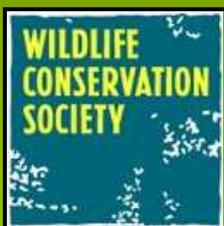
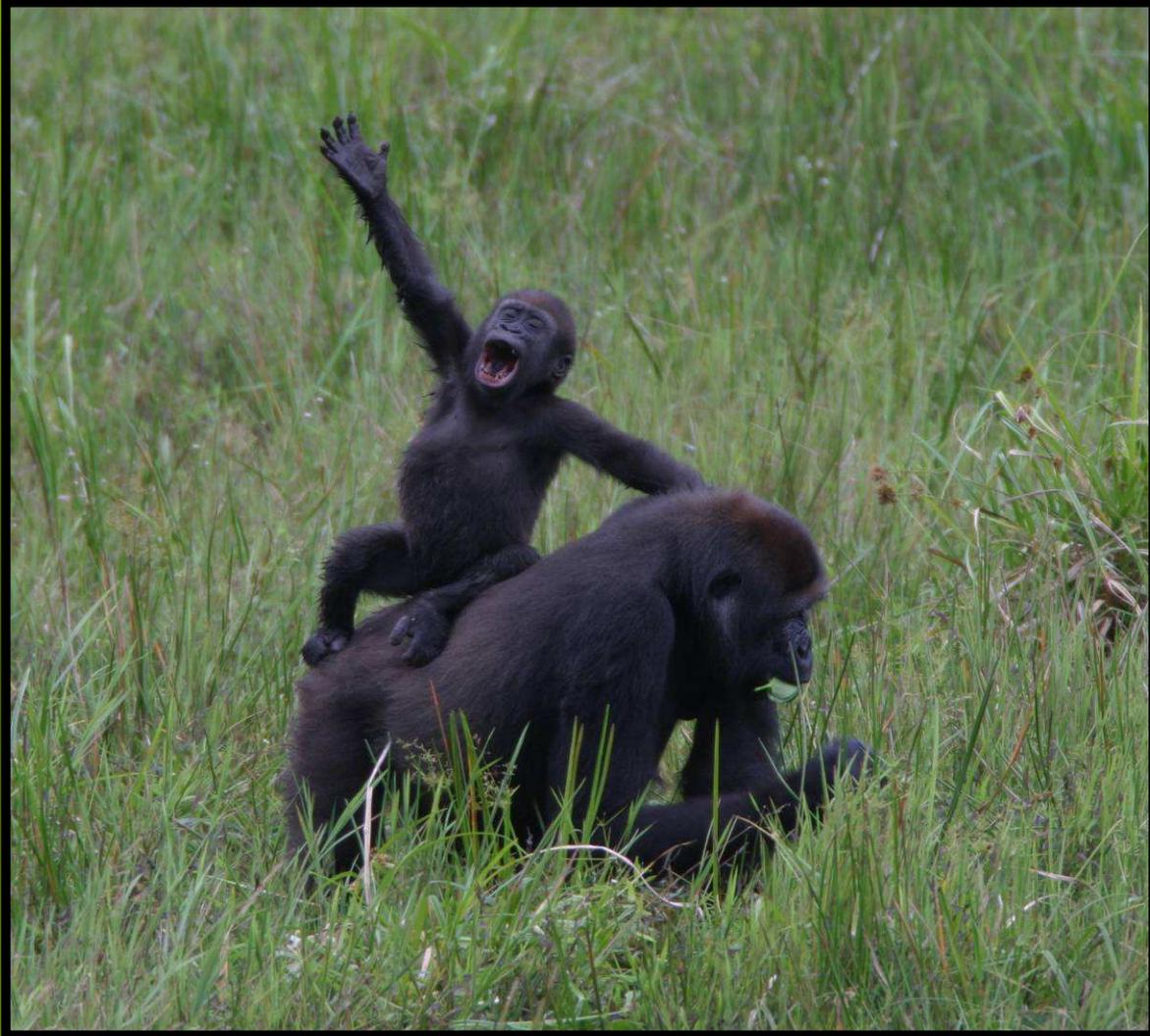


# **MBELI BAI STUDY**

## **Annual Report 2008**



**by Thomas Breuer**



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# GORILLA - BACKGROUND

Large mammals, including western gorillas are important **flagship species** that raise public support for conservation. The future of the charismatic western gorilla is uncertain because of its **rapid population decline** due to various threats, such as commercial hunting for bushmeat, loss of habitat, and diseases such as Ebola hemorrhagic fever. Recent finding of extremely high numbers of gorillas in **northern Congo**, demonstrate that this region is of **highest conservation importance**

(<http://www.wcs.org/gorilladiscovery/press-release>) and that **information gained from long-term studies on the population dynamics and demography of western gorillas is urgently needed in assessing the vulnerability of populations to specific threats**, and to evaluate how populations might be affected by these threats and how populations that have undergone drastic decline can potentially recover.

**In situ study is imperative** for a more comprehensive knowledge of western gorilla natural history particularly for scenarios of population growth. Our current **knowledge about gorilla life history patterns comes predominantly from one high-altitude mountain gorilla** population and long-term study site (Karisoke Research Center) located at the extreme range of gorilla distribution in the Virunga Volcanoes. However, **western gorilla habitat differs from that of mountain gorillas**: in lowland forests terrestrial herbaceous vegetation occurs at lower densities and is more patchily distributed. **Western gorillas are more frugivorous** than mountain gorillas with fruiting trees being more abundant but showing large seasonal variation in fruit availability. Differences in resource availability combined with reduced folivory could have direct

**effects on western gorilla development and mortality** leading to slower life histories (particularly to a later weaning age) and probably higher infant mortality, important life history milestones that affect the growth rate of a population.

In contrary to mountain gorillas, western gorillas are extremely **difficult to study in the dense forest** vegetation that comprises much of their habitat. Hence, up to date there are only two fully habituated western gorilla groups (Makumba group at Bai Hokou and Kingo group at Mondika) and the demographic data from these two groups is insufficient for modeling the population dynamics of western gorillas. Furthermore, the slow reproductive rate of gorillas makes the collection of life-history data in particular a time consuming process that demands a long-term research investment.

Last year, western gorillas were classified as **critically endangered** by the IUCN and it is therefore necessary, now more than ever, to assess the vulnerability of western gorillas to these threats. The reclassification was **based on projected population decline**. Recent findings of more than 100,000 gorillas in **Congo** does not impact this assessment but rather provides an **opportunity for conservation** and a challenge in the prevention of Ebola spread, which is assumed to happen predominantly through ape-ape disease transmission in areas where gorillas occur at high density and in high numbers. Nevertheless the data used for the **status reassessment comes from a simple guess of the generation length of western gorillas** and we **urgently need empirical life history** data on this largely unstudied great ape species.

