

# AArk Taxon Management Plan

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## BACKGROUND

### Species (common/scientific names):

Lake Oku Clawed Frog (*Xenopus longipes*)

### Range:

North West Cameroon/Lake Oku/Mount Oku

### Distribution:

Only found in volcanic Lake Oku at 2400m

### Ecosystem:

Crater lake surrounded by forest

### Habitat

Observed around lake shore, assumed to extend into lake, which has a maximum depth of 52 m.

### Micro-habitat

Usually observed inshore over mud/sand, typically during night. Appears to retreat under debris and to deeper (> 1 m) water among aquatic plants during the day.

### Conservation status (IUCN, CITES other):

Red List Category: Critically Endangered (CR)  
Red List Criteria: B1ab(v)+2ab(v)  
CITES Status (Convention on International Trade in Endangered Species): Not listed  
EDGE Program; 34 in the list of EDGE priority species.

### Threats:

The Lake Oku frog is threatened with extinction through unpredictable mortality (possibly from disease), from the possibility of catastrophic introduction of fish to their habitat, invasion by other *Xenopus* species, and by changes to the ecology of Lake Oku.

### Proposed *ex situ* roles (Ark; Rescue; Supplementation; Research; Education):

Rescue, Research, Education

**Husbandry guidelines (Y/N, if yes give details and/or hyperlink):**

In preparation. The recent establishment of a sizeable population at Antwerp Zoo is providing information needed to establish preliminary husbandry guidelines for survival. At the date of this AArk TMP, *Xenopus longipes* has not yet been bred in captivity. There is good background for husbandry as there are 20 various taxa of *Xenopus* in the commercial *Xenopus* stock centre in Geneva. [www.xenopus.com](http://www.xenopus.com)

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**Programme Goal:**

- Establish a 'Rescue Population'.
- Securely distribute this population among at least two institutions.
- Maintain genetic diversity.
- Develop educational exhibits.
- Conduct a research program.
- Support in-range conservation.

**ACTION PLAN****Ex situ population management****Current population (no. of individuals and/or institutions):**

Current rescue populations:

Antwerp Zoo	Belgium	47	Dr. Robert Browne
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Current research populations:

London Zoo	United Kingdom	37	Dr Ian Stephen
McMaster University	Canada	8	Prof. Ben Evans
Bristol University	United Kingdom	few*	Dr. Richard Tinsley
Columbia University	USA	?*	Dr. Darcy Kelly

\* Quantities of specimens to be declared.

Biobanked viable germplasm:

Skin from one female cryopreserved – Antwerp Zoo.

**Target population (no. of individuals and/or institutions):**

Target international 'Rescue Population' 50:50 split across at least two collections.  
New 'Rescue Population' within Cameroon.  
Several research collections have requested additional *X. longipes* for the 'Rescue populations'.

**Objectives (clearly defined and measurable):**

- Genetically viable Rescue Population (as in 'Target population') established and breeding (self sustaining) in two to three institutions.
- Genetic representation in a bio-bank of all founders, sperm from males, somatic cells from both males and females.
- Supplementing of research populations with males.
- Priority to reproduce from all founders.
- Limit reproduction from F1 to avoid confusion with founders.
- Establish a stud book and record keeping system.
- Establish and maintain taxon management for *X. longipes*.

#### Proposed actions and respective time frames:

- Taxon coordinator making annual recommendations for the management of the species to all participating collections.
- Identify partner institutions wishing to work with *X. longipes* 2009.
- Import founders and establish rescue populations.
- Identify Cameroonian partner institution 2009; possibly University of Yaoundé I,
- Identify Cameroonian partner institution 2009; possibly Cameroon Biodiversity Conservation Society.
- Assist in establishment of facilities and training of personnel in Cameroon 2009-11.
- Supply surplus F1 frogs from the 'Rescue Population' to other projects 2009.

#### Ex situ Research

#### Current research objectives and expected time frames:

- Develop and refine husbandry techniques.
- Develop and refine techniques for unassisted spawning.
- Develop and refine techniques for hormonal assisted spawning.
- Develop and refine techniques for hormonal sampling of sperm.
- Develop and refine techniques for *in vitro* fertilisation.
- Assess the genetic variation of the population.
- Find age, growth rates and periods of low growth.
- Show fecundity and reproductive strategies.

Comment [td1]: Why not males too?

#### Proposed study objectives and expected time frames:

- An assessment of the genetic variation of the wild and *ex-situ* population of the Lake Oku frog.
- Maintenance of genetic diversity as part of a population management action.
- Continued assessment of disease.

