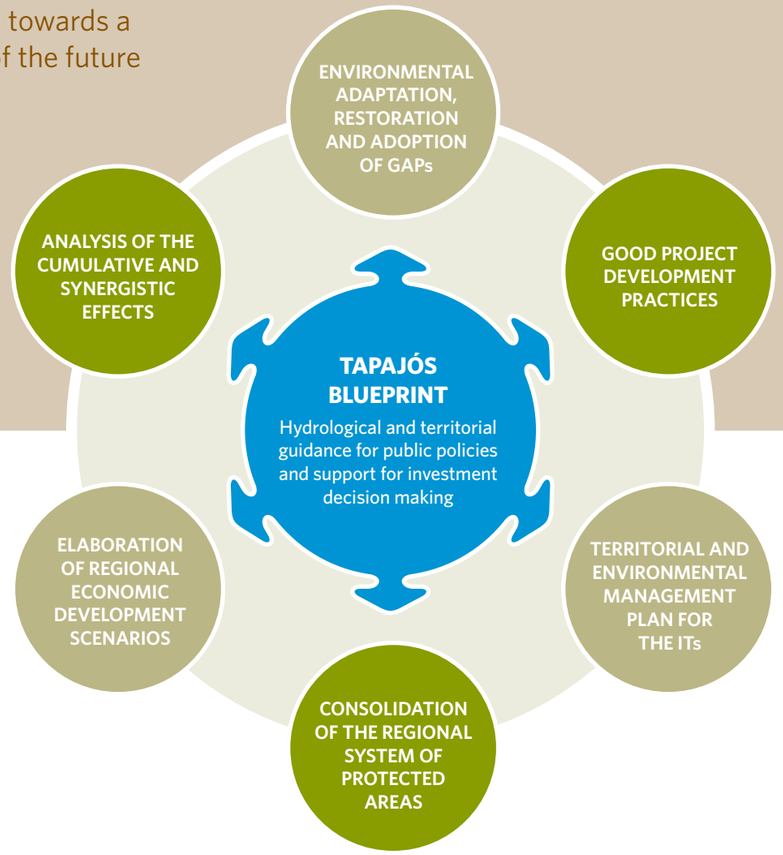
## Next Steps in Moving towards a Shared Vision of the Future for the Tapajós

- Incorporation of biological information and its validation in the field, to underpin a vision of the conservation of the Tapajós river basin, is being developed by the MPEG (Emílio Goeldi Museum of Pará).
- Consistency analyses of the efforts conducted by TNC, with systematic planning of the conservation of the Tapajós river basin developed by the WWF.
- Incorporation of the dynamics of social elements involving riverside communities and settlements, among others.
- Sharing information and assumptions of the joint efforts of the WWF, MPEG and TNC with regional stakeholders (government, industry, traditional populations, etc.), to obtain feedback that leads to new adjustments and social validation of the results of a vision for the future of the Tapajós.
- Study of areas that will naturally be affected by climate change.
- Mapping of ecological services, especially fishing, and of sacred sites or those that are important to the cultural and historical heritage.
- Mapping of migratory routes, particularly to the Juruena, based on systems that combine telemetry with radio and acoustics.
- Political support and engagement of civil society and significant stakeholder groups to advocate the need for an integrated vision for the future of the Tapajós river basin, as a prerequisite for the licensing of any enterprise or set of enterprises in the region.