# MBELI BAI STUDY - BACKGROUND

The only study that can fill this gap of information is the Mbeli Bai Study (MBS) where researchers have been continuously **monitoring** western gorilla visiting this forest clearing since February 1995.

In northern Congo, western gorillas make regular use of swampy clearings for food, thus providing a unique opportunity to observe and monitor the status of their populations in this region. Although 'bais' account for less than 5% of vegetation type in the region they are of **extreme ecological importance to a number of large forest mammals** also including forest elephants (*Loxodonta africana cyclotis*), sitatungas (*Tragelaphus spekeii*) and forest buffalos (*Syncerus caffer nanus*).

Mbeli Bai is a 13 ha large swampy forest clearing in the Nouabalé-Ndoki National Park (NNNP) (4,200km<sup>2</sup>) in the north of the Republic of Congo with **minimum levels of disturbance**, where "bai's" (bai is the local name for forest clearing) like this are believed to offer important **nutritional (mineral) benefits** to many mammal species.



Photo: Jeffrey Donk/Marleen Azink/Fotonatura

Aerial view of Mbeli Bai

The NNNP with its low levels of disturbance represents an important **stronghold for western gorillas** and other endangered forest mammals. Saving this habitat to ensure the survival of the western gorilla is of global conservation priority.

## **MISSION STATEMENT OF THE MBELI BAI STUDY:**

**Enhance our knowledge of western gorillas and improve their conservation status in the Nouabalé-Ndoki National Park and elsewhere through applied research, national capacity building, international awareness raising and local community outreach programs.**

Since the end of the 1990s WCS is working in the north of the Republic Congo and in 1993 together with the Ministry of Forest Economy and Environment has created the NNNP. The MBS is part of a larger conservation project in northern Congo initiated by the Wildlife Conservation Society (<http://www.wcs-congo.org>); the Nouabalé-Ndoki Project, a collaboration of WCS and the Government of Congo, which strives to maintain strong links with the two local communities living around the NNNP through a participatory approach to conservation.

At Mbeli Bai more than **350 gorillas have been monitored** (actual population ~140 western gorillas). The results of the monitoring of individual identifiable animals at Mbeli Bai has provided major and unique insights into the social organization and behavior of this elusive species and has reported many **spectacular behavioral observations** such as twin births, silverback splash displays, face-to-face copulation and the first observation of tool use in free-ranging gorillas; findings that have attracted significant international media attention.

Our monitoring provides **baseline life history data** (birth rates, mortality rates, inter-birth intervals, age at first

# MBELI BAI STUDY - BACKGROUND

parturition) of an intact gorilla population that can be used to model the population dynamics of this gorilla population.

Furthermore, the MBS aims to **understand the ecological** (e.g. density and availability of food resources (fruiting trees, aquatic and terrestrial herbaceous vegetation)) **and social importance of forest clearings** for large mammals and its influence on large mammal density.

Direct observations of gorillas and partially other wildlife at Mbeli Bai are used as a tool for monitoring wildlife health in collaboration with the WCS- Field Veterinary program (<http://www.fieldvet.org/>).

We investigate how gorillas use bais and how bais, in turn, shape gorilla population dynamics. These results will help to understand the ecological and social importance of forest clearings for those mammals, and therefore inform planning for habitat zoning (i.e. in logging concessions that are situated around NNNP).



As in the past, we hope that this **annual report provides useful insights** how this small project contributes to our **understanding of rain forest wildlife**, particularly gorillas and to the conservation of NNNP and its periphery. We aim to demonstrate how we have **expanded our conservation activities** as an **important immediate and long-term response to mitigate the threats gorillas and other large mammals are**

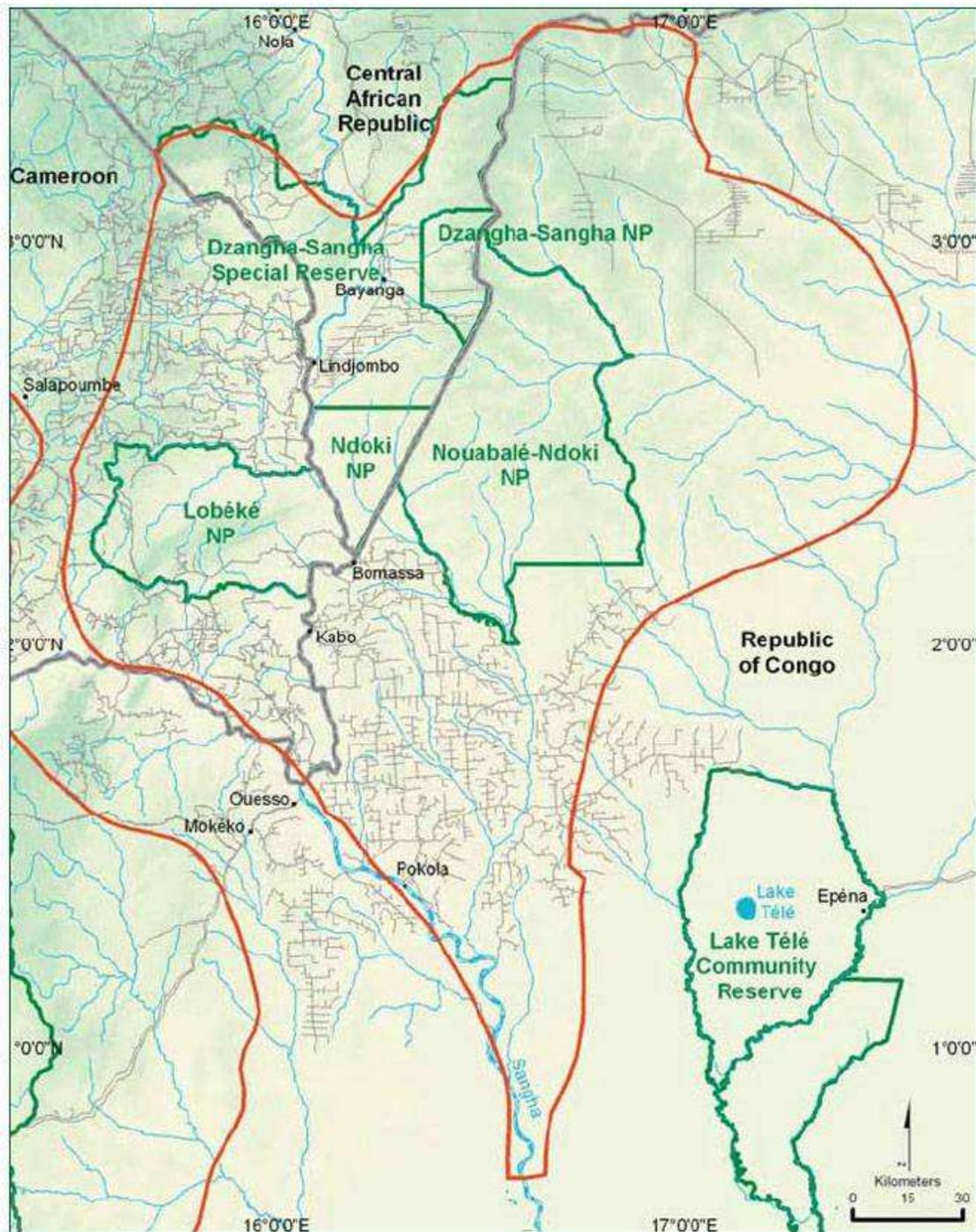
**facing** in Western Equatorial Africa. We also provide an **outlook** of activities planned for **2009**.

