AMPHIBIAN DIVERSITY SURVEY AND CONSERVATION ASSESSMENT IN THE LAKE TUMBA WETLAND LANDSCAPE OF THE CONGO BASIN, EQUATEUR PROVINCE, DEMOCRATIC REPUBLIC OF CONGO

CHIFUNDERA KUSAMBA Zacharie
Laboratory of Herpetology, Department of Biology
CRSN/Lwiro, DR Congo

INTRODUCTION

- Publications on Amphibians from DR Congo show that Amphibians form an important component of the biological diversity

- Only few studies were done in the Congo Basin

- No study on the amphibian diversity in the Lake Tumba Wetland Landscape (RAMSAR wetland)

- Surveys are needed to improve the knowledge of the amphibian diversity in the Congo Basin.

Lawson, D.P. & M.W. Klemens (2001): *Herpetofauna of the African Rain Forest: Overview and Recommendations for Conservation*. – pp. 292-310 in Weber, W., L.J. White, A. Vedder & L. Naughton-Treves (eds.): *African Rain Forest Ecology and Conservation*: Yale University Press.

BACKGROUND

1) first step: writing a pre-proposal

2) second step: study visit to the RMCA for:

-Refreshing course in collections management

-Study visit to the museum collections

-Documenting the amphibians by Intranet, and literature.

3) third step: full proposal for surveying the amphibian diversity in the Lake Tumba Wetland Landscape.

JUSTIFICATION

Why studying amphibians in the Congo Basin?

- Amphibians are important components of the biological diversity in tropical areas
- Amphibians play a role as bioindicators of the environment quality [global decline: more sensitive to change in moisture]
- The Congo Basin is among the least studied areas in the world, at least for Amphibians
- Capacities for studying amphibians are available at national and international levels

LEVEL OF EXPLORATIONS

- the RMCA registers 128,326 adult specimens from Congo R.D. representing 200 species
- Eastern regions (Ituri, Kivu, Tanganika): 72.5%
- Southern regions (Bas Congo, Lukaya, Kwango, Kasai, Katanga): 20.7%
- Central regions (Equateur (*), Mai Ndombe, Tshopo): 6.5%
- Northern regions (Ubangi, Uele): 0.3%.

(*) includes the Lake Tumba Wetland landscape (the target study area of the project).

Level of explorations

- Central
- Eastern
- Northern
- Southern
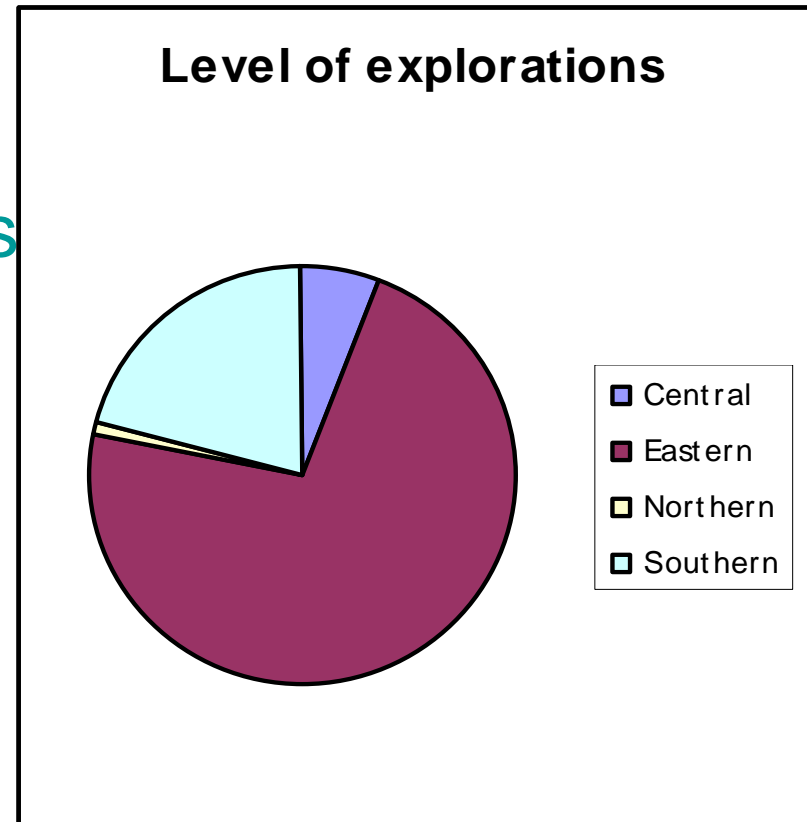
THE RESEARCH GOAL

