

BONDS

Balancing biOdiversity coNservation with Development
in Amazonian wetlands



Institut de Recherche
pour le Développement

FRANCE

COMBINE CONSERVATION AND DEVELOPMENT STAKES IN
SCENARIOS OF BIODIVERSITY AND ECOSYSTEM SERVICES
FOR THE EXTENSIVE FLOODPLAINS OF THE WORLD'S LARGEST
RIVER SYSTEM: THE AMAZON



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CONTEXT

Seasonally inundated by nutrient-rich sediments from Andean headwaters, Amazonian “whitewater” river floodplains have long been centers for human settlements practicing a mixed subsistence system of cultivation, supplemented by fishing and hunting. Over the past several decades, unprecedented demographic and economic growth have challenged the traditional balance of resource use that sustains both humans and biodiversity on the floodplain and bordering upland. Threats to the integrity of Amazon floodplain habitats from dams, river navigation networks, extension of the agricultural frontier, and climate change are increasingly severe. However, to date, biodiversity scenarios for the Amazon have not considered these critical environments.



Fig.1 Schematic view of the study area

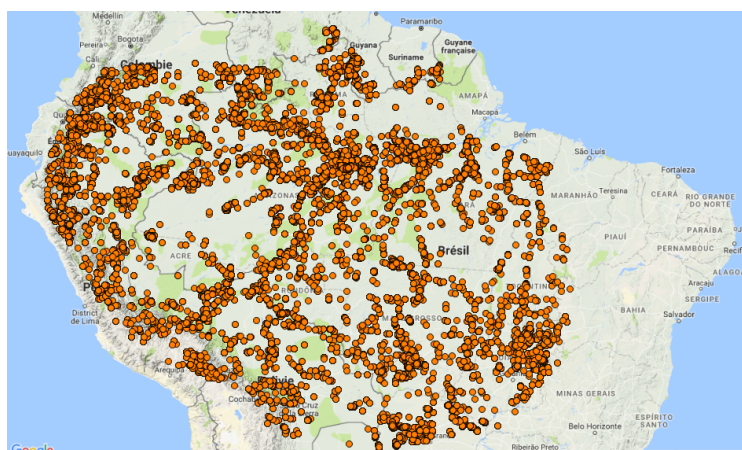


Fig.2 Fresh water fishes occurrences available on GBIF for the study area

OBJECTIVES

The overall BONDS objective is to look with stakeholders for solutions enabling preservation of biodiversity and ecosystem services in Amazon floodplain environments under a variety of development scenarios, and to provide support for decision-making at local and regional scales. To explore potential scenarios of Amazonian floodplain biodiversity and services in a rapidly changing socio-environment, we need to:

1. Improve methods for capturing spatio-temporal variability of floodplain habitats, allowing us to scale up existing biodiversity data sets and to evaluate the potential impacts of regional drivers such as climate, land use intensification, and dams upon wetlands habitats.
2. Improve knowledge on the interactions between local populations and their environment and how they may adapt to changes in regional drivers, including socio-demographic and socio-economic drivers.
3. Understand how public policies and governance have contributed to wetland habitat protection and freshwater biodiversity conservation.

This knowledge is essential to look for solutions enabling biodiversity conservation with development and to provide support for decision-making. Looking collectively for solutions will be done through the construction of exploratory and target scenarios with different types of stakeholders (e.g. local population representatives, commercial fisheries representatives) and decision-makers

