

## BIOSS Team Surveys Mahale Mountains National Park

by *Bakari Mnaya*

The LTBP BIOS S teams from Burundi, D. R. Congo, Tanzania, and Zambia united together for a special underwater biodiversity survey at Mahale Mountains National Park from 23rd March to 07th April 1999. This Park was officially gazetted in 1980, and it is situated 120 km south of Kigoma, Tanzania. It lies on a peninsula that extends into the lake and covers an area of 1613 km<sup>2</sup>. To the West, the Park extends its boundary into the Lake, protecting the adjacent 1.6 km wide strip of coastal waters of Lake Tanganyika. The terrain of the Park is mostly rugged and hilly, dominated by the Mahale Mountain chain running roughly north-west to south-east across the middle of the Park. Owing to its remote location, the park normally receives less than 300 tourists per year.

### *Vegetation of the Park*

Mahale Mountains National Park is one of the few places in the Tanganyika basin where one can see original primary forest. About three quarters of the Park is covered by Miombo woodland, mainly the *Brachystegia*, *Isoberlinia* and *Julbernardia* species. The mountain range imposes its effects on the types of vegetation present and their distribution. Rainfall data indicate that the Western slopes of the mountain get more rain than elsewhere; Kanyana, in the West receives 1870 mm per year compared to Bilenge in the North which receives only 1400 mm of rainfall. This accounts for why the western vegetation is composed of lowland forest while that in the North is miombo woodland. Where the mountain chain converges with the lake, there is a broad blanket of lowland forest up to about 1300 m. Above 1800 m, there is a mixture of bamboo bushland and montane forest including trees such as *Podocarpus*, *Bersana*, *Macaranga* and *Croton megalocarpus* which live in similar forests on Kilimanjaro and Meru mountains, and Ngorongoro Conservation Area. Above 2300 m, the forest gives way to montane grassland.

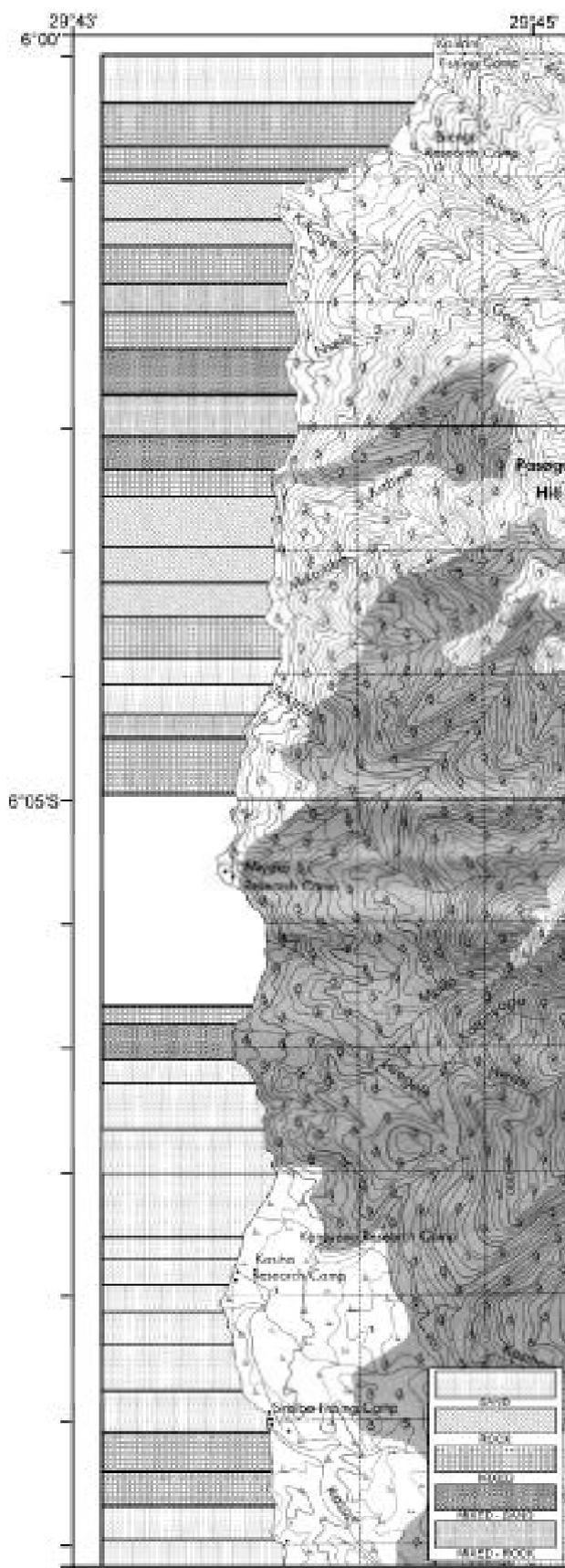
### *Mammals of the Park's Terrestrial Habitats*

Due to its great size and variety of habitats, the park hosts many different mammal species. In the eastern woodlands of the Park, mammals like elephants, warthogs, giraffes, zebras, roan antelopes, and buffaloes can be found along with their predators including lions, spotted hyenas, and wild dogs. In the lowland forests, bushbucks and some mammals more typical of West Africa can be found (e.g. Brush-tailed Porcupine and Giant Forest Squirrel). Chimpanzees and other primates are also found in the Park.

