



ITM INDIGENOUS TERRITORIAL MANAGEMENT

▶ T A C A N A INDIGENOUS PEOPLE

**BREEDING GROUNDS OF
ECOLOGICALLY AND ECONOMICALLY
IMPORTANT FISH SPECIES**



Guido Miranda/WCS

The piraíba (*Brachyplatystoma filamentosum*) breeding grounds in the Amazon

The piraíba is one of the largest freshwater fish in the world, reaching up to 360 cm in length and 200 kg in weight. At the end of the 1970s, the species accounted for 94% of fish landings (catch) in the Amazon region, while in 2005 it represented just 5%. This drastic reduction in catch volume is a result of serious overfishing and unsustainable management of the species.

Piraíba are known for their long distance migration from the estuaries of the Amazon, moving up wide and fast flowing rivers towards the headwaters in the Andean foothills. The species migration routes, populations, and life strategies are not fully understood. Their reproduction is known to occur between July and September, when females produce more than 560,000 eggs.

Julie Larsen/WCS



The Tacana indigenous territory in Bolivia represents an important breeding ground for the piraíba due to its location in the watersheds of the Beni River. Between 2001-2007, fishermen conducted monitoring in the Cachichira, San Antonio del Tequeje, San Miguel, Carmen del Emero, Copacabana, and Altamarani communities. That effort documented the importance of fishing to Tacana households. Seasonal variations in fishing and the dynamics of fish populations in the region were analyzed using data on the number and size of fish caught. The study of the monthly fluctuations in the size and weight of Piraíba fished by communities showed that these increase with the seasonal decrease in the water level of the Beni River. The largest fish were captured during the dry season, while fish caught during the wet season tended to be smaller.

The presence of individuals of diverse sizes suggests that piraíba populations use the watershed of the Beni all year round. Further studies are required to expand our understanding of the population dynamics related to the migration processes of the paraíba and other migratory catfish, as well as the interconnections between the different Amazon watersheds in Bolivia.

The Andean foothill geological formations within the Tacana indigenous territory and the Madidi National Park are potential areas for breeding and could be vital for the conservation of the paraíba, and possibly other catfish species.

The study highlights the role of the Tacana indigenous territory in the protection of nursery grounds of this commercially important species. However, it also warns that the construction of hydroelectric dams along the migratory routes of the piraíba could cut connections between the Madre de Dios, Mamore and Beni Rivers, thereby preventing migratory fish populations in the lower watersheds from reaching optimal breeding sites.



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The massive migration of juvenile "chipi chipi" catfish

In 2015, the Wildlife Conservation Society reported a unique phenomenon on the Beni River: the massive migration of *Trichomycterus barbouri* juveniles, a small pencil catfish. Called chipi chipi ("the smallest," in the Tacana language), these fish travel through from the Amazonian flood plains to the Andean foothills.

The juvenile pencil catfish measures 33 mm and weighs 0.38 g. In a period of 30 days, it achieves the incredible feat of swimming more than 370 km against the current up the Beni River. One of the most important results of the study is the magnitude of effort employed by such a small species in relation to its weight and the distance it travels. Among freshwater fish, it achieves that greatest migration effort for reproduction per km.

At the height of the wet season, after floods caused by the overflow of the Beni River, tens of thousands of *Trichomycterus barbouri* embark together on a long journey that begins in the nursery grounds of the Beni's floodplains. They travel upstream to the Andean foothills, above the confluence of the Kaka and Alto Beni Rivers. The "chipi chipi" cross the narrow and fast flowing Suse and Bala straits near Rurrenabaque, in the last foothills of the Andean mountain range. At this point the schools of fish move along the rocks of the banks, climbing and holding onto them with their tiny teeth.

A network of Tacana observers located at different points along the Beni River made it possible to estimate the routes and times of migration. These were subsequently supported by photographic and film evidence. The "chipi chipi" belong to a very singular genus. Species of this group have been reported in caverns and hot springs and are distributed in different ecological regions. It is not yet known whether the migratory behavior of the *T. barbouri* migration is unique or shared by other populations of the same species in other basins.

The benefits of mass migration for the survival of the *T. barbouri* remain to be understood. One hypothesis is that upstream spawning occurs during the rainy season and that the eggs are washed away by the stream to the floodplain. When the waters begin to drop, the juvenile fish return to the main river channel before being disconnected, and at that moment the juveniles begin their migration upstream. This effort may be a strategy to avoid predation.

In addition, the moment of migration is important for the fishing communities living on the banks of the Beni River, especially in Rurrenabaque. The fish are easy to capture as they move in easily detectable groups (schools). These fish are sold in the regional market, contributing to the local economy and food security.