#### Actions necessary to meet study objectives:

- The primary institution at Antwerp Zoo will engage all *ex situ* research objectives. These will be done in a co-operative network with other participating institutions particularly the Zoological Society of London.
- Investigate tools such as skeletochronology to find age, growth rates and periods of low growth.
- Investigate archived museum specimens to determine fecundity and female reproductive strategies.

- Support growth and reproductive information of conservation breeding populations with data from specimens in the field..

### Ex situ Education

#### Educational message:

- The Lake Oku frog is a unique and interesting species.
- Lake Oku has an interesting bio-cultural history, and this frog is a flagship for its conservation.
- Conservation of frogs in Cameroon can support general habitat and species conservation.
- We can save species in AArk conservation breeding programs.
- *Xenopus* frogs have greatly contributed to the development of biology and medicine.
- There are many other endangered frogs in Cameroon; what values to humanity will be lost if they become extinct.
- Mountains can act like islands with regard to driving biodiversity, with amphibians as model organisms that speciate on different mountain tops.
- Gene banking and community conservation as conservation tools.

#### Objectives (clearly defined and measurable):

- Display of *Xenopus* with educational theme as above in Cameroon/ Europe
- Education about gene banking including human gene banks.

#### Proposed actions to meet above Educational Objectives with time frame:

- Visitors will see educational display with live *Xenopus longipes* and a poster display.
- Schools and other groups will be given talks.
- Visitors are informed of the role of captive breeding programs for species conservation.
- Greater publicity of all work at Lake Oku, and for ex situ programs.
- Adult display established at Antwerp Zoo in 2008 (done)
- Posters (in production).
- Zoo magazine articles.

#### Any other information:

Should ecotourism become more organised for this region of Cameroon, the possibility of using this programme as a form of promoting ethical holidays to prospective ecotourists should be explored.

### In-country/field initiatives

#### Current activities:

- Establishing an interpretative sign at Lake Oku.
- Surveys and habitat studies of the Lake Oku frog.
- A conservation project has been conducted on Mount Oku for several years by BirdLife International/Cameroon Biodiversity Conservation Society, involving community forest management.

#### Objectives (clearly defined and measurable):

- Thorough understanding of the conservation biology of *X. longipes* including life history stages, their micro-habitat requirements and population demography.

- Adequate, continuous protection of Lake Oku to sustain a long-term viable population.
- Enhanced local knowledge and understanding that promotes a pride/value in the species.
- Particular emphasis on the prevention of exotic fish species release into Lake Oku.
- A study of diseases causing mortalities in Lake Oku.

#### Proposed actions and respective time frames:

- Conduct thorough field surveys to assess population and demography.
- Petition for Lake Oku to receive increased protection.
- Identify the cause and epidemiology of diseases.
- Identify the genetic variation of the total population and design an *ex situ* program to ensure the maintenance of genetic variation.
- Design and implement a local education and awareness programme.
- Promote alternate sources of protein to the introduction of fish.
- Assist community involvement and field work.

#### Long term goal (exit strategy):

- The cryopreservation of the genetic diversity of the Lake Oku clawed frog.
- Reliable methods for reproduction and larval rearing.
- The reduction in numbers of individuals, and distribution of the 'Rescue Population' to three institutions.
- Protection of the habitat and wild population through capacity building of local scientists and rural developers, as well as developing sustainable programs, which may include ecotourism.

#### References

##### Publications/reports:

Doherty-Bone, T. (Ed.) (2007). *Belo Community Herpetological and Conservation Project 2006 – Final Report*. Expedition report submitted to the University of Aberdeen and Royal Geographical Society

GAA. IUCN, Conservation International, and NatureServe. 2006. Global Amphibian Assessment. <[www.globalamphibians.org](http://www.globalamphibians.org)>. Accessed on 04 May 2006.

Gartshore, M.E. 1986. The status of the montane herpetofauna of the Cameroon highlands. Conservation of Cameroon Montane Forests. Stuart, S.N., editor. 204-240. International Council for Bird Preservation. Cambridge, U.K.

Kobel, H.R., Barundun, B. and Thiebaud, C.H. 1998. Mitochondrial rDNA phylogeny in *Xenopus*. Herpetological Journal. 8:13-17.

Loumont, C. and Kobel, H.R. 1991. *Xenopus longipes* sp. nov., a new polyploid pipid from western Cameroon. Revue Suisse de Zoologie. 98:731-738.

Tinsley, R.C. and Kobel, H.R., editor. 1996. The Biology of *Xenopus*. Zoological Society of London, Clarendon Press. London.

##### Bibliography:

Refer to *Xenopus longipes* Species Profile