

Connectivity First: *Free-Flowing Rivers for the Brazilian Amazon*

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Summary

The **connectivity** of Amazonian aquatic ecosystems is a strategic ecological and territorial condition for the Brazilian Amazon. Free-flowing rivers constitute a critical ecological asset for the country and should be treated as central assets of Brazil's environmental, water, and territorial policies. This analysis identifies **19 rivers that are crucial to the connectivity of the Brazilian Amazon**¹ and the wider Amazon Basin.

Key takeaways



19 rivers were identified for maintaining connectivity across the Brazilian Amazon.



These rivers sustain **ecological and socioeconomic processes of fundamental importance**.



River connectivity can no longer be protected only indirectly; it must be recognized as an **explicit objective of conservation and planning**.



The fragmentation of the rivers identified in the Brazilian Amazon should be avoided by guiding infrastructure planning in a way that preserves its connectivity.



While this analysis focuses on the Brazilian Amazon, **it explicitly recognizes the transboundary nature** of the Amazon Basin.

Introduction

The connectivity of aquatic ecosystems is fundamental to the functioning of the Amazon. It maintains the flow of water, sediments, nutrients, and biota, connecting rivers, tributaries, floodplains, and wetlands, while sustaining biodiversity, fisheries, and the livelihoods of Indigenous Peoples, traditional riverine communities, and urban populations (e.g., up to 93% of fishery production depends on migratory species). The Amazon is the largest river basin on Earth and its discharge accounts for 16 to 22 percent of all freshwater flowing into the oceans.

Maintaining the connectivity of Amazonian freshwater ecosystems preserves ecological processes, as well as biological and cultural diversity, and it is essential to climate change mitigation, adaptation, and resilience.

Free-flowing –and rivers that retain good connectivity are also crucial to the sociobioeconomy of the Amazon Basin. Species of economic importance and those essential for food security depend on river connectivity. Large migratory catfish rely on extensive river corridors to complete their life cycles, while açai productivity depends on the transport of nutrients from the Andes.

¹ This policy brief summarizes the analysis "Connectivity First: Free-Flowing Rivers for the Brazilian Amazon."

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Methodology

The prioritization focused on fifth-order rivers or higher and used the Connectivity Status Index (CSI) as the main technical criterion. The assessment also drew on data covering long-distance migratory species and Amazonian dolphins, fisheries importance, connectivity among protected areas, water types, and rarity-weighted species richness.