## **PROJECT GOALS:**

- **Inform conservation strategies by increasing our understanding of population dynamics of western gorillas, understanding and highlighting the importance of forest clearings (Bais) and determining the ecological factors influencing gorilla and large mammal density around Mbeli Bai.**
- **Improve the capacity building and training of national research staff and conservation educators**
- **Continue and expand our site-based conservation education program (Club Ebobo) with local communities and internationally through educational ecotourism visits**
- **Provide an effective deterrent to poaching around Mbeli Bai and the expansion to other Bais to act as an early warning system to the park's law enforcement team.**

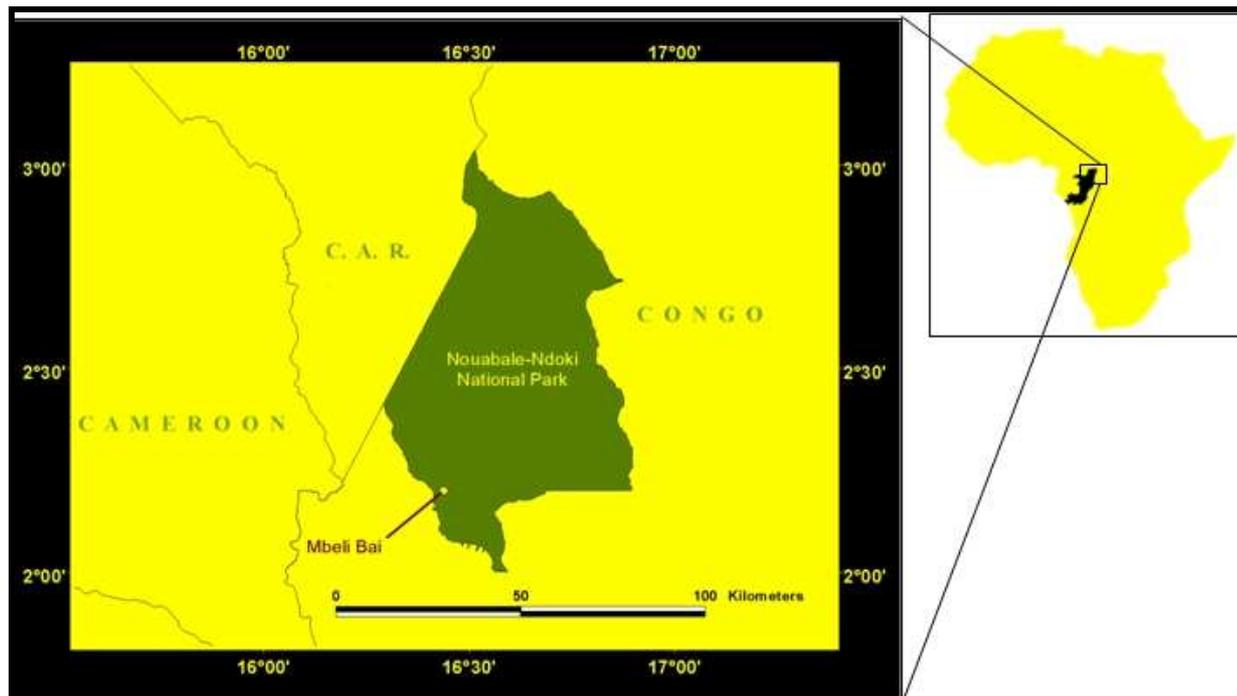
# STUDY AREA - BACKGROUND

The Sangha Trinational complex (27,908 km<sup>2</sup>) is one of seven exceptional priority areas for gorilla in Western Equatorial Africa and probably harbours the largest populations of western gorillas throughout their range. The NNNP in northern part of the Republic Congo has never been logged provides enormous opportunities for conservation. The human population density is relatively low (1-2 inhabitants / km<sup>2</sup>) and all conservation approaches, such as Ecoguard missions and ecotourism activities are coordinated together with the neighbouring protected areas Cameroon and Central African Republic. Apes are considered flagship species for the rainforest protection.



Map of the Sangha Trinational Complex - Source: State of the forest 2006 - CARPE

# STUDY AREA - BACKGROUND



Location of Mbeli Bai in the NNP



View of the observation platform (mirador) at Mbeli Bai



View from the observation platform

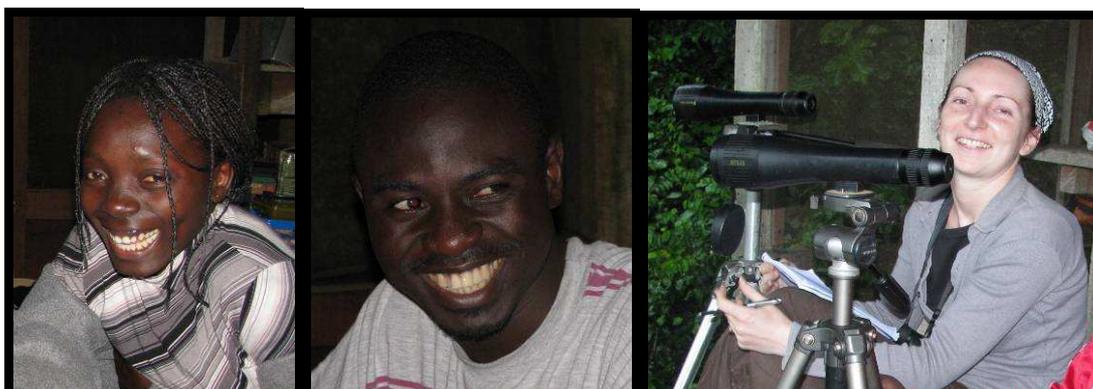
# MBELI BAI STUDY - STAFF

Our research team has been growing in 2008 with a total of six researchers and up to six local workers from the local village Bomassa (all Bangombe pygmies) as camp assistants and trackers on the ground. Furthermore we work closely together with local teachers in the villages surrounding the NNNP.

