

# RGS-IBG Field Research Programmes

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Geographical  
Society  
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Advancing geography  
and geographical learning

- Maracá Rainforest Project
- Brazil
- 1987-1988

**An ecological survey of the riverine island of Maracá, an important tropical forest reserve in Brazilian Amazonia, and four related programmes: forest regeneration; soils and hydrology; medical entomology; land development.**

At the invitation of the Brazilian Secretariat of the Environment, SEMA (Secretaria Especial do Meio Ambiente) and in association with the National Amazonian Research Institute, INPA (Instituto Nacional de Pesquisas da Amazônia)

*Patron:* HRH The Prince of Wales

*Leader:* Dr John Hemming, Director and Secretary, Royal Geographical Society;

*Field Leader:* Steve Bowles; *Administrator:* Fiona Watson.

#### *Scientific Programme Directors:*

*Ecological Survey:* Dr James Ratter, Chief Principal Scientific Officer, Royal Botanic Garden, Edinburgh; Brazilian counterpart, Dr Ângelo ds Santos, INPA Ecologia

*Forest Regeneration:* Dr John Proctor, Department of Biological Science, University of Stirling; Brazilian counterpart, Dr João Ferraz, INPA Silvicultura.

*Soils and Hydrology:* Professor John Thornes, Department of Geography, University of Bristol; Brazilian counterpart, Flávio Luizão, INPA Ecologia.

*Medical Entomology:* Dr Victor Py-Daniel, INPA Entomologia.

*Land Development:* Dr Peter Furley, Department of Geography, University of Edinburgh

Number of members: 202

Duration: February 1987 - March 1988 and follow-up monitoring in 1989 and 1990

At the invitation of the Brazilian Environment Secretariat (SEMA) and in collaboration with the National Amazon Research Institute (INPA), the RGS mounted the largest British project ever to work in Brazilian Amazonia. It was a welcome invitation, since, although Brazil contains almost 60 per cent of the world's surviving rainforests, it is difficult for foreign scientists to obtain permission to work there.

SEMA requested an ecological survey of the flora, fauna and physical geography of its Maracá Ecological Reserve, in the northernmost Territory

of Roraima. Maracá is a vast 100,000-hectare uninhabited island, 60 kilometres long and 25 kilometres wide, on the Uraricoera river, a tributary of the Amazon. Its forests, wetlands, patches of savanna, and small hills are largely unexplored. SEMA has a purpose-built research station on the eastern tip which served as a comfortable base for the project.

The Maracá Rainforest Project's research proposals were welcomed by Brazilian authorities as being of real practical benefit to their country. For the Ecological Survey, 89 scientists and 41



technicians, the majority of whom were Brazilian, recorded, studied and in some cases collected Maracá's rich fauna and flora. Botanical teams from Kew, Edinburgh, INPA, Paraiba and other Brazilian institutions collected and identified 2,800 "numbers" of plants and inventoried, tagged and measured over 9,000 trees. Wherever possible eight replicates were collected of each number for distribution to appropriate herbaria in Brazil, UK and USA. Ornithologists observed a remarkable total of 450 species; entomologists collected over 30,000 of specimens of a wide range of insects from ants and termites to moths, butterflies, bees and flies and some new species were discovered. Maracá is very rich in bats with 46 species recorded; studies were made of monkeys, small mammals, otters and other animals. Aquatic studies included work on fish, zooplankton, molluscs and sponges. Geological, soil and meteorological data was gathered to complete the survey.

The Forest Regeneration Programme is a long-term study investigating ways in which rainforest could grow after destruction. Artificial gaps were created and the sequence and rate of seedling growth, rate of litterfall, decomposition, changes in soil composition and effects of clearance on water and nutrient cycles were tested. This team also studied the reasons for the abrupt natural boundary between forest and savanna by examining changes in soil chemistry, water table, soil micro-organisms and vegetation across the boundary.

The Soils and Hydrology team devised a set of experiments looking at changes in soil chemistry, erosion and rainwater runoff after different types of forest clearance. It showed the importance of the root-and-litter mat in checking erosion, and made other important discoveries that will help rainforest conservation.

In a series of long river journeys, the medical entomologists studied insects which transmit some of the major diseases of Amazonia such as the Simuliidae blackfly vector of onchocerciasis, Anopheles mosquitoes which carry malaria and

sandflies which transmit leishmaniasis. This team's work will help to control some of the region's worst diseases.

The Land Development programme was based off Maracá island, where there is active colonisation of nearby forests and savannas. Settlers were interviewed and soils and vegetation of their deforested land were analysed. Rates of deforestation were assessed using Landsat satellite imagery and studies of farming methods, horticulture and history of frontier settlement in Roraima were carried out.

Data from this programme will go to Brazilian government agencies concerned with colonisation in order to help the settlers and minimise the environmental damage they cause by lessening their rate of failure.

Much research was carried out in the interior of Maracá island and this involved numerous tough river trips up formidable rapids, mapping the myriad channels and waterfalls, cutting many new trails through the dense vegetation and often steep terrain, and establishing sub-camps.

It was a fundamental objective of this Project to involve as many Brazilian scientists as possible (over 130 participated) and to present the results in Portuguese at a major review conference in Manaus in April 1989 and in Brazilian journals. This policy increased the chances of the Project's findings being applied to save Amazon forests.

**Major sponsors included:**

The Ford Foundation, The Overseas Development Administration, The Sainsburys' Headley Trust, The Baring Foundation, The Dulverton Trust, ICI Brazil, Souza Cruz (BAT), Lloyds Bank International, European Brazilian Bank, Linhas Correntes (Coats Paton), The Royal Botanic Gardens, Kew and Edinburgh, The Royal Society, The British Academy, Mercedes-Benz do Brasil, Petrobras, Mercury outboard motors and Philip Harris laboratory equipment.



**Further reading:**

Milliken, William, & Ratter, James A. eds. (1998)

**Maracá: The Biodiversity and Environment of an Amazonian Rainforest**, John Wiley & Sons

Ltd, London, 492 pages, maps, diagrams..

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