), that are causing damage to the health of the ecosystems and species. The people of Rey Curré, during workshops with FISHBIO reported that they perceive a decline in the fishery resources, and that less wildlife visits the rivers.

Rey Curré at present faces big challenges, the population is growing but there is scarcity of land to build houses. They are in the process to recover indigenous land that was taken away. It is necessary to diversity the employment opportunities, as well. There has been investment in education but there are few local job opportunities. The people still depend in great extent on the food security provided by the land crops and the river fisheries.

Is in this context that this project seeks to revitalize Rey Curré's historical and cultural connection with the river and its resources. The protected area is meant to encourage sustainable fishing practices and protecting the critical life stages for the reproduction of the species. It will also be a strategic action to associate with potential ecotourism and cultural tourism initiatives by the local people. They want to do reforestation near the rivers with native tree species that are utilized by freshwater fish for food and/or shelter. The project will protect approximately a 7-km stretch of the Térraba River, the largest river of Costa Rica. The protection will be community-based and has been proposed to their best interest and by their own initiative.

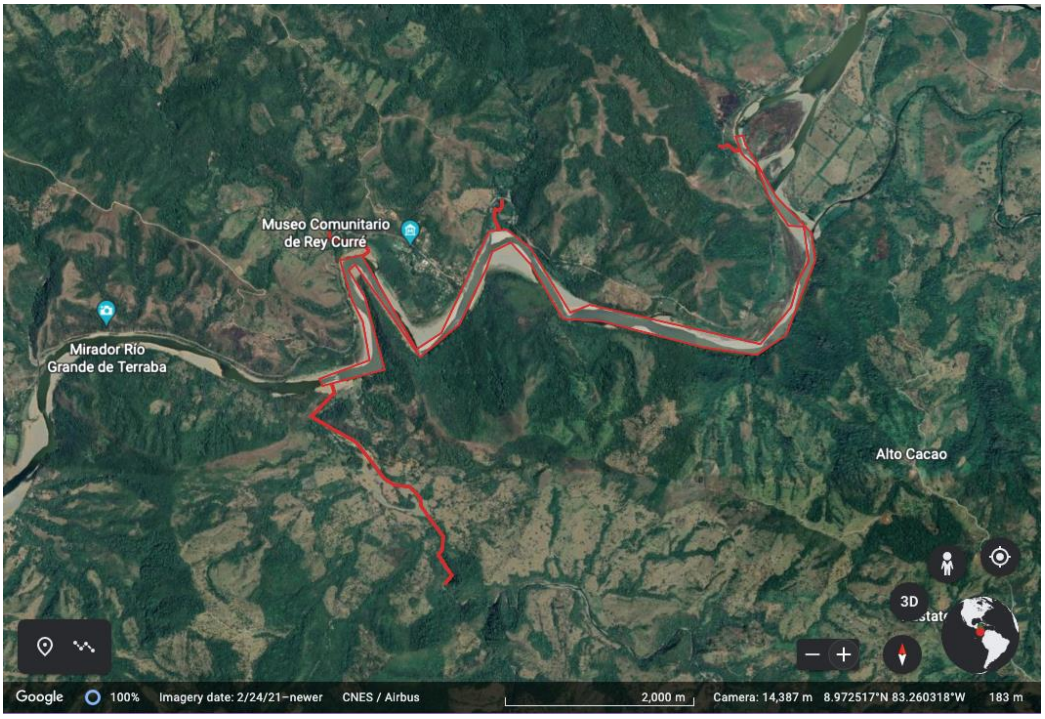

Figure 1. Section of the Térraba River and tributaries that will be protected under this project.

References:

Angulo, A. 2021. New records and range extensions to the Costa Rican freshwater fish fauna, with an updated checklist. Zootaxa, 5083 (1), 1-72.

Corrales Ulloa, F., Rojas Rojas, U. 2021. Curré/Yimba. Su larga y profunda historia. Museo Nacional de Costa Rica. San José, Costa Rica. 100 p.

Picado Barboza, J. 2022. Muestreo participativo de fauna acuática (peces y camarones). Informe Final para FISHBIO. 31 p.

11. **Baseline data**: This section will assess the dimensions of the study area and describe relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences. It will also take into account current and proposed development activities within the project area that are not directly connected to the project. Data should be relevant to decisions about project location, design, operation, or mitigation measures. The section will indicate the accuracy, reliability, and sources of the data.

