

## DEMARICATION AND SIGNALLING OF ENVIRONMENTAL CONSERVATION UNITS IN AMAZONIA

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The BR-319, the highway that connects the city of Porto Velho-RO to Manaus-AM, is the only land link between the main cities located in the north of the Amazon River and the rest of the country. Currently, this road does not have traffic conditions and its revival constitutes a strategic integration of the Brazilian territory, facilitating and cheapening the traffic of people and goods, and lessening the time needed to transport.

The environmental agencies show a huge resentment towards the revitalization of the highway as facilitate the traffic of people in an area of primary forest mostly untouched. To make the project possible and minimize the environmental impacts, the federal government ordered the creation of 24 Environmental Conservation Units over the 832 km highway, allowing the preservation of more than 117,000 km<sup>2</sup> in the Amazon forest.

This paper aims to describe the planning and the methodology, which are employed to carry out the demarcation and signalling of about 13,400 km along the perimeter of the 24 Units created in the area of influence of BR-319.

In order to do that, Geographic Service of Brazilian Army is employing about 10 cartographic engineers, 60 topographers in office and fieldwork and 100 office assistants in various functions, beyond a substantial amount of technical and logistics materials, installing operational fixed (terrestrial) and mobile (floating in the main rivers of the region) bases, so that, in a period less than two years, it will be installed, approximately: 1,000 marks, with accuracy of 0.5 m; 3,500 river and terrestrial signs, and 200 road signs along highways .

The determination of the quantity and the location of each mark and signs was the result of a methodology developed together with environmental agencies considering the existence of indigenous people and the desired degree of conservation for each Conservation Unit created.

In addition, it was necessary to develop a new mark model, better suited to the region and to this type of operation. Lighter materials have been researched and applied. They are more resistant to intense humidity of the region, and its new format allows better fixation to the soil.

The large variation in the level of the rivers in the Amazon region (which may exceed 20 meters between the period of flood and ebb in the main rivers) forced the project managers to modify the material normally used in the manufacture of signs. The new signs are set on the trees in order to be not submerged in the flood season.

The quantity and composition of each work team had to be sized according to the material to be used, to the type of operation, to the length of each launch, and to the availability of local labor for support in each area of operation. The results in implementing the marks and signs are being achieved, despite the difficulties encountered, such as extra muddy soils, malaria, possibility of attack from wild animals and others.