### *The Bioss Survey At Mahale Mountains National Park*

As a general rule of conservation biology, before setting your goals on conserving or managing any kind of natural resource, one should know in detail what the resource consists of in both biotic and abiotic forms. The LTBP aquatic survey of the Mahale Coastline will assist Tanzanian National Park Authorities (TANAPA) to understand and make informed decisions regarding conservation and management strategies for the aquatic sector of the park.

On arrival at Mahale, the Park Warden In-Charge, Mr. Mbaga, gave a welcome speech to the team members. The survey began

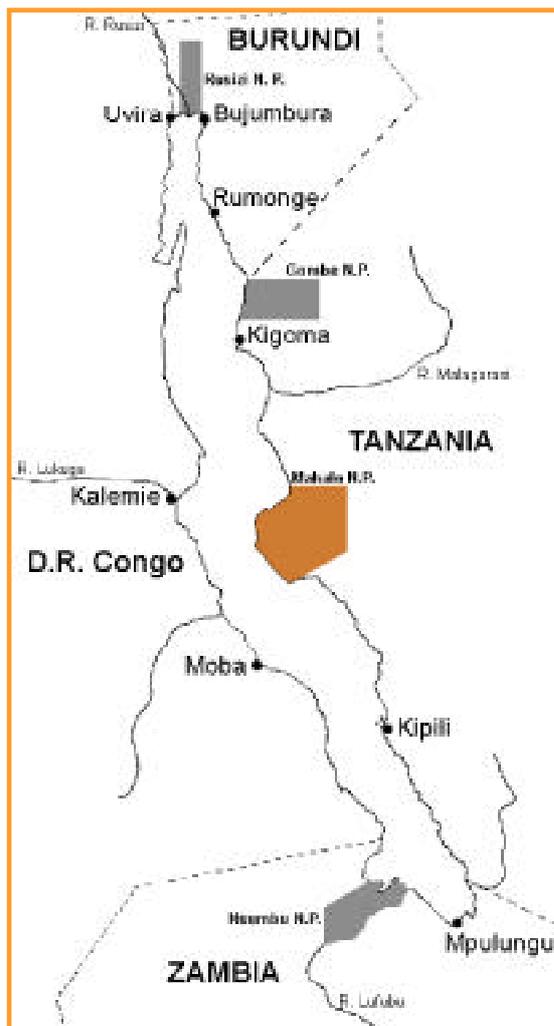


Distribution of habitats in the northern portion of Mahale N. P. determined from 'Manta board' surveys.

with team members doing manta surveys along the 60 kilometres of park coastline. This provided a description of the lake's substrate characteristics, e.g. inclination, percentage composition of sand, gravel, rocks, boulders and bed rock; coast line characteristics. Based on the distribution of habitats established through the manta survey, the team established which sites would be surveyed in detail. Though the initial plan was to survey 30 sites, due to weather, illnesses, and other complications, the team was only able to thoroughly survey 27 sites, which is 90%; and still a great success.

The surveys were divided into four components: habitat profile, mollusc census, and two different methods to census fishes.

The regional group divided into 3 different teams which each worked a different site each day. At each site, the first pair of divers conducted the habitat profile, descending to 25 m depth and recording the characteristics of the substratum (e.g., percentage of rocks and sand and their characteristics) and fauna at 10 m intervals along an 80 m transect. This was done using a marked reel which remained underwater throughout the other surveys.



Location of Mahale N. P. (orange) on Lake Tanganyika (modified from sketch by Coulter and Lowe-McConnell, November 1995).



Richard Paley (BIOSS Facilitator) and Reuben Shapola (Dept. of Fisheries, Mpulungu, Zambia) discuss survey preparations.

The second pair of divers conducted the mollusc survey, following the transect line set by the previous team. The divers worked at 25 m, 15 m, 5 m and snorkelled at 0-2 m. At each depth, divers tried to note all the gastropod and bivalve species present. Search times and techniques varied depending on the nature of the substrate. On rocky substrates, both divers searched on, under, in and among rocks for gastropods and bivalves. On mixed or sandy substrates, one diver used a sieve to collect micromolluscs from the sediment while the other followed a wider search pattern for larger molluscs. Representatives of each species were brought to the surface for definitive identifications.

Three different methods were used to survey fishes, the Stationery Visual Census (SVC), Rapid Visual Census (RVC) and Gill-netting. In the SVC, a pair of divers descended to 15 m and remained there for 15 minutes recording all the fish species they encountered. The divers then repeated the same technique at 10 m and 5 m depths. In the RVC, a pair of divers descended to 15 m depth and swam parallel to the shore for 15 minutes, recording each species of fish they encountered at 3 minute intervals (species were recorded only once). The technique was repeated at 10 m, 5 m and 0-2 m depths, the latter using snorkel technique. Finally, gill nets were set every day at the end of the diving activities and recollected the following morning. At this point, species were identified and the number of each species present was recorded. Gill-netting offered a glimpse of the nocturnal fish fauna, and was a great teaching tool for all who were not familiar with various species of fish.

The regional BIOSS teams are currently analysing the survey data and compiling a report of the Mahale Mountains National Park Survey. This report will be of great interest to TANAPA and other conservationists, for it will provide a baseline study of the Park's aquatic fauna and hence provide data for decision-makers on the proper ways of conservation and management.

The regional BIOSS teams would like to express their heartfelt and sincere gratitude to the Director General Mr. G. Bigurube and the Chief Ecologist Mr. E. Gereta, of TANAPA, for their permission to conduct this survey and also the Mahale Mountains National Park Management for all their efforts to provide a comfortable stay for all the team members.

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