- Improve the knowledge of the Congo Basin's amphibian fauna by:

- documenting the taxonomical variability (in space) and change (in time)

- with a geographical limitation to: the Lake Tumba Wetland Landscape

THE STUDY SITE

Lake Tumba Wetland
Landscape
(18°00' E -0°37'S,
~ 430m alt.)
encompassing:
(1) Lake Tumba
(2300 km²)
(2) Surrounding
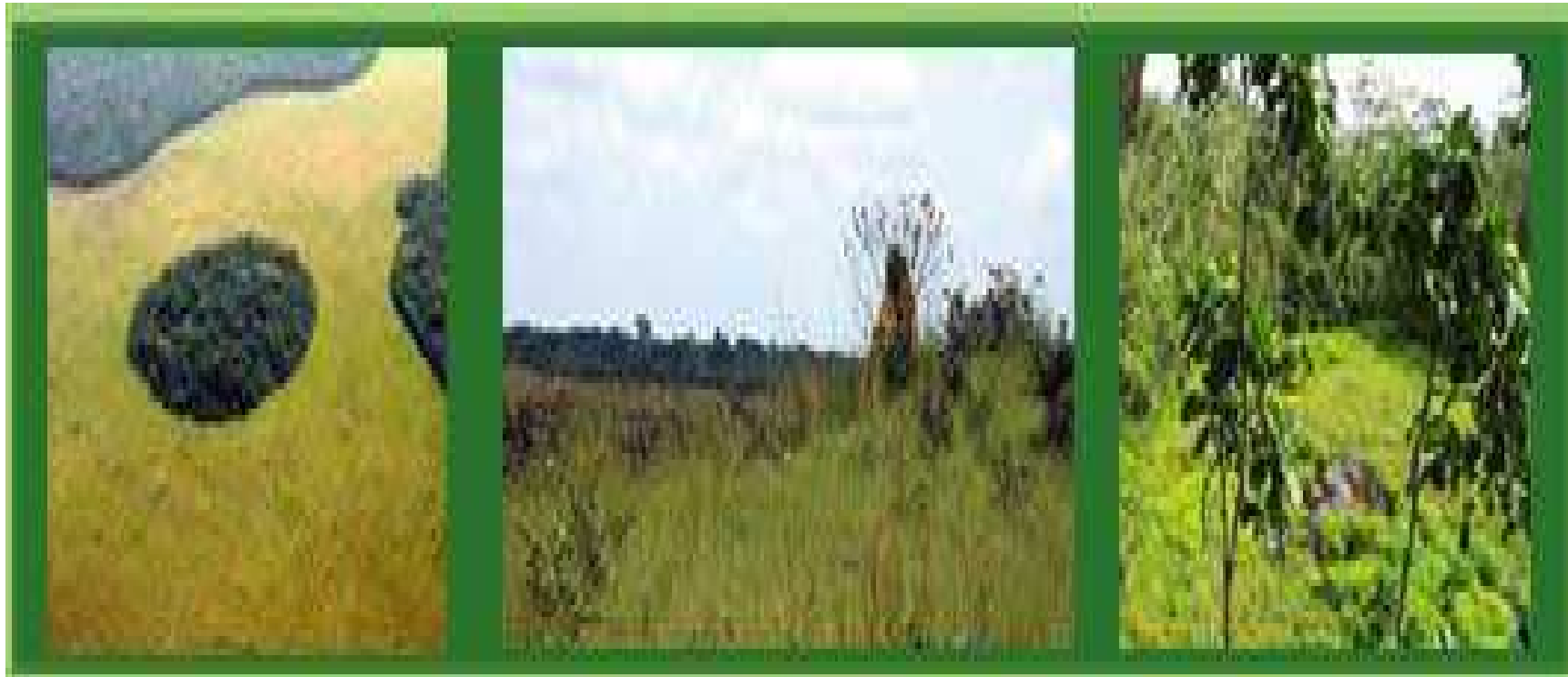Tropical Rainforest
(3) Esobe,
savannah-like habitat
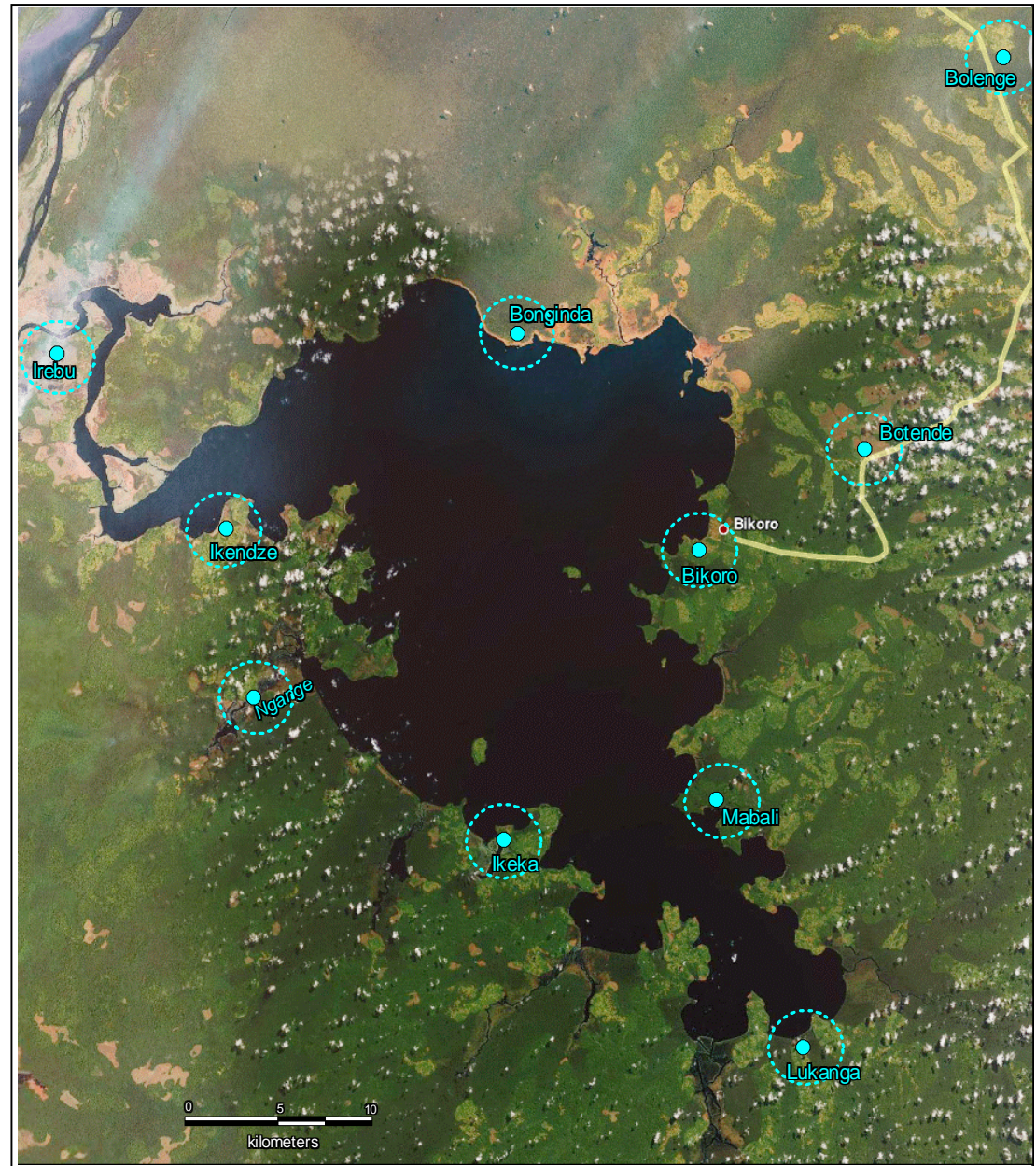
Habitats: lake, rivers, forest and wet area

Esobe lands

Savannah, Dry savannah (Esobe), water inundated lands (Libeke)

OBJECTIVES

Overall objective: improve the knowledge of amphibian diversity in the Congo Basin.