## Researchers:



*Thomas Breuer, PhD:* Principal investigator since 2002: German  
*Mireille Breuer-Ndoundou Hockemba:* Researcher since 2002: Congolese  
*Franck Barrel Mavinga:* Research assistant and educator since 2006 Congolese



*Hardy Massengo:* Research assistant and educator since 2008: Congolese  
*Gatien Ulrich Massengo:* Educator since 2008: Congolese  
*Kelly Greenway:* Research assistant since 2008: British

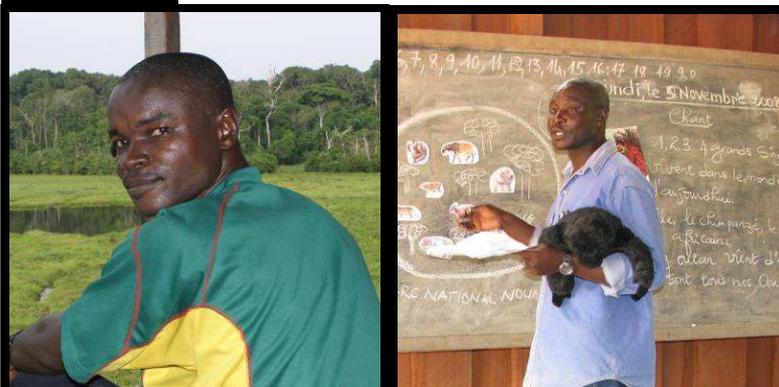
# MBELI BAI STUDY - STAFF

## *Camp assistants and trackers:*



*Lazard, Limbanga:* Camp assistant and tracker since 2003: Congolese  
*Fis:* Camp assistant and tracker since 2008: Congolese  
*Emelie, Jean-Claude:* Camp assistant and tracker since 2003: Congolese  
*Poungue, Maurice:* Camp assistant and tracker since 2006: Congolese  
*Mosombo, Felix:* Camp assistant and tracker since 2000: Congolese  
*Mbekolo, Alexandre:* Camp assistant and tracker since 2003: Congolese

## *Teachers:*



*Remy Elanda:* Director of the school in Bomassa – collaborating with Club Ebobo since 2000  
*Jean-Pierre Koyas;* Teacher at the local school in Bomassa – collaborating with Club Ebobo since 1998

# CONSERVATION RESEARCH - Gorillas

Long-term studies, such as that at Mbeli Bai can provide **crucial demographic and life history data** which improves our understanding of life history evolution and adaptation and help to refine conservation strategies. Indeed recent findings from Mbeli Bai demonstrate that in this western gorilla population, **infants are weaned at a later age** (4 years compared to 3 years in mountain gorillas), have **higher infant mortality** (43% to age 3 compared to mountain gorillas (27.1%) and have much longer inter-birth intervals which **could translate into a slower growth rate**. Thus, the slow life histories of western gorillas could have **major consequences for social structure, mortality patterns and particularly on population growth rates that will affect recovery from population crashes and prospects of survival of this critically endangered great ape species**.

## Anticipated workplan and achievements in 2008 - Gorillas

### **Continue with the daily monitoring at Mbeli Bai and monthly phenology studies**

- *Yes: Monitoring at Mbeli Bai for a total of 364 days*
- *Yes: Monthly phenology data collection*

### **Establish gorilla monitoring at two other bays**

- *In progress: Location of camp and observation platform (mirador) identified and wood for mirador construction purchased*

### **Application of photogrammetric methods to investigate gorilla growth patterns**

- *Yes: Continuous data collection and publication of preliminary data in American Journal of Primatology (see Communications)*

### **Revision of age-boundary for western gorilla life history classes**

- *Yes: Manuscript published in American Journal of Primatology (see Communications)*

### **Full demographic analysis of an undisturbed gorilla population initiated**

- *Yes: Gorilla data base up to date and collaborators for population analysis identified: Prof. Tim Coulson, Imperial College London; Prof. David MacDonald, WildCRU, Oxford University; Dr. Martha Robbins and Andrew Robbins, Max Planck Institute for Evolutionary Anthropology, Leipzig*

### **Gorilla group spread analysis and comparison with mountain gorillas initiated**

- *Yes: Currently analysed by Dr. Joanna Hutchinson, Chester University – other collaborators: Dr. Allison Fletcher, Chester University and Dr. Shelly Masi – MNHN – Paris*

### **Analysis of gestural communication in western gorillas**

- *Yes: Manuscript published in Animal Cognition (see communications)*

### **Genetic analysis of Mbeli Bai gorillas**

- *In progress: part of PhD of Militia Arandjelovic (PhD candidate) – MPI-EVAN*

### **Hormonal Analysis of Mbeli Bai gorillas**

- *No: collaborators: Dr. Tobias Deschner – MPI-EVAN – samples collected: pilot study probably in 2009*

### **Nutritional analysis of bai plants and comparison with forest plants**

- *No: laboratory not identified yet: potential collaborator: Dr. Shelly Masi – MNHN – Paris*



# CONSERVATION RESEARCH - Other mammals

In 2008 we continued the daily data collection on bai visiting patterns and demographics of all other mammals visiting Mbeli Bai. In addition to the gorilla data, this provides us with unique inside information on the importance of forest clearing for these mammals. The MBS is currently providing the only long-term demographic study on sitatunga (unique life history data on over 80 sitatungas since 1995) in Central Africa and the second longest demographic study on forest elephants (long-term data on more than 250 forest elephants after a period of intensive poaching before the start of MBS). Analyses of bai visitation and grouping patterns of other large mammals, i.e. elephants, is providing important information on the role of bais in determining large-scale associations and population structure.