The presence of migratory catfish – from the smallest such as the "chipi chipi" to larger fish such as the piraiba and the dorado (*Brachyplatystoma rousseauxii*) – in the fishing areas of the Tacana is an indication that these flooded areas on the Beni River act as breeding areas and as such contribute to the conservation of these species and ichthyofauna in general.

The documentation of migration processes in the Beni River basin, protected in part by the Tacana indigenous territory, demonstrates their importance for maintaining the connectivity needed by species that migrate locally and regionally. The migration of fish is a complex phenomenon to understand, but it is clear that these species need thousands of kilometers of connected rivers, floodplains, and headwaters to survive and reproduce. The modification and disturbance of connecting migratory routes can trigger a series of events ranging from the local extinction of species, to the decrease in abundance of others, to the loss of food sovereignty of local people, and other unpredictable ecosystem alterations.

FISH BREEDING

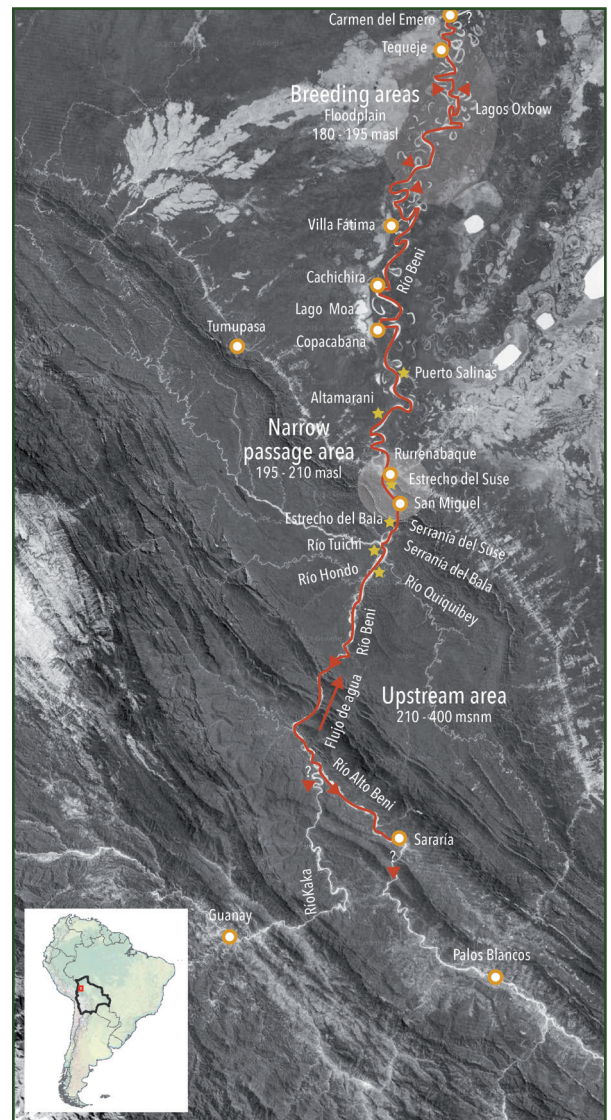
Migratory fish travel great distances along the rivers of the Amazon, reaching even the headwaters in the Andean foothills. Maintaining the connectivity of these migratory routes helps to conserve fish species by allowing interactions with other species and ensuring reproductive migratory routes. It also contributes to the food security of the Tacana people and supports their life systems. The management of the Tacana territory is essential if the breeding grounds of ecologically and economically important fish species are to be maintained.

Protecting the breeding grounds of piraíba and *chipi chipi*

- The Tacana Indigenous Territory safeguards piraíba catfish breeding grounds.
- Piraiba travel migratory routes that run from the Amazon estuary to the headwaters in the Andean foothills.
- Piraiba catfish are an important part of the diet of local Tacana populations.
- La piraiba is also commercialized and contributes to the local economy.
- The conservation of the piraíba requires the connectivity of migratory routes.
- The Tacana Indigenous Territory helps maintain the necessary connectivity for the migration of the piraiba and other migratory catfish species.
- A small catfish known locally as the "*chipi chipi*" travels from more local flood plains to foothill headwaters to reproduce.
- The flood plains of the Beni River act as nursery grounds and contribute to the maintenance of the "*chipi chipi*" and fish life in general.

THERE ARE IMPORTANT FISH BREEDING AREAS IN THE TACANA INDIGENOUS TERRITORY

Migration of the "*chipi chipi*" along the Beni River



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