Matriz de Atributos de los Mamíferos Registrados en la Cuenca Alta del río Cuyuní, Estado Bolívar, Venezuela

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Report at a Glance

RAPID BIODIVERSITY ASSESSMENT OF THE AQUATIC ECOSYSTEMS OF THE UPPER CUYUNÍ RIVER BASIN, VENEZUELAN GUAYANA

Expedition Dates

January 18 – 31, 2008

Area Description

The area studied during this RAP survey is located in the Upper Cuyuní River Basin and its tributary, the Uey River within the Esequibo river system, in the Bolívar State in the Bolivarian Republic of Venezuela. Due to the hydrographic network of the Cuyuní and Uey rivers, the area surveyed was divided into five focal areas: Focal Area 1 – Lower Uey River, from the confluence of the Cuyuní and Uey rivers (06° 06'11,5" N – 61° 30'34,3" W), to a stream located upstream from the Uey River (Stream 2, tributary of the Las Malocas Stream, 06° 04'12" N – 61° 28'08,8" W), at an average elevation of 123 m a.s.l.; Focal Area 2 – Upper Cuyuní River, sector between the confluence of the Cuyuní and Uey rivers and a tributary stream off the left bank of the Junín River (06° 05'44" N – 61° 33'20" W), 120 m a.s.l.; Focal Area 3 – Lower Cuyuní River, located between the confluence of the Cuyuní and Uey rivers and principal channel of the Cuyuní River located after its confluence with the Amarilla Stream (06° 11'21" N – 61° 30'21" W, 115 m s.n.m.); Focal Area 4 – Upper Uey River, located at the headwaters of the Uey River in the Sierra de Lema, including a small section of the waterfalls of the Uey River (05° 57' 29,8" N – 61° 30' 15,2" W) at an elevation of 586 m a.s.l., until the principal channel of the Uey above the waterfalls (06° 57' 16,2" N – 61° 30' 13,6" W) at 600 m a.s.l; and Focal Area 5 – Middle Uey River, in the foothills of the Uey River and the spurs of the Sierra de Lema at 06° 02' 23,5" N – 61° 30' 26,4" at an elevation of 135 m a.s.l. until the principal channel of the upper waters of the Uey River (subsidiary branch) (06° 01' 59,6" N – 61° 30' 49,6" W, 170 m a.s.l.).

Reasons and Objectives for the Expedition

The fundamental reason for undertaking this RAP survey is the need to improve our understanding of the biological diversity of this region and its conservation state, given that it is one of the areas within the Venezuelan part of the Guayana Shield that is both historically and currently most threatened by human activities. This information will provide a baseline of data to guide sustainable conservation and development actions for the Upper Cuyuní River, an area of great biological, geographical, political, hydrological, and economical importance. The specific objectives of this study included: 1) inventory the species of mammals, birds, reptiles, amphibians, fishes, crustaceans, mollusks, and other aquatic invertebrates (especially insects); 2) describe the vegetation types present in the study area; 3) create a list of the flora of the riverine forests; 4) study the geochemistry of the water and test for mercury contamination in the basin (samples were taken from sediment, water, aquatic invertebrates, and fishes); 5) to report on the presence of endemic and restricted range species in the area of study; 6) recognize important species for conservation (endangered, threatened, etc.) and of sustainable use for humans; 7) identify

habitats and areas of special interest (high diversity, high density of endemic species, etc.) present in the area of study; and 8) identify the current and potential threats to the area and offer recommendations for the conservation of the local biodiversity.

PRINCIPAL RESULTS OF THE RAP SURVEY

Number of species

Plants: 517 species collected during the RAP survey
Aquatic Macroinvertebrates: 82 species
Fishes: 125 species
Amphibians: 29 species
Reptiles: 24 species
Birds: 254 species
Mammals: 87 species

New records for Bolivar State

Plants: extension of the known geographic or ecological distrubution of *Nautilocalyx porphirotrichus, Tachia schomburgkiana, Phragmipedium klotzschianum, Sobralia stenophylla* y *Archytaea triflora*, all known from tepuyes habitat at middle elevation in the Sierra de Lema or in the Caroní River Basin
Fishes: 9 species for the Cuyuní River Basin
Reptiles: 1 species
Birds: extension of the distribution of 11 species

New records for Venezuela and interesting notes

Fishes: 6 species
Aquatic Macroinvertebrates: 4 species- the ephemeropteran (mayfly) *Leentvaaria palpalis,* the belastomatid beetle *Weberiella romboides,* the gomfid *Ebegomphus conchinus* and the isopod *Parischioscia omissa*

Species New to Science

Fishes: likely 6 species

RECOMMENDATIONS FOR CONSERVATION

The Cuyuní River Basin has been subject to artisanal gold mining (small scale mining) since the end of the last century, as well as to timber extraction. Despite this, the upper part of the basin – especially that of the Uey River in the foothills of the Serranía de Lema – remain in almost pristine or only slightly altered condition. Based on the results from this RAP survey, as well as other general observations of the area, we propose the following recommendations for the conservation of the biodiversity and ecosystems of the area:

- Quantify the extent of the forests and lands that have been modified and determine plan for restoration, as well as undertake comparative studies of the biodiversity of the pristine areas with the areas altered by humans.
- Establish a protected area in the middle and upper part of the Uey River Basin, through a collaborative strategy involving governmental and non-governmental institutions, local miners, and Gold Reserve de Venezuela C. A. – Compañía Aurífera Brisas del Cuyuní C. A.
- Continue to analyze the mercury contamination in the water, sediments, invertebrates, fishes and humans on a temporal (hydrological cycle) and spatial scales (entire basin).
- We recommend the immediate application of means to prevent the increase in artisanal mining in the area. This must be accompanied by a program to reduce the emissions of mercury through education and training the miners in the use of "retortas", which are widely distributed among those who work with the burning of amalgams. This can have a significant effect on reducing the level of mercury in the Cuyuní River Basin, since recovery of this metal is over 98% when the "retorta" is used. In addition, not only efficiency but also the quality of the gold has been found to be enhanced by miners in other areas who use the "retorta".
- Raise awareness among the local communities, principally the miners, of the risks of ingesting fishes, especially the carnivores that are in most frequently caught and eaten (e.g. aimara, payaras, curvinatas, etc.) and substitute these with smaller species that are herbivores, omnivores or detritivores. It is especially important that pregnant women do not eat these carnivorous fishes, since the high mercury levels in these fishes can seriously affect the development of the fetus.
- Evaluate in a detailed manner the impact of mining activities on the fish communities and aquatic insects in the streams, by sampling over a wider geographic area and sample streams that are currently and have in the past been impacted by mining, as well as streams in pristine condition.
- Support and provide incentives for the development of programs aimed at sustainable use of the resources of the zone, which enhances the quality of life of the local human communities as well as biodiversity.
- Develop a protocol for a long term biodiversity monitoring program in the Upper Cuyuní River Basin, including key plant and animal species (endemics, threatened species, human use, etc.) that can be part of sustainable development projects.
- Establish a biological station on the Uey River and develop courses for training of parabiologists or local environmental monitors, including the miners.

- Complement the results of the RAP survey with additional surveys in the dry season to obtain a more complete picture of the diversity of aquatic invertebrates, fishes, reptiles, mammals and birds; and in the rainy season for amphibians, birds and mammals.

- Given that the sub-basin of the Uey River remains in a state least altered by humans within the Cuyuní River Basin, and also has high biodiversity importance- high diversity and endemism- we recommend that a biological and monitoring station be established there which will promote the area as a protected zone and buffer between Canaima National Park and mining activities.