## Possible action towards a shared vision of the future for the Tapajós

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The Nature Conservancy

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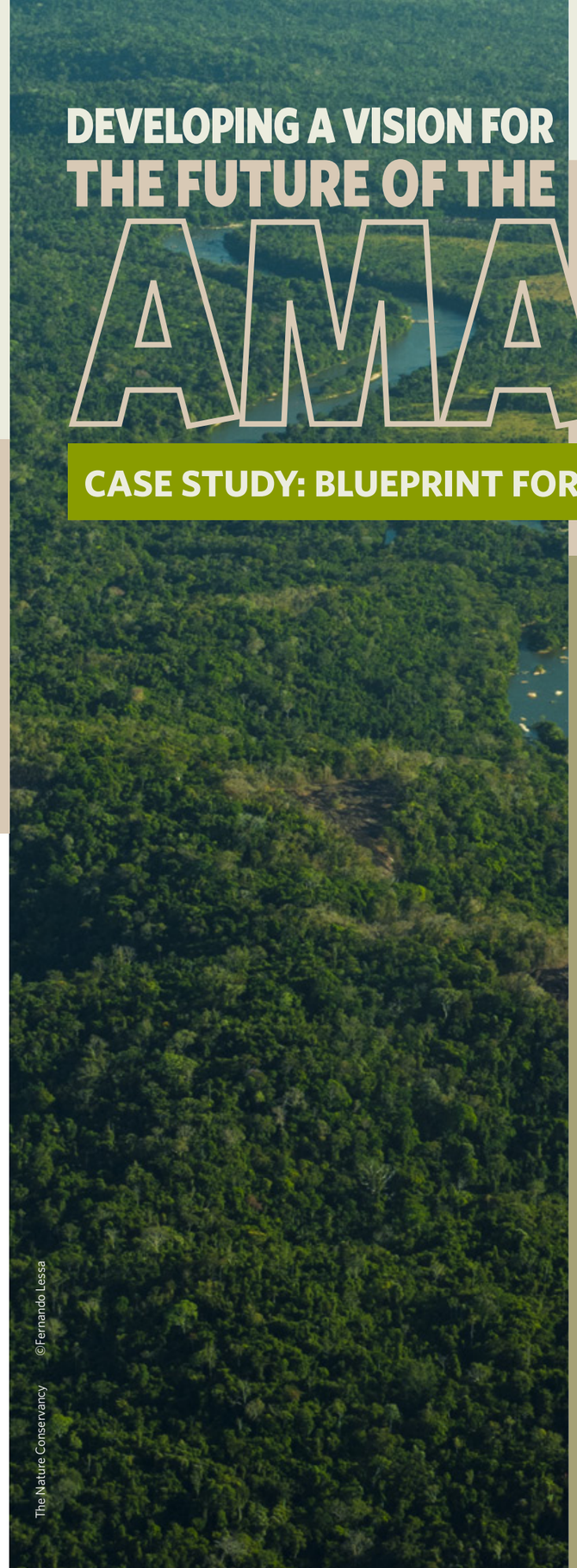
*The mission of The Nature Conservancy (TNC), the world's biggest environmental conservation NGO, is to preserve the land and water that is essential to life.*

# DEVELOPING A VISION FOR THE FUTURE OF THE AMAZON

## CASE STUDY: BLUEPRINT FOR THE TAPAJÓS RIVER BASIN




### How does one deal with multiple economic investments in the Amazon?

Conventional environmental impact analysis, based on a case-by-case approach, has not been sufficient to meet the challenges presented by recent development projects in the Amazon. In fact, the scale and multiplicity of economic investments, in particular, in regional infrastructure requires an integrated environmental vision that is capable of addressing the cumulative and synergistic effects of the projects.

The most obvious example of such a scenario is the Tapajós river basin. The planned infrastructural investments include dozens of hydroelectric plants and their transmission lines and multimodal transport systems, involving road and rail options and transshipment terminals that would increase the use of the rivers Tapajós and Amazon as waterways. Major mining projects and a new cycle of advancing the agricultural frontier, driven by more competitive logistics, can also be considered potential threats to the region's future.

When there is an integrated strategic vision of a shared future for the Amazon catchment area, it paves the way not only for the determining of criteria to address the cumulative and synergistic effects, but also for the consolidation of a framework to guide the sustainability of public policies and defining of the limitations on the regional development. The integrated vision presented herein by The Nature Conservancy (TNC) for the Tapajós river basin underpins a key step for a strategic environmental assessment (SEA) or integrated environmental assessment (IEA) on the scale of a river basin, where not all the projects will qualify for the conventional treatment of an environmental impact study.

The Nature Conservancy

Protecting nature. Preserving life.

# Developing a Vision for the Future of the Tapajós River Basin

The scientific construction of a spatial vision for the future of the Tapajós river basin requires the determining of an objective function, which is to say, a purpose that should be guaranteed for the future, as well as criteria for choosing the set of ecological systems that best serves that objective.