## Anticipated workplan and achievements in 2008 - Other mammals

### **Continue with the daily monitoring of large mammals at Mbeli Bai**

- *Yes: Monitoring at Mbeli Bai for a total of 364 days*

### **Determining the ecological and social factors influencing the use of Mbeli Bai by large mammals**

- *Yes: Continuous records of bai visiting, climatic and phenological data.*

### **Demographic analysis of elephants initiated**

- *Yes: All elephant visits are currently verified and data will be synthesized during an elephant bai monitoring workshop that is organized by Thomas Breuer in March 2009*

### **Elephant association and grouping patterns**

- *Yes: Manuscript published in *Pachyderm* (see communications)*

### **Elephant stature and displacement analysis**

- *Yes: Continuous data collection on elephant stature – analysis in late 2009 / begin 2010: Collaborators: Victoria Fishlock – University of Stirling*

### **Investigate growth patterns to define life stages and population structure (forest elephants)**

- *No: Difficulties of obtaining sufficient data on non-adult elephants*

### **Demographic analysis of sitatungas initiated**

- *Yes: All sitatungas visits are currently re-identified and data is updated in excel databank – analysis probably begin 2010*

### **Basic life history patterns of forest buffaloes**

- *Yes: All buffalo visits are currently re-identified and data is updated in excel databank – analysis probably begin 2010*

### **Investigate the potential to study other mammals at Mbeli Bai (e.g. radio-telemetry studies of otters)**

- *Yes: preliminary contacts have been made with Otter researchers at WildCRU*

### **Continuation of mammal encounter study along the forest path to Mbeli Bai**

- *Yes: data collection continued in 2008*

### **Continuation of elephant, duiker,... dung decay study**

- *Yes: data collection continued in 2008*



# CONSERVATION RESEARCH - Large mammal surveys

Given the difficulties of censusing large mammals in the dense African rain forest, we currently only have limited information on their abundance and distribution. Commonly used methods using direct counts are impossible to conduct in the dense rain forest and due to the elusive nature of most species. Hence it is important to improve indirect census methods (line transect counts of nests and/or dung) and various calibration factors (dung/nest decay, encounter rates,...) and to incorporate other innovative methods ideally combined at one site. In 2008 we have published some of these improvements for censusing elephants and duikers in the Ndoki forest.

## Anticipated workplan and achievements in 2008 - Census methods

### **Analysis of large mammal line transect study**

- *Yes: Analysis progressed during the participation of a DISTANCE training workshop at the Centre for Research into Ecological and Environmental Modelling (CREEM), University St. Andrews.*
- *We are currently waiting for nest decay data and nest builder features from the nearby Goulougo Triangle to convert our ape abundance measures to gorilla / chimpanzee density measures. Collaborator: Dr. Samantha Strindberg, Living Landscapes Program, Wildlife Conservation Society*
- *Preliminary results indicate an ape density of around 2 nest builder / km<sup>2</sup> and an elephant density of around 1 / km<sup>2</sup>.*

### **Publication of duiker dung decay information**

- *Yes: Manuscript submitted to African Journal of Ecology (see communications)*

### **Comparison of estimates of gorilla population size from three bais with results from line transect nest surveys (survey conducted in 2005)**

- *No: Data collection at other bais postponed (see above)*

### **Application of other innovative methods (remote video camera) to estimate gorilla population size**

- *No: Remote video camera had to be given back to MPI-EVAN*

### **Collection of fecal sample for genetic approach of estimating gorilla density**

- *No: No further samples were collected on the path from the camp to the bai, but it is planned to increase sampling while monitoring at the other bais and during a second line transect survey that is planned for 2010*



# CAPACITY BUILDING

The MBS trains research assistants and educators to promote wildlife conservation and the role of the Nouabalé-Ndoki National Park, in particular through the conservation education program Club Ebobo (see below). In 2008 we have continued to employ Congolese nationals as research assistants with the aim to increase their capacity in all areas of research methodology and natural resource monitoring. The Congolese research assistants are trained on a daily basis (by the principal investigator, an ex-pat assistant, or a Congolese researcher) in data collection, analysis and presentation of results. Some highlights of the capacity building component of the MBS are:

## Continuous mentoring and on-the-job training of 3 Congolese research assistants - National research staff integrated into research, monitoring and education program at all levels

Franck is in its 3<sup>rd</sup> year and will soon start an independent study at two other bails. Furthermore Franck is currently updating the elephant database and will present the MBS at the elephant bai monitoring workshop in March 2009 (see below).

Harddy has successfully been trained in bai and phenological monitoring and is currently updating the sitatunga database.

Gatien has recently been employed and is starting to learn the phenological survey and basic bai monitoring data – however, his main responsibilities will be in the lead of Club Ebobo. Since October 2008 he has been preparing and leading the Club Ebobo sessions together with Franck and the different teachers.

## New employment of ex-pat. research assistant

Kelly Greenway, who holds a MSc in primate conservation from University of Oxford Brookes has replaced Julia Jenkins in September and has successfully been trained in the bai monitoring and is currently updating the buffalo database

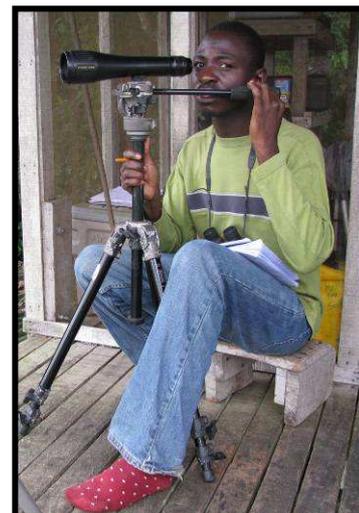
## Masters course of former research assistant

In September Mireille Breuer-Ndoundou Hockemba has started a Masters course (Plant taxonomy and biodiversity) at the University of Edinburgh and the Royal Botanical Garden under a Darwin Initiative stipend – thanks to Dr. David Harris for making this possible. It is planned that Mireille will return to Mbeli after the Masters course.



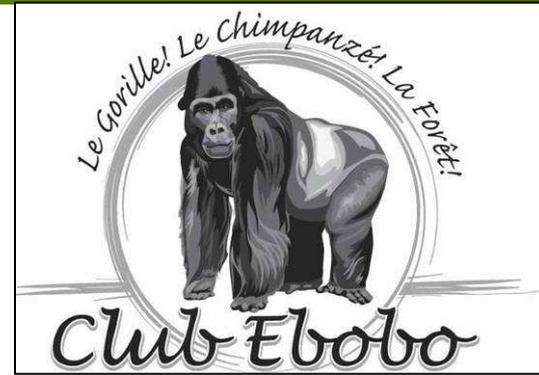
## Field course in ape ecology

Franck has successfully attained a 10-week workshop on ape monitoring techniques in the Lopé NP in Gabon.



# CONSERVATION EDUCATION

If we want to ensure the long-term survival of the great apes and limit the risk of diseases transmission, we need to change the attitudes of locals towards the intrinsic value of wildlife in general and the importance of conserving the great apes in particular. Thus, public outreach and awareness programs can play a vital role in the list of actions needed to guarantee that great ape populations remain viable. Long-term education programs have to be put in place with the aim of changing the attitudes of local people to the value of wildlife. If we want to ensure the survival of great apes in the future we also have to address our conservation effort to the future generation – the children. Long-term studies are uniquely placed to establish a trust and respect relationship between scientists/conservationists and the local community.