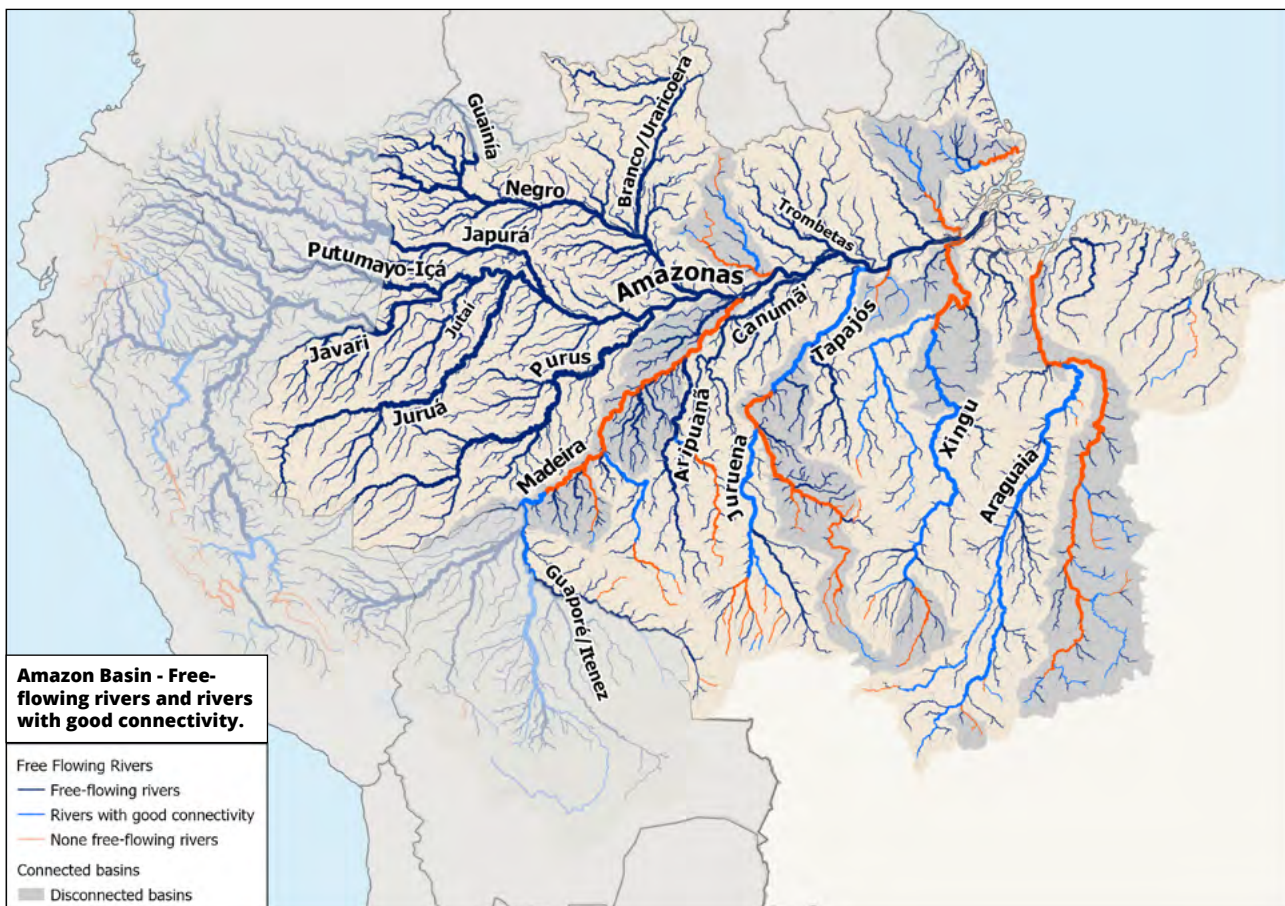
Results

After applying the evaluation criteria, 19 rivers were identified. The results distinguish two groups:

- (1) rivers that remain free-flowing; and
- (2) rivers whose free-flowing condition has been altered, but that still retain significant, well-connected reaches.

The results show that these rivers sustain fundamental ecological and socioeconomic processes at the basin scale, including:

- (1) long-distance migration of aquatic species;
- (2) transport of sediments from the Andes;
- (3) maintenance of aquatic biodiversity;
- (4) food security;
- (5) fisheries productivity; and
- (6) connectivity among protected areas.



Conclusion

The connectivity of Amazonian aquatic ecosystems constitutes a strategic ecological and territorial condition for the Brazilian Amazon. The results show that the identified rivers sustain essential ecological and socioeconomic processes.

The policy implication is clear: river connectivity must be recognized as an explicit conservation and planning objective, rather than protected only by indirect means. Protecting free-flowing rivers in the Brazilian Amazon is a structural decision—not an isolated, sector-specific measure— necessary to sustain biodiversity, fisheries, climate resilience, and food security at the basin scale.

Recommendations

1. **Establish a legal pathway to recognize free-flowing rivers**, designating them as conservation priority under Brazilian legislation.
2. **Strengthen Amazon basin-scale governance** to identify free-flowing rivers and no-go zones, and implement a monitoring system for free-flowing rivers – covering connectivity, fish populations, and sediment dynamics – coordinated among Amazonian countries.
3. **Guarantee the rights of Indigenous Peoples and traditional communities** by ensuring Free, Prior and Informed Consent for all those affected by projects that compromise river connectivity.
4. **Incorporate connectivity into planning at the appropriate scale** by adopting basin-wide Strategic Environmental Assessments before licensing new projects.
5. **Incorporate the conservation of free-flowing rivers into Brazil's national biodiversity (NBSAP) and climate (NDC) commitments.**
6. **Prevent further fragmentation from infrastructure** by designating the identified rivers as no-go zones for hydropower projects and other infrastructure that compromises connectivity, and by embedding that restriction into federal energy-planning instruments and concession, planning, and licensing processes.

Key references

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