In metaphorical terms, the criteria for choosing the set of ecosystems that serves the objective function is similar to the hypothetical criteria used to fill Noah's Ark, given the physical limitations and conservation challenges, or in other words, an efficient, representative, resilient and functional sample of the diversity of species living at the time.

Noah's Ark (1846), by Edward Hicks

In most exercises geared to a vision of the future for a certain geographical area, sometimes referred to as systematic conservation planning, the objective function has the aim of achieving the most efficient conservation of the set of terrestrial ecosystems that is possible. It takes into account the cost-benefit ratio (risk/opportunity to preserve a given ecological system), which best represents, in the light of its integrity, the remaining heterogeneity observed in that territory, as a substitute for biological diversity, about which there is no full, formally systematized knowledgeŽ.

In the first "blueprint" developed by TNC for the Tapajós river basin, the objective function was not terrestrial, but aquatic, aimed at sustaining the region's hydrological process. If, on one hand, environmental integrity is significant to terrestrial conservation, it is not necessarily critical to sustaining the hydrological process, since, although areas with permeable soils and favorable relief may not have good vegetation cover, for example, they can still contribute towards the hydrological target.

As a result, TNC's development of the blueprint for the Tapajós river basin not only sought to identify areas that should be a conservation priority, but also those of greatest interest for restoration or the promoting of good agricultural practices (GAPs) that do not impair the region's hydrologic function.

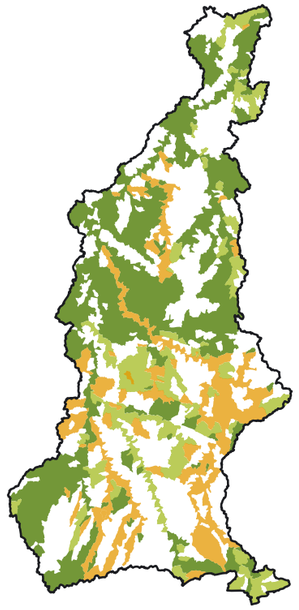
Considering also the congruence between the carbon stock and the wealth of terrestrial biodiversityŽ , which would obviously apply to cases of high integrity in the condition of the ecosystems, leads to the suggestion of a significant potential for synergy between the strategies for conservation and for mitigating climate change in the Amazon.

[1] Although maps showing the distribution of species and habitats may also be used to generate and/or validate analysis and representation targets when choosing areas as a priority for conservation. [2] For more details, see Strassburg et al. "Congruence of Carbon Storage and biodiversity in terrestrial ecosystems", Conservation Letters (2010), Wiley Periodicals http://onlinelibrary.wiley.com/doi/10.1111/j.1755-263X.2009.00092.x/full

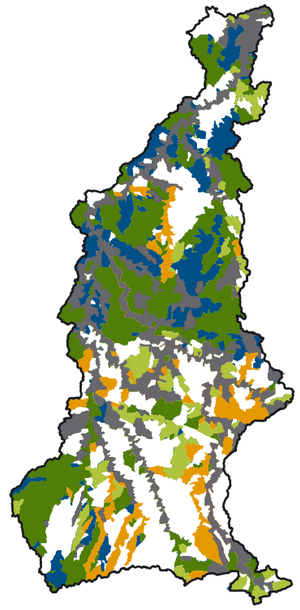
# Protecting the future of the Tapajós river basin at Três Passos


- Tapajós Basin
- Priority Areas of the water system: High Integrity
- Priority Areas of the water system: Medium-High Integrity
- Priority Areas of the water system: Low Integrity
- Lands System: Additional areas of aquatic systems
- Single-instance planning unit (unreplaceable)
- Conservation Unit (CU)
- Indigenous Lands (IL)

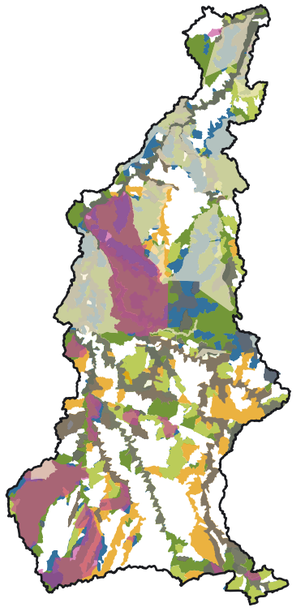
**1º step:** Select from within the river's active areaŽ the ecological systems that best contribute to sustaining the hydrological process and water connectivity (TNC water "blueprint").