Since 1998, the MBS has been running a site based conservation education project, “Club Ebobo” (Ebobo is the local name for gorilla), in several local schools around the NNNP. Club Ebobo has the objective to teach the school children about the fauna and flora of the region’s ecosystem so that they appreciate and take pride in the biodiversity that exists in their region. Such increases in knowledge and changes in attitudes will discourage the trade of illegal bushmeat by reducing the likelihood that the current generation of schoolchildren will consume or trade bushmeat in the future.

## Anticipated workplan and achievements in 2008 - Conservation Education

### Hold Club Ebobo sessions and train educators in the three ‘education centres’

- *Yes: Monthly sessions in Bomassa, Makao-Linganga and Sombo (Thanry Congo). We have also introduced Club Ebobo in the college and in a pygmy school in Sombo. Additionally we have conducted discussions and video / photo projections with the Bambenzele and Bangombe pygmies (see Photo to the right).*



### Provide Club Ebobo t-shirts and basic school material to all pupils

- *Partly: We distributed basic school material to pupils and teachers but will only distribute Club Ebobo t-shirts in 2009*

# CONSERVATION EDUCATION

## Club Ebobo manual and education book completed and printed

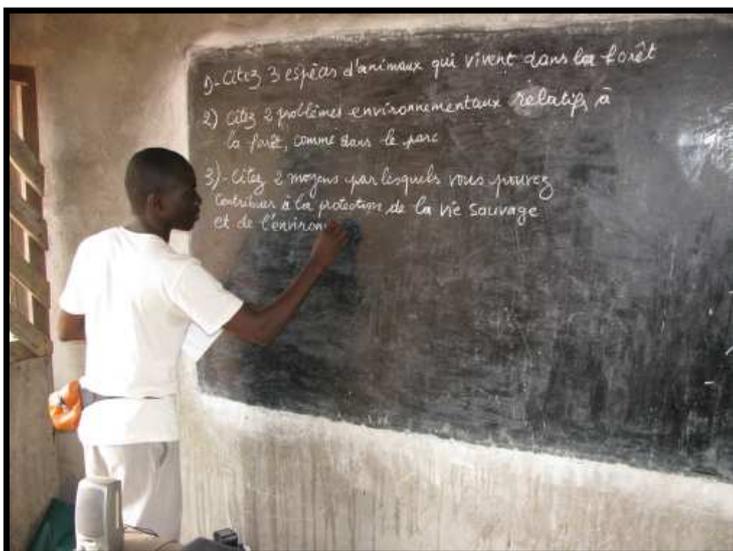
- *Partly: Together with colleagues from the Primate Conservation group of the MPI-EVAN we have finished the education book for Club P.A.N. (<http://www.wildchimps.org/wcf/english/pan/index.html>) and will print the book for the school year 2009/2010.*

## Facilitate visits to Mbeli Bai by pupils and local villagers

- *No: Due to logistical issues and lack of funding we could not invite pupils and villagers to Mbeli Bai*

## Produce poster that inform local people about the legal status of protected species, such as gorillas and elephants

- *Partly: We designed various templates and the education coordination in of WCS-Congo in Brazzaville has a pending proposal that intends to produce posters.*



## Standard evaluation schemes incorporated

- *Yes: We incorporated a simple questionnaire consisting of 7 questions that test the knowledge, attitude and behaviour of children in the different schools. Photo shows Gatién writing down the 7 questions on the blackboard. However, evaluations remain challenging due to the fact that most pupils cannot read and write.*

## Explore the potential of a nation-wide Club Ebobo program

- *Yes: We conducted various awareness missions with educators from another WCS project in the logging concessions surrounding NNNP (PROGEPP) and have successfully synthesised both education project and have successfully introduced Club Ebobo in the logging town Loundoungou (see PROGEPP educator Jean-Claude to the right).*



# CONSERVATION EDUCATION



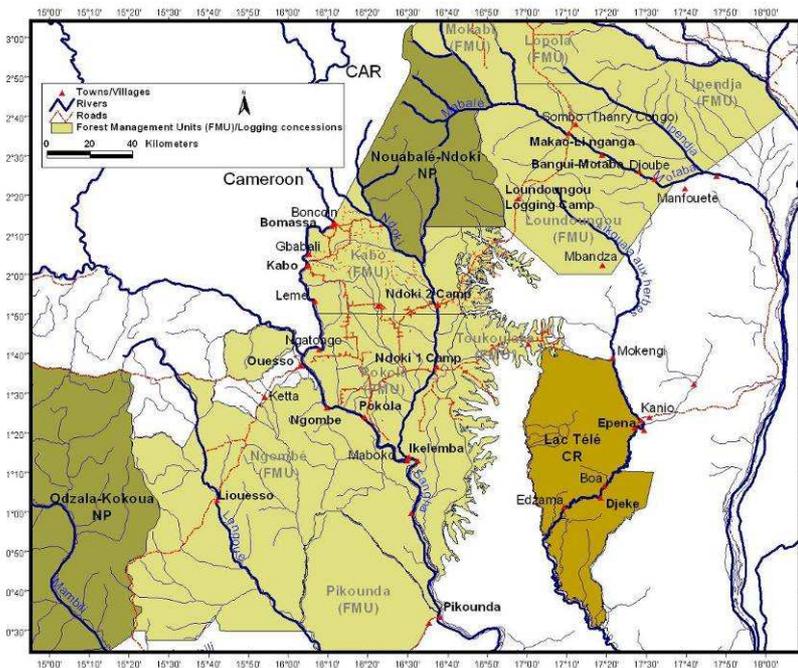
Collaboration with other environmental education programs (WCS-Gabon, INCEF (<http://www.incef.org>), Club P.A.N. (WCF),...) and zoos (e.g.: “wild research”)

- Yes: We have also started collaboration with other conservation education projects such as those of WCS-Gabon ([www.wcsgabon.org](http://www.wcsgabon.org)) and through a platform (<http://africanprimates.net/PECAN.htm>) that will be established by the International Primatological Society (to which the PI is actively contributing). We also intensively work with AZA institutions to help zoo

awareness programs within the WILD RESEARCH (<http://wildresearch.org/>) consortium.

## Continue support of ecotourism program at Mbeli; facilitate media visits

- Yes: We have successfully hosted many tourists and delegations at Mbeli Bai (Photo to the right shows a visit of a US delegation, including representatives from the US embassy and the Congo Basin Forest Partnership (CBFP))



Location of the villages around Nouabalé-Ndoki National Park in northern Congo, where Mbeli Bai Study researchers have been conducting environmental education through its Club Ebobo (Credit of map: Patrick Boundja / WCS-Congo).

