

# Preserving Biodiversity in the Atlantic Forest of Brazil and its Araucaria Moist Forest Ecoregion

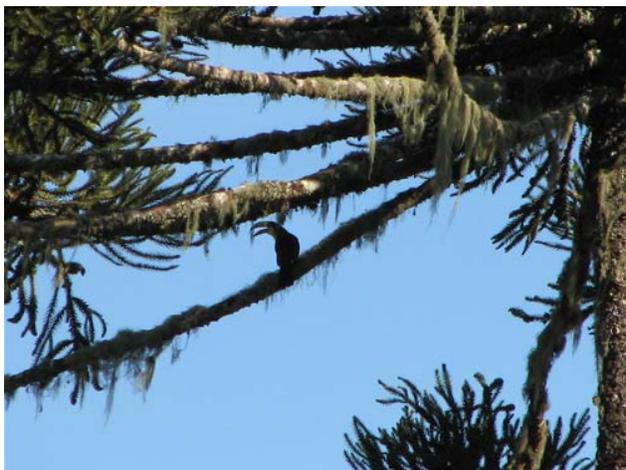
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The Brazilian Atlantic Forest ranks among the top five biodiversity hotspots in the world, yet it is also one of the rainforests most impacted by human activities. The Atlantic Forest and its related ecosystems originally covered an area corresponding to 16% of Brazilian territory. Currently, about 7% of the original forest is left intact and the majority of the remaining patches are embedded in a mosaic of secondary or anthropogenic forests, tree plantations, pastures, and agricultural crops. All sizes of forest fragments are distributed along topographically complex terrain and left isolated, with increasing pressure from urbanization, agricultural expansion, and other types of threats.

Even with only 7% of the original forest cover remaining, the Atlantic Forest harbors over 20,000 plant species, of which 8,000 are endemic, along with 850 bird species with an endemism rate higher than 22%. The majority of conservation activities in the region are focused on preserving existing forest patches. However, increasing the restoration efforts and developing larger continuum of forests may help to sustain natural habitats and their biodiversity. These efforts require detailed information on the location and size of forest fragments, their values in terms of biodiversity and ecosystem services, and the type and intensity of anthropogenic threats.

Using remote sensing and ecological niche modeling techniques, I am evaluating which factors determine the spatial patterns of biodiversity within this biome and across its different ecoregions. As part of this research, I am validating the ecological niche modeling approach in the field and measuring its accuracy in order to develop a methodology to define the best areas for forest restoration based on biodiversity connectivity and land use changes. The UCLA Department of Geography and The Nature Conservancy (TNC) - Atlantic Forest Conservation Program have signed a technical partnership agreement and TNC is committed to utilizing my research findings as a guideline for their forest restoration strategy.

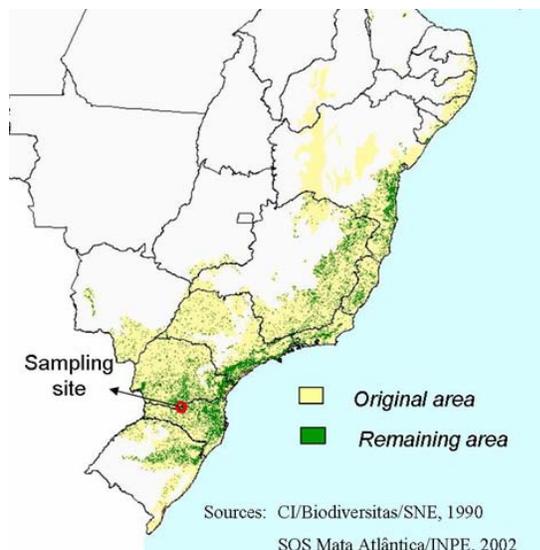
My field research is focused on ten endemic bird species in the Atlantic Forest (four contingas, two parrots, and four toucans) who serve as forest quality indicators. These frugivores (fruit eaters) play an important ecological role as seed dispersers and are usually the first group to suffer the effects of forest fragmentation. In addition to locating birds, I am also obtaining occurrence data (point localities) for trees, such as the *Araucaria angustifolia*, whose economic value makes the fragments where they occur targets for deforestation. Studies involving these trees may help to track fragments at risk of being logged illegally.



Red-breasted toucan (*Ramphastos dicolorus*), one of the target species, sitting on an *Araucaria* tree.



Brazilian "pine" tree (*Araucaria angustifolia*).



Original and remaining areas of the Atlantic Forest of Brazil.

During the summer of 2007, I traveled to Brazil for a two-month field season. I spent most of my time collecting occurrence data for birds and trees in the first TNC reserve located in the Araucaria Moist Forest, one of the most threatened ecoregions of the Atlantic Forest (with less than 5% of its original vegetation). The Brazilian "pine" tree (*Araucaria angustifolia*), which is predominant in this region, is a critically endangered species (on The World Conservation Union - IUCN 2007 Red List) due to its overexploitation. Although its logging has been banned in Brazil, illegal logging continues. This slow-growth pine is considered a keystone species for this ecoregion, and I am hoping that my research findings will contribute to its conservation.

During future field seasons, I will be collecting data in other Atlantic Forest ecoregions to analyze and compare the model's response in relation to differences in biodiversity spatial patterns, land use, and anthropogenic pressures.



Ana Paula Giorgi and TNC park ranger Waldemar Levandovski setting up a transect to collect tree data. 10 m x 40 m transects were placed every 200 m throughout the 2 km main transect. Bird data were collected in the middle point of each tree transect.



The Araucaria Moist Forest. This entire ecoregion is fragmented by roads, farms, industries, and other types of land use.

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