Rey Curré is an indigenous territory (10,600 ha) in the Puntarenas province of Costa Rica inhabited by the Bruncaj people, with a population of approximately 1,000 people. The territory has 11 rural communities located close to the Térraba river and tributaries. The center of Rey Curré is directly adjacent to the Térraba River, known by the Bruncaj as Dí Crí, which means big water. This is the largest river of Costa Rica (160km), from the center of Rey Curré it flows 50 km downstream towards the Pacific ocean, passing through the Térraba-Sierpe wetlands, the largest mangrove system of the country (and a RAMSAR site). The section of the river and tributaries that are situated in Rey Curre have at least 37 species of fish; and at least 5 species of freshwater shrimp. There are 16 fish species expected within the geographic range of the river, these species are endemic to a very small geographic area (Pacific slope of Southern Costa Rica and West Panama). Six are endangered, nine are vulnerable and one is near-threatened under the IUCN red list. Five have been directly observed in the area to be protected.

We will be working with the communities of Curré and Las Vegas located inside the Rey Curré territory. A whole household in these communities earn much less than $380 dollars per month, and their livelihoods need to be supplemented by agriculture and fishing. In both communities there is a subsistence fishery that is most active in the dry season, and the agriculture provides food security during other times of the year. However in Las Vegas there is more dependency on fisheries year-round. Within the whole Rey Curré territory, the fishing is done from shore, and occasionally from artisanal rafts. This is a multispecies fishery, but the most common and abundant catch is machaca (*Brycon beherae*), a strictly freshwater fish. Coastal species that swim to freshwater to feed such as snooks (Centropomidae), grunts (Haemulidae) and snappers (Lutjanidae) are highly sought after. Various types of shrimp are also part of the fishery, especially *Macrobrachium* spp. and maruchas (*Atya* spp). The most common gears used are hook and line, variations of line fishing, cast nets, gill nets, seine nets, and spear guns. Legally, the only allowed fishing gear in Costa Rican continental waters is the hook and line, but this is far from the reality, as other types of fishing commonly occur here and elsewhere in the country. In particular, the application of chemicals to poison shrimp happens regularly at Rey Curré, it is of concern and needs management. The regulations of fishing gear are rarely enforced, and there are no other local management regulations (no regulations of size, season or species), and no existing freshwater protected areas.

The value of the fisheries goes beyond food security. Historically the fish, shrimp and the Térraba river have been important to the culture of Rey Curré and nearby indigenous territories. In particular, the Di Crí river is considered a sacred place, and it is of spiritual, recreation and identity value. Nearby indigenous territories also consider some of the fishery species of spiritual and/or medicinal value.

We see this project as a key component of the "puzzle" for healthier ecosystems and fisheries in the Térraba watershed. This protected area proposal is a source of inspiration for the local people of Rey Curré, and they are already proposing entrepreneur ecotourism

projects associated to this future protected area. This protected area can be an example for other local communities along the watershed to protect and restore the fishery resources while improving their livelihoods. More importantly, it will allow to have critical discussions with government entities to improve freshwater fisheries management and fill important legal and enforcement gaps.

Important developments in Rey Curré that are ongoing parallel to this effort are 1) the recovery of indigenous lands, 2) projects related to payment of environmental services for protecting rainforest, 3) projects that are encouraging ecotourism developments within indigenous territories.