# HABITAT PROTECTION

Through researchers' the MBS aims to provide an effective deterrent to poaching around Mbeli Bai. Our presence in the study area will provide immediate protection of the south-west of NNNP. Mbeli Bai (a formerly elephant poaching area) has been **free of poaching for the last 13.5 years**. The researchers' presence acts as an early warning system for illegal human activities in the western part of the NNNP (a highly strategic location). We work closely together with the park staff and are in frequent contact in case of any sign of illegal activities. The researchers' presence at the two new

bais will expand the study area and help to act as an early warning system for illegal human activities in the western part of the NNNP.

We are also employing several BaNgombe pygmies from the local villagers as camp staff some of which have formerly been poachers. Five camp assistants (all BaNgombe pygmies) and several temporary guides and porters are employed by the MBS. It is anticipated that the other bai studies will result in the employment of additional staff this year and we will expand the study area and therefore enlarge the direct habitat protection.

# COMMUNICATION & PUBLICATIONS

As important as conducting the conservation activities, is the dissemination of their results. Through dissemination of results we will increase the level of understanding and support for conservation from a national and international audience. We are distributing our annual reports (detailing all activities and results of the study) to all donors, the Wildlife Conservation Society, the Nouabalé-Ndoki Project, and the Ministry of Forest Economy of the Republic of Congo. Reports will be distributed regularly to Park managers, national government staff, regional, collaborators and the international conservation community.

Dissemination of results to protected area and buffer zone managers in the region was further facilitated through regular meetings. We are providing information for the WCS-Congo web-site and ensure that

donors are updated on the progress of the study through the circulation of e-mails. Furthermore we are providing photographs and videos that will help to promote gorilla conservation (see also

<http://www.wcs.org/gorilladiscovery/press-release>). In 2008, the principal investigator Thomas Breuer has been in Germany to write for some months to write up his PhD "*Reproductive success in wild male western gorillas*" which also gave him the chance to proceed with the writing up of the results and publication of manuscripts, so that the results will be available for the scientific community.

In 2008 Thomas Breuer also made an effort to visits various conferences and donors of the MBS. Below is a list of publications that have been made in 2008/09 and the presentations that have been given.

# COMMUNICATION & PUBLICATIONS

## Thesis:

**BREUER, T.** (2008) *PhD thesis* Male reproductive success in western gorillas (*magna cum laude*) - Max Planck Institute for Evolutionary Anthropology / University of Leipzig.

## Peer reviewed publications:

**BREUER, T.** (submitted) Education for the conservation of great apes in northern Congo – the role of capacity building and outreach programs. *American Journal of Primatology*, Special Issue

**BREUER, T.** (submitted) Dung decay and its implications for population estimates of duikers (*Cephalophus spp.*) and red river hogs (*Potamochoeros porcus*) in the Nouabalé-Ndoki National Park, Republic of Congo. *African Journal of Ecology*

**BREUER, T., BREUER-NDOUNDOU HOCKEMBA, M., OLEJNIZCAK, C., PARNELL, R.J. & STOKES, E.J.** (2009) Physical maturation, life history classes and age estimates of free-ranging western gorillas at Mbeli Bai, Republic of Congo. *American Journal of Primatology*, 71(2): 106-119.

**GENTY, E., BREUER, T., HOBAITER, C., & BYRNE, R.W.** (2009) Gestural communication of the gorilla (*Gorilla gorilla*): repertoire, intentionality and possible origins. *Animal Cognition*, available online

**FISHLOCK, V., LEE, P.C. & BREUER, T.** (2008) Quantifying forest elephant social structure in Central African bai environments. *Pachyderm*, 44: 17-26.

**BREUER, T. & NDOUNDOU HOCKEMBA, M.** (2008) Fatal interaction between two male Sitatungas (*Tragelaphus spekei gratus*) at Mbeli Bai, northern Congo. *African Journal of Ecology*, 46: 110-112.

**NOWELL, A.A. & FLETCHER, A.W.** (2008) The development of feeding behaviour in wild western gorillas (*Gorilla gorilla gorilla*). *Behaviour*, 145, 171-193.

## Other journals:

**BREUER, T.** (2008) Club Ebobo – conservation education around the Nouabalé-Ndoki National Park. *Gorilla Journal*, 36: 18-20.

**BREUER, T.** (2008) Bais as a window into the life of wild western gorillas. *Anthropology News*, 4: 49

## Presentations:

**BREUER, T.** (2008) The Mbeli Bai Gorilla Study: 13 years of success in research, education and capacity building. Invited keynote speaker at the 6<sup>th</sup> gorilla workshop, Kissimmee, Florida, January 2008.

**BREUER, T.** (2008) Gorillas, elephants and other large mammals – 12.5 years of monitoring and conservation activities at the Mbeli Bai clearing in northern Congo. Barrows Conservation Lecture Series, Cincinnati, January 2008.



# COMMUNICATION & PUBLICATIONS

**BREUER, T., ROBBINS, M.M., & BOESCH, C. (2008)** Morphological factors affecting male reproductive success in gorillas., International Primatological Society XXII Congress, Edinburgh, August 2008.

**BREUER, T., ARANDJELOVIC, M., MAVINGA, F.B., BORCHERS, C., CAMPBELL, G., CIPPOLETTA, C., GOMES, G., HERBINGER, I., MASI, S. & RIEDEL, J. (2008)** Collaborative school education for great ape conservation – examples from Club Ebobo (Republic of Congo) and Club P.AN. (Ivory Coast). Conservation education forum, International Primatological Society Pre-Congress workshop, Edinburgh, July 2008.

CAMPBELL, G., ARANDJELOVIC, M., BORCHERS, C., **BREUER, T.**, GOMES, G., HERBINGER, I., MASI, S. & RIEDEL, J. (2008) Club Ebobo (Republic of Congo) and Club P.AN. (Ivory Coast): conservation education programs aimed at great ape and wildlife conservation. Poster presentation. Conservation education forum, International Primatological Society Pre-Congress workshop, Edinburgh, July 2008.

**BREUER, T. (2008)** The Mbeli Bai Study: insight into the life history, social organization and population dynamics of western gorillas. Invited speaker. UN conference on Biological Diversity, Bonn, May 2008.

**BREUER, T. (2008)** The Mbeli Bai Study: insight into the life history, social organization and population dynamics of western gorillas. Invited speaker. APE TAG, at meeting of EAZA, Frankfurt Zoo, April 2008.