**2º step:** Select the terrestrial ecological systems that are of interest because they most efficiently complement the hydrological target, which is to say, show the best cost/benefit ratio (risk/opportunity in terms of conservation)Ž.



**3º step:** Take into account the system of protected areas and territories of indigenous peoples (ITs), so as to identify priority areas for conservation, restoration and good agricultural practices (GAPs)Ž.



[3] Defined by the most extensive flooding over the previous 100 years. [4] Single ecological systems highlighted, for both hydrological and terrestrial interest. [5] Excluding the Tapajós APA (Environmental Protection Area).

# Preliminary Environmental Management Considerations deriving from the Blueprint

**General**

The strategic issues that arise for the states of Pará (lower and middle Tapajós) and Mato Grosso (upper Juruena) are very different.

For Pará, the most critical issues are the lack of legal protection of the upper Jamanxin and the advanced state of degradation of the Tapajós APA, due to mineral exploration and the inevitable consequences for the quality of the water and human health. Efforts to consolidate, manage and expand the system of protected areas are therefore a priority, with a notable conservation role performed by Munduruku IT.

For Mato Grosso, the territories of the indigenous peoples (ITs) are the most important areas of high ecological integrity in the tropical savanna-forest transition, as well as being the only areas that have been officially designated for the protection of the Parecis aquifer. The Alto Teles-Pires region is also a priority area for conservation that is not yet formally protected. Restoration and the promotion of good agricultural practices (GAPs) that do not further impair the region's hydrological process are important priorities, particularly along the rivers Arinos and Teles-Pires, respectively.

**For Hydroelectric Development**

Due to the impact on alluvial forests and specific habitats (especially rapids), any development of the hydroelectric potential of the rivers Tapajós and Jamanxin will jeopardize the future of the biodiversity in the Tapajós river basin.

Given the role of the territories of the indigenous peoples (ITs) in the upper Juruena region, any major development of small hydroelectric plants in that area represents a risk to the natural resources portfolio of the Tapajós catchment area.

Promoting discussion and implementation of territorial and environmental management plans (PGTAs) in all the territories of the indigenous peoples in the upper Juruena region is urgently needed. Although, from the perspective of the flooded area, the hydroelectric development in the lower Juruena offers a better alternative than those on the River Jamanxin, its impact on water connectivity and the routes of migratory species in the middle Tapajos would be significant.

Similarly, damming the River Arinos in the upper section of the basin would have a regional fragmentation effect that is proportionally much greater than the increase in hydroelectric generation, especially if the Jamanxin and lower Juruena rivers remain free.

**For Regional Logistics Development**

The transshipment terminals (trucks to barges) that are to be set up along the River Tapajós, near the municipality of Itaituba, need to be analyzed from the perspective of the mitigation hierarchyŽ , taking into account the cumulative and synergistic effects.

To this effect, there must be a package of social, environmental and economic activities geared to the increase in the traffic of trucks and barges on the BR-163 highway and the River Tapajós, in order to **mitigate** the cumulative impact of those terminals. Alternatively, if the railroad option (Ferrogrão), intended to connect the north of Mato Grosso state to the terminals on the Tapajós, comes about there will be a significant reduction in the use of trucks.

The same reasoning applies to **offsetting** the cumulative effects, sharing the social and economic benefits of the most viable alternative with the local and riverside communities.

The **avoiding** of projects should be determined by an upper limit on the number of transshipment terminals for barges, setting an upper limit on the number of hectares devoted to the sustainable production of grains within the area of influence of the multimodal transport system (known as the "Northern Exit"Ž), conditional upon the adhering of those hectares to the zero deforestation objectives and adaptation to the Forest Code and the Tapajós "blueprint".

[6] This is a scientific approach that has already been tested and applied by TNC, which aims to avoid, minimize or offset the impacts of new infrastructure projects. [7] In a northerly direction on the BR-163 highway and the lower Tapajós and Amazon rivers, as far as the transshipment terminals for long distance barges and ships that are to be set up on the River Pará, near the mouth of the River Amazon.