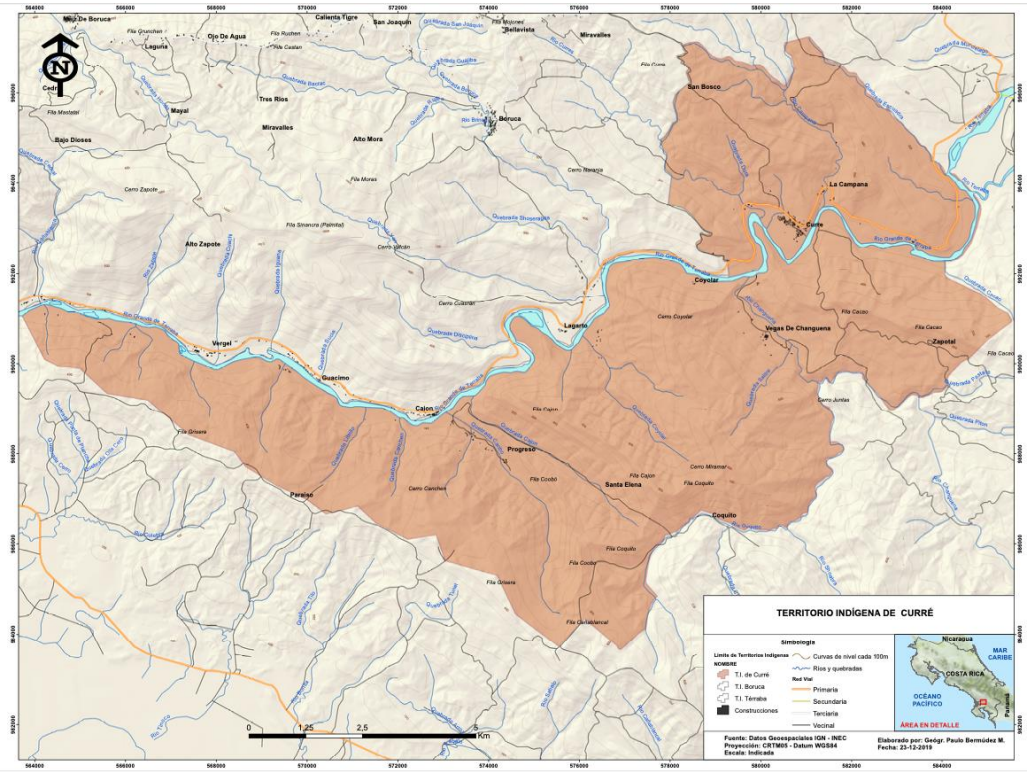

Figure 2. Map of Rey Curré indigenous territory.

Table 1. Socioeconomic statistics of Rey Curré indigenous territory.

Territory	Population size	No. Households	% of households that do at least one farming activity	Population employed in agriculture	% of men in agriculture	% of women in agriculture
Curré	1,089	311	57.9	227	92.3	7.7

References:

Instituto Nacional de Estadística y Censos. 2013. X Censo Nacional de Población y VI de Vivivenda: Territorios Indígenas. Instituto Nacional de Estadística y Censos. San José, Costa Rica. 56 p.

IUCN. 2022. The IUCN Red List of Threatened Species. Version 2022-1. https://www.iucnredlist.org. Accessed on [01 08 2022].

Picado Barboza, J. 2022. Muestreo participativo de fauna acuática (peces y camarones). Informe Final para FISHBIO. 31 p.

12. **Anticipated impacts and risks:** This section will describe the anticipated environmental and social impacts and risks, and explain how these have been determined. It should consider both positive and adverse impacts.

Environmental impacts:

This project will have a positive impact on the environment by encouraging sustainable fishing practices within the proposed protected area.

Social impacts:

Unsustainable fishing practices can provide larger numbers of fish due to the increased ability to catch them. However, these practices are the ones that are reducing the fish populations with detrimental consequences for food security on the long term. The change in practices can affect the livelihoods of the people that depend on them. These practices are not very common and thus the changes will only affect a few households (the majority of local people practice sustainable fishing).

13. **Mitigation measures**: This section will describe measures that will be taken to mitigate adverse impacts. For each anticipated adverse or risk identified in Section 12, it should describe, with technical detail, appropriate mitigation measure(s), including the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate. It should also estimate any potential environmental and social impacts of these measures. Differentiated measures should be identified so that adverse impacts do not fall disproportionately on disadvantaged or vulnerable groups or individuals.

- Before the start of this project, there have been measures to discover adverse impacts of the establishment of this protected area. Since 2020, during each meeting, workshop and interview, FISHBIO and consultants asked about potential impacts to the local communities and also provided the grievance mechanism. To date, the local people have not presented any negative impact to the establishment of the protected area, during any of the workshops or activities that have taken place since 2020. To date, FISHBIO has obtained prior informed consent by the local government (ADI-Curré) to work on this project, and there has been a commitment during an assembly meeting in late 2021 to move forward with the creation of the protected area with support of the Costa Rican government institutions.

- An important component of this project will be to implement the consultation process regarding the protected area and its management. The management plan will be reviewed during the indigenous consultation process to maximize benefits while minimizing adverse impacts. The indigenous consultation paired with the grievance mechanism will help discern if there are significant impacts unaccounted for.

