

Title: Relevance Criteria for the classification of caves in Brazil

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ABSTRACT

What is the scientific basis used for the classification of caves in Brazil? Are the attributes identified today and the aspects evaluated sufficient to classify natural underground cavities? To answer these questions, 1,169 caves were selected as a sample of the universe of 6,522 natural underground cavities known and registered in Brazil. A questionnaire was developed to assess the major attributes of importance for each cave (ecology, environment, scenic beauty, scientific interest, historic-cultural value, or socio-economic value) and identify the perceived relevance (6 levels) of 16 aspects specified by the existing environmental legislation: size; morphology; scenic value; geological, geomorphological and mineralogical peculiarities, archaeological and paleontological remains, hydric resources, fragility of ecosystem, presence of species which are endemic, rare or threatened by extinction, biological diversity, historic-cultural value, and socio-economic value. Scope of importance of the cavities (on a local, regional, national, or international scale) was also evaluated. The questionnaire was distributed to 11 specialists, professionals with a wide experience and knowledge in the area of speleology, and they were asked to evaluate each cave in relation to each of these aspects. The results of these questionnaires were analyzed using the statistical tools of Multivariate Analysis. Cross-tabulated frequency tables were established locating all caves in relation to location (unit of Conservation), biome, typology, podology and lithology. Discriminate analyses for both the caves as such and for the caves located in municipalities where the extraction of limestone and dolomite is practiced led to the identification of pertinent descriptive attributes, and these were compared to what was identified by the experts. Although the classification in relation to attributes of importance was only 62.1% effective, this level was raised to 95% by the use of confirmatory discriminate analysis. The result was a new and more effective proposal for the classification of the caves in Brazil.