APPROACH

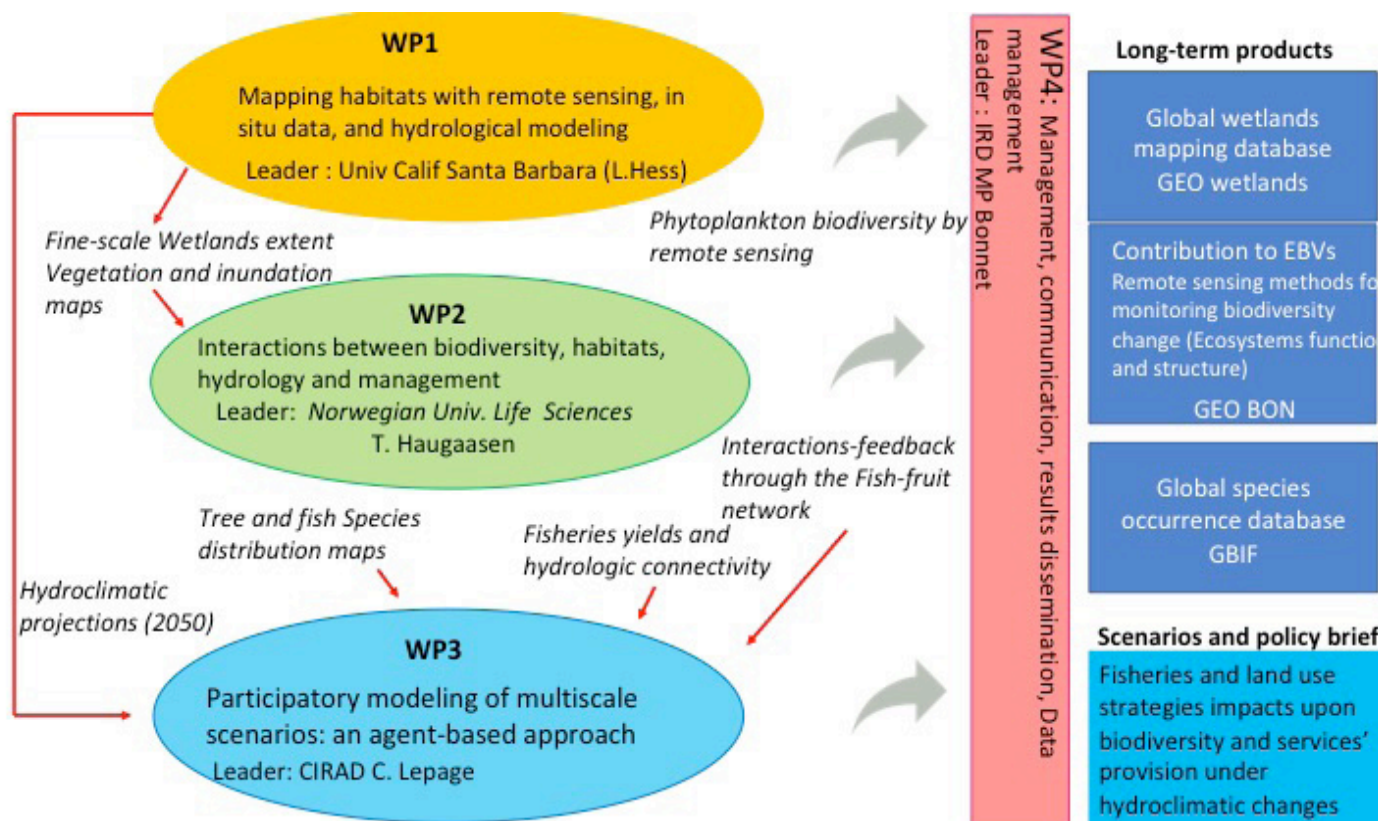
Building on decades of floodplain-focused research in the Amazon by consortium members, the proposed work will improve characterization of floodplain habitats and inundation dynamics, allowing us to:

1. Scale up existing fish, floodplain forest, and phytoplankton biodiversity data sets,
2. Evaluate the potential impacts of regional drivers such as climate, land use intensification, and dams upon wetland habitats,
3. Engage at local and regional scale a large panel of stakeholders in looking for sustainable strategies for wetlands preservation.

The scenarios produced at both scales will be compared in terms of wetlands conservation and biodiversity descriptors but also in terms of Sustainable Development Goals indicators.

The engagement of local stakeholders will benefit from long-standing relationships with community leaders, farmers' unions and fishing cooperatives, and previous transdisciplinary research work. The comparison between local sites will help in upscaling our results at the regional scale. Agent based simulation platforms **CORMAS** and **GAMA** will support the integrative and participative modeling.

BONDS integrates remote sensing, socio-economic data and modeling, as opposed to considering these elements separately.



GEOGRAPHICAL SCOPE

BONDS focuses on floodplains of «whitewater» rivers, which include the mainstem Amazon floodplain (~100,000 km²) and tributaries such as the Japurá-Caquetá, Juruá, Purus, and Madeira, covering two countries (Brazil and Colombia)

SCIENTIFIC DISCIPLINES INVOLVED

Bioinformatics; Climatology; Conservation Biology; Ecology; Fisheries Science and Technology; Forestry and forest sciences; Hydrology; Political sciences; Remote Sensing

EXPECTED RESULTS

General

Solutions found with the stakeholders to ensure biodiversity conservation and ecosystem services in Amazonian wetlands and support for decision-making processes

Specific

- **Improved habitat mapping in order to**
 - o Furnish description useful for species distribution analysis
 - o Evaluate potential impacts of changes in regional drivers (climate, socio-economics, hydroclimatic)
- Improved understanding of **population adaptation to changes** and how it can impact ecosystem services and biodiversity
- **Evaluation of public policies and governance** contribution to wetland biodiversity conservation