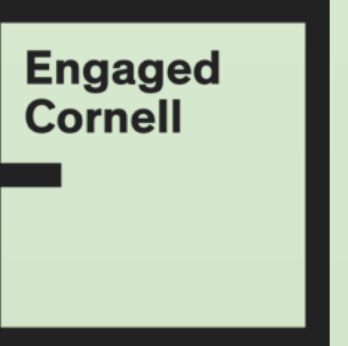


# Understanding the Environmental and Health Impacts on Semi-Captive Chimpanzees at Tchimpounga Chimpanzee Rehabilitation Center, Republic of the Congo



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## Abstract

As the Jane Goodall Institute prepares to reintroduce chimpanzees (*Pan troglodytes*) residing at the Tchimpounga Chimpanzee Rehabilitation Center (TCRC) into Conkuati-Douli National Park, it is imperative to evaluate the future success of each primate in the wild using routine health checks and non-invasive fecal analysis. It is also critical to identify optimal release sites within Conkuati-Douli National Park using camera trap footage. By ensuring this site has minimal impacts from deforestation and logging practices, it is possible to provide an ideal location for the survival of TCRC's chimpanzees.

### Our Project's Missions:

- Perform Health Checks on chimpanzees on the island of Tchibebe
- Understand the prevalence and impact of gastrointestinal parasite among chimpanzees on the islands of TCRC
- Install remote camera traps in TCRC and Conkuati-Douli National Park

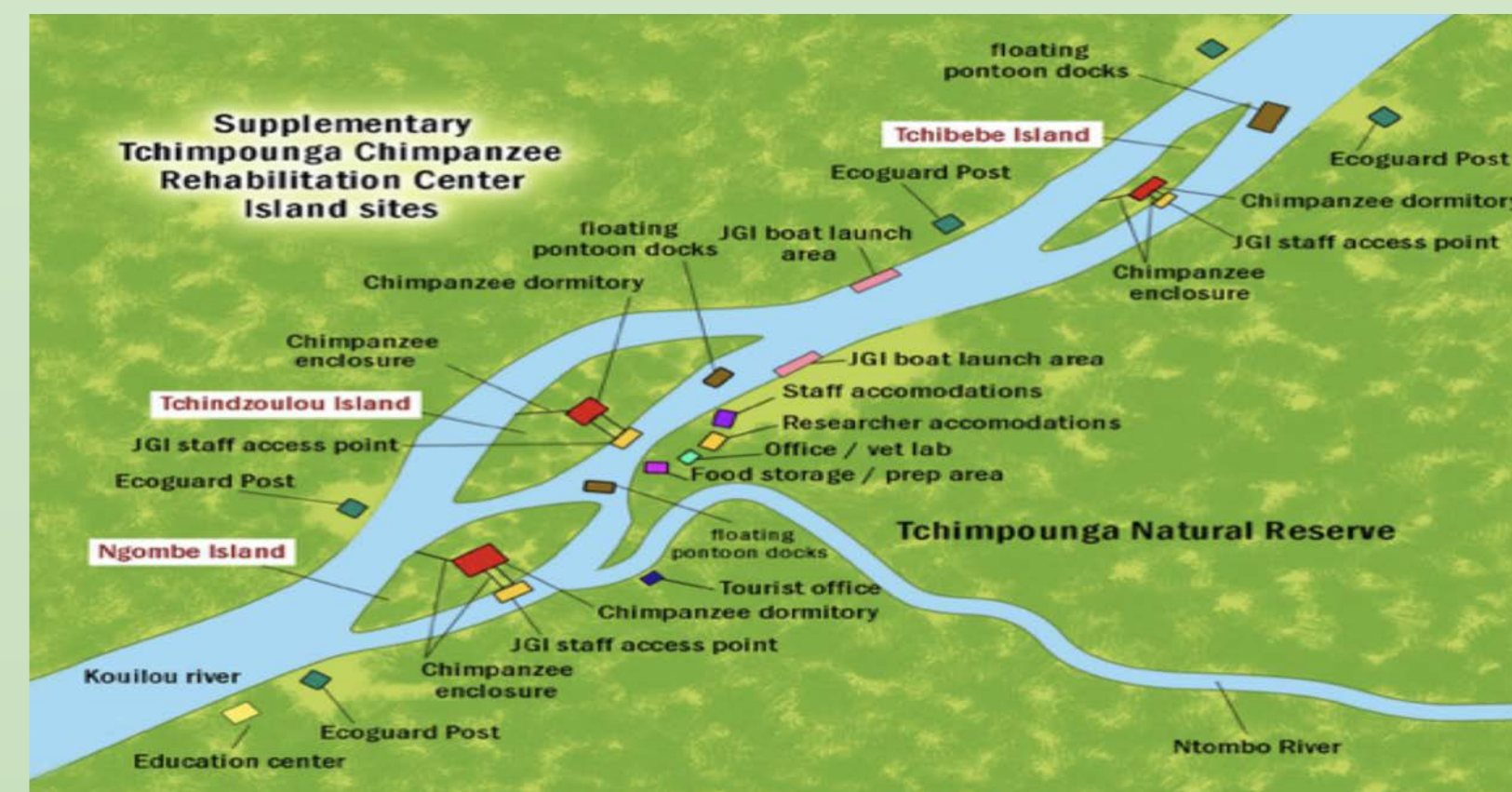
## Introduction

In 2008, the Jane Goodall Institute acquired three islands along the Kouilou River: Ngombe, Tchinzolou, and Tchibebe. By removing further contact from the human population, these islands provide templates of the wild environments the resident chimpanzees would soon encounter; encouraging its inhabitants to perfect naturalistic behaviors without the stresses of predators and survival. With ongoing efforts to non-invasively evaluate the health status of the resident chimpanzees and to identify appropriate release sites, JGI is preparing and perfecting the largest chimpanzee reintroduction to date.

Unfortunately, from January to March of 2019, the island of Tchibebe was flooded causing the island's twenty-seven resident chimpanzees to remain inside specialized dormitories, thus, limiting access to the surrounding forests. Given this, as well as the death of a high-ranking female chimpanzee, it was crucial to re-evaluate the health of these specific chimpanzees; to understand the impacts of stress and confinement had to their health.

## Acknowledgments

We would like to thank the Engaged Cornell and Expanding Horizon programs, Dr. Rebeca Atencia, the JGI staff, and Dr. Robin Radcliffe.



## Methods

### Health Check Procedures

Twenty-seven health checks were performed on the island of Tchibebe. Ketamine and Medetomidine were used as induction agents. Atipamezole was used as an alpha-2 antagonist/reversal agent. Supplemental oxygen was provided throughout the exam.

### Gastrointestinal Parasite Evaluations and its impact on Health

Seventy-two samples were collected from the islands of Ngombe, Tchinzolou, and Tchibebe. Each were analyzed with direct examination and fecal floatation using a sugar floatation medium. Prevalence was evaluated across islands. For ill chimpanzees, fecal results were evaluated over the course of their clinical signs and treatment.

### Remote Camera Trap Installation

Forty camera traps were installed in three locations: forests surrounding TCRC, Conkouati-Douli National Park, and on the sanctioned islands. Cameras were placed on wildlife trails in the vicinity of food and water sources. Each camera captured photos and videos of wildlife. Data will provide a general diversity and abundance surveillance as well as help identify individuals and their habitat range.



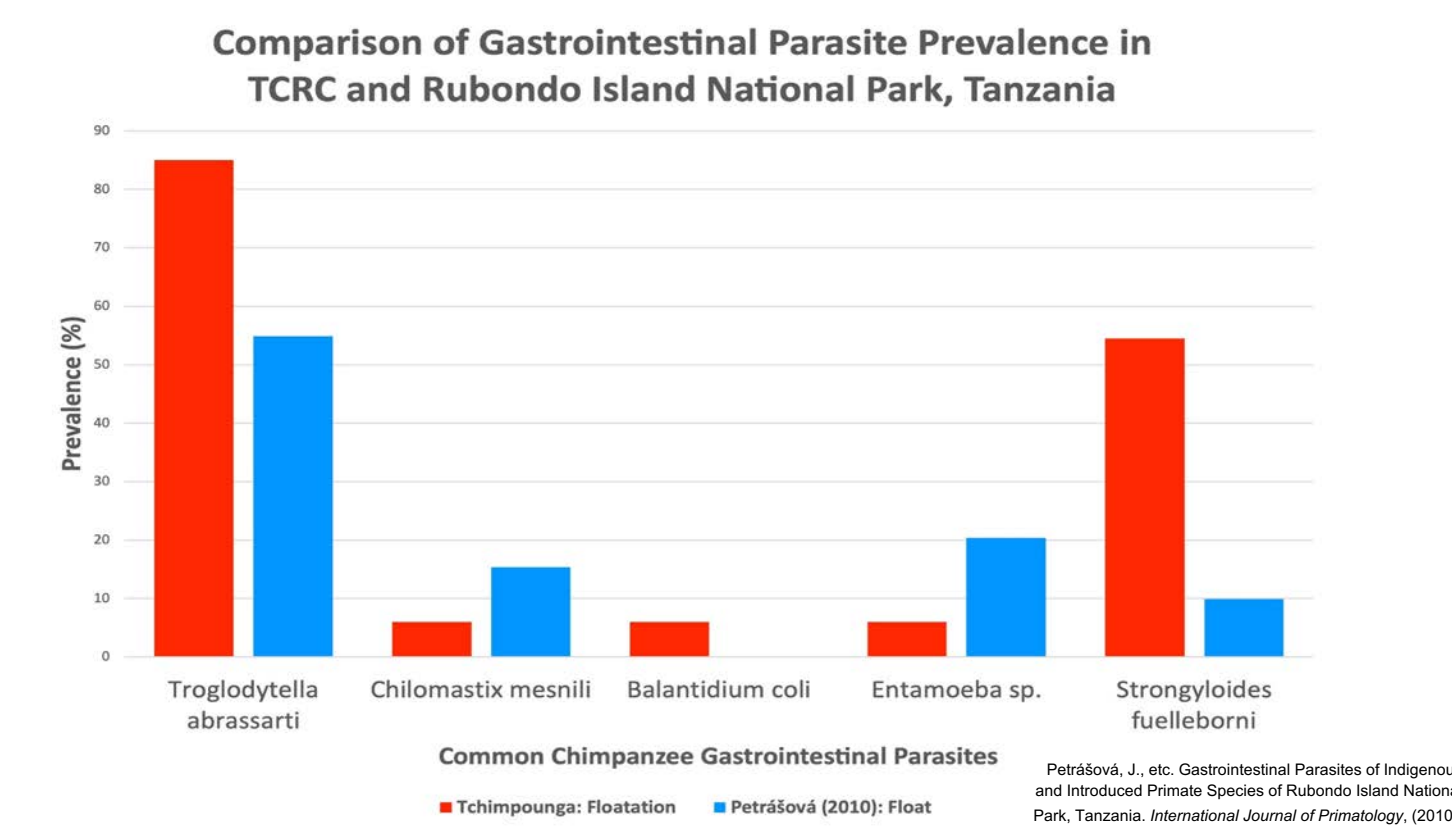
## Results

### Health Checks on Tchibebe

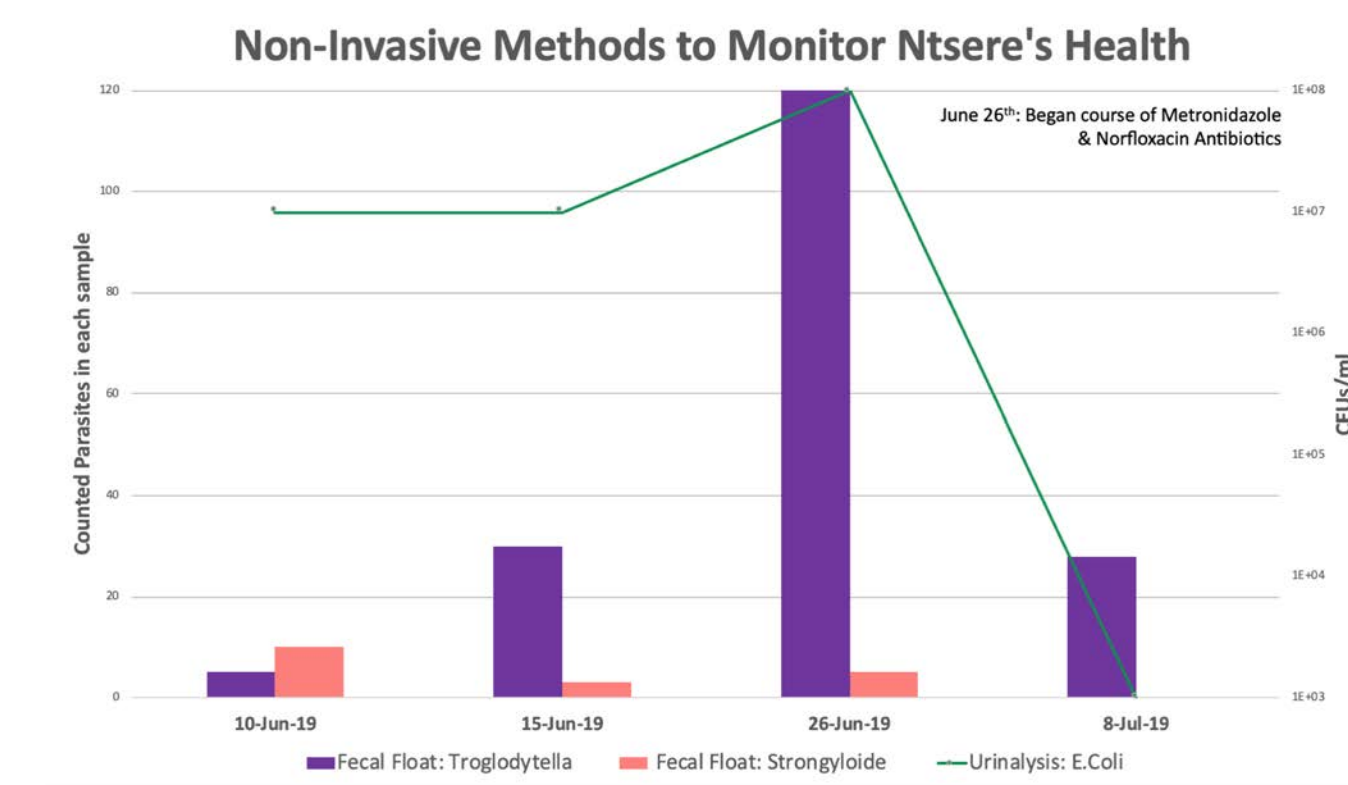
The following were performed during each procedure: PE, blood, urine and fecal collection, blood glucose and beta-ketone measurement, ECHO and ECG, morphometric measurements, and radiographs.

### Gastrointestinal Parasite