- As part of the monitoring plan of the new protected area, the community will be trained to monitor socioeconomic and environmental conditions with the support of FISHBIO, a social science consultant and the government authorities. The goal would be to detect socioeconomic and environmental impacts (positive or negative) after the implementation

of the protected area. The protected area will have an adaptive management as part of its core. This means that changes to management could be implemented to reduce any socioeconomic significant impacts detected. Likewise, if the protected area is not effective for improving fisheries or wellbeing, changes to management could be implemented as well.

14. **Actions to ensure health and safety**: This section will describe actions that will be taken to ensure the health and safety of workers.

COVID-19 pandemic health risk:

Due to the COVID pandemic, virtual meetings will be carried out whenever possible. When in person meetings are needed, masks and disinfectant will be available on meetings and workshops. These will be carried out on open spaces, or spaces with plenty of outdoor air flow. Large gatherings will be only organized if strictly necessary. If consultants or project participants feel sick, they will not attend the meetings.

Aquatic safety risks:

To reach Las Vegas community there are two pathways, one using 4WD and another one crossing the river by boat. Crossing by boat is closer and doesn't require 4WD. Thus, most meetings will be planned during the dry season or early in the rainy season to avoid potential safety issues crossing the river. If needed we will use the alternative route to connect using 4WD, or we will change meeting times or locations. Weather and river condition and potential for floods will always be evaluated before any travel.

15. **Monitoring and evaluation**: This section will outline the steps the applicant will take to monitor and evaluate the impact of the proposed project. It should identify the monitoring objectives and specify the type of monitoring, with linkages to the impacts assessed and the mitigation measures described. This is meant to provide (a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (b) monitoring and reporting procedures to: (i) ensure early detection of conditions that necessitate particular mitigation measures; and (ii) furnish information on the progress and results of mitigation.

The monitoring plan of the protected area will include

1) Biological monitoring, with the objective to assess fishery and habitat changes due to the establishment of the protected area.
    a. Fish abundance, diversity and biomass: Fishery dependent data: Recording species catch and lengths to determine fish biomass and size distribution. Fisheries independent data: cast nets and snorkel surveys to estimate diversity and abundance in at least 5 key locations. Monitoring will be implemented at least once a year, the first year will be the baseline conditions.

b. Habitat quality: Describe the habitat structure surrounding at least 5 key locations within the protected area, and take water quality measurements at least once a year, the first year will be the baseline conditions.

2) Semi-structured interviews with households of Rey Curré and Las Vegas, with the objective to assess socioeconomic impacts of the protected area, aiming to interview at least 30% of the population of Curre and Las Vegas. It aims to measure changes in household consumption of fish, satisfaction with the implementation of the protected area, and wellbeing impacts and concerns. Monitoring will be implemented at least once a year, the first year will be the baseline conditions.

16. **Timeline and resources:** For the mitigation and monitoring measures in Sections 14 and 15, this section will provide: (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) cost estimates and sources of funding for implementing the ESMP.

Implementation of the monitoring plan will take place once a year once the protected area is implemented, starting with volunteers from the local communities. FISHBIO will coordinate with Rey Curré to estimate associated costs and identify sources of funding to maintain the running of the protected area and be able to continue these monitoring efforts once a year. A baseline socioeconomic and biological study is already in place to compare with.

17. **Permission of the landowner**: Please obtain permission of the landowner to undertake actions on the site, and verify that you have the required permits to undertake this work.

We have the prior informed consent from ADI Curré and approval to implement this project.

18. **Participatory preparation**: This section aims to outline the range of meaningful consultations that you have had both with experts to optimize the potential for success, and with stakeholders, particularly local communities, who are potentially affected by the proposed project. It should include dates of consultations.

Two and a half years before the start of this project were dedicated to consult with the local people of Rey Curré and build the bases of this project, and at least 120 people from Curré and Las Vegas participated actively in the different workshops and participatory fish monitoring activities. The local government, ADI Curré and the Instancia de Consulta Indígena (ITCI) of Curré have been involved since then.

20. **Disclosure**: CEPF requires that environmental and social plans are disclosed to affected local communities and stakeholders prior to project implementation. Please describe efforts to disclose this impact assessment and environmental management plan and provide dates.

This assessment will be translated to Spanish and shared with the ADI Curré and the ITCI-Curré at the start of the project by Feb 2023.