Furthermore presentations were given during visits to Brevard Zoo, Busch Gardens, Disney Animal Kingdom, Toronto Zoo, Woodland Park Zoo and WCS/Bronx Zoo.

Additionally the MBS was featured in many different publications: Outpost magazine, Geo magazine Italy, Bradt Travel Guide, Illustreret Videnskab (Danish Science Journal), Animal AHA Academic Press and broadcasted in several German television series.

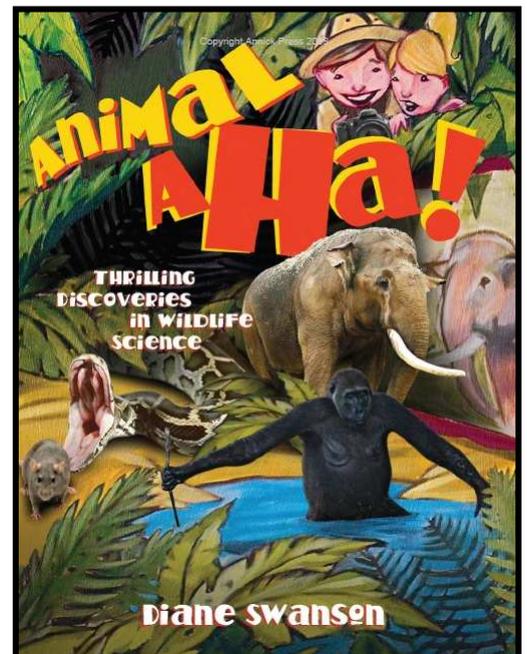
Interviews were given at:

Woodland Park Zoo

(<http://www.youtube.com/watch?v=BmWSzGKm54k>)

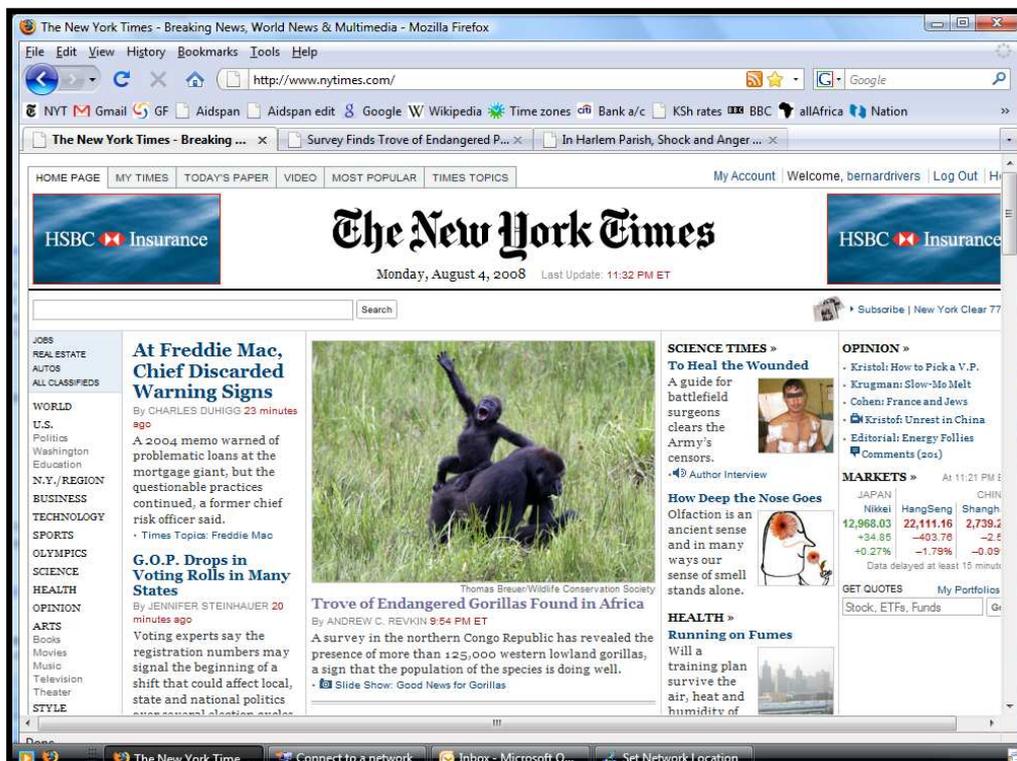
Public Radio Cincinnati

Swiss Radio DRS 2

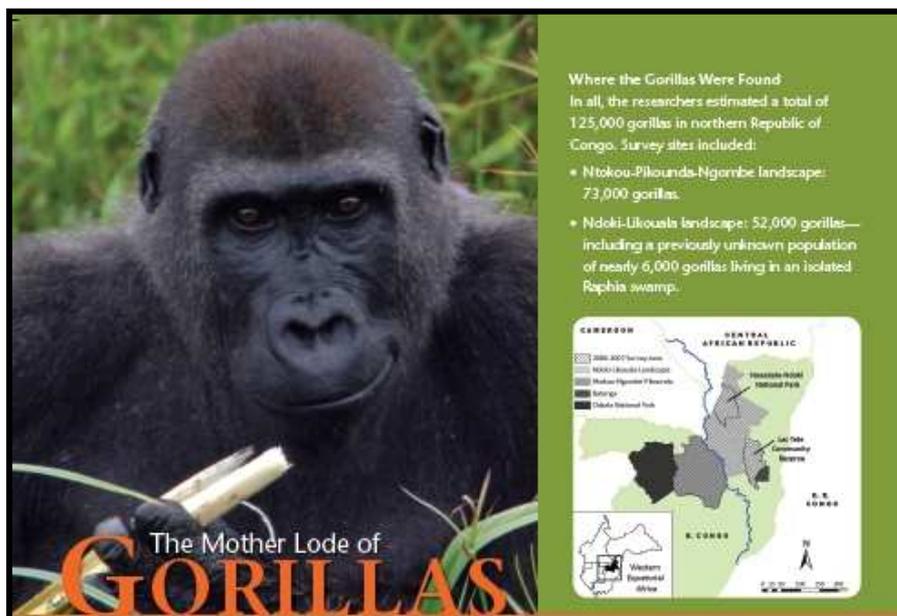


# COMMUNICATION & PUBLICATIONS

Providing journal photos for press releases:



Furthermore we are providing photographs and videos that will help to promote gorilla conservation. In 2008, our photos and videos have successfully been used in a press release about the discovery of 125,000 gorillas in northern Congo (see also (<http://www.wcs.org/gorilladiscovery/press-release>)).



(<http://www.youtube.com/watch?v=LMP1n3kTpa4>).

This encouraging news was covered on the front page of many newspapers, including the New York Times and by CNN, BBC, NBC

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