>>> Specific objectives

- establish the amphibian faunal list at Lake Tumba Wetland Landscape

- collect specimens for taxonomic study allowing the identification of taxa and description of new taxa

- collect data on amphibian biology and ecology necessary to suggest appropriate conservation measures to decision-makers.

MATERIAL AND METHODS

Material: permits, logistics, and research equipment

Methodology

- specimen collecting (field)

- habitat data collecting (field)

- specimen processing (field-laboratory)

- specimen data collecting (laboratory)

- specimen determination (laboratory)

- analysis (laboratory)

Methodology: specimen collecting

1) Site scanning method: Opportunistic surveys on different stations of the three important habitats: the lake's shores, the surrounding forest and the Esobe lands.

- Day work: visually locating individuals in all possible places and caught by hand

- Night work: acoustically detecting and locating individuals with a head lamp and laser pointer. After recording the calls the specimen recorded must be caught.

Methodology: specimen collecting

1) Site scanning method: Opportunistic surveys on different stations of the three important habitats: the lake's shores, the surrounding forest and the Esobe lands.

2) Linear transects: placed perpendicularly to habitats border and marked at 100m intervals. Each transect point will be the basis of a thorough search for specimens.

Methodology: specimen processing

- specimens are kept alive in numbered plastic bags
- Field data: date, time, site, locality (GPS), and position in habitat, weather conditions: T°, rH.
- Documenting coloration (digital camera)
- Smoothly killed by Orajel
- Photographed once again (in standard positions), weighed, and tagged with a field number.
- DNA sample: dissection of tissue from liver or thigh; placed into a labelled plastic vial in 95% ethanol
- fixation in buffered 10% formalin and transfer into 70% ethanol for permanent storage.

Methodology: specimen data collecting

a) Morphology of specimen

- Measurements: length of head, body and limbs, eye dimensions

- Description: coloration, tubercles, skin folds, granulations, webbing, tympanum, pupil form, sex, age…

b) Study of calls

- selecting sounds for analysis

- audiographic characteristics: number of calls, duration etc.

c) Study of digital photographs

- pattern description

Methodology: specimen determination

Taxonomic data analysis

- Attribution of specimens to (unnamed) taxon groups

- Giving species names by using determination keys or expertise from specialists

- Using additional information from DNA analysis for the identification of species

Methodology: habitat data

- Vegetation type, height and canopy coverage.

- Uniformity and habitat size

- Type, intensity of and distance to anthropogenic activities: cultivation, tree cutting, settlement, logging, roads, fishing, and pollution

EXPECTED RESULTS

- Amphibian faunal list(s) for the Lake Tumba Wetland landscape
- Good museum collection specimens for further taxonomic study
- Determination keys for species involved
- Comparison of species composition by habitat
- Data on amphibian biology and ecology
- (evaluation of the impact of human activities on species)
- (bottleneck analysis [for decision-makers]: in order to define appropriate conservation measures)

TIES TO BIODIVERSITY AND ENVIRONMENTAL ISSUES.

- Amphibian species richness of the Lake Tumba Wetland Landscape
- Amphibian are bioindicators of the environment requirements
- Capacity building for appropriate measures for protecting the site and its biodiversity.

CAPACITY BUILDING AND INTERNATIONAL COLLABORATION

- Training opportunities for Congolese biologists: on the field, at the RMCA and at the Centre Antivenimeux (CAV) of Kinshasa.
- Boostering ongoing conservation efforts in the region
- Collaboration with scientists from: RMCA, UTEP and McMU

LINKS TO DECISION AND POLICY MAKERS

- Local level: local communities and CBOs
- National level: Institut Congolais pour la Conservation de la Nature, (ICCN) and the Ministry of Environment, Conservation of Nature and Tourism

BUDGET ESTIMATES

Covering all expenses: material, subsistence, per diem, permits, training, travels, etc.

- Starting budget requested from UNESCO (Phase 1, one station one team): US$5500
- Phases 2,3,4 (three years full project): US$ 102500.

THANK YOU

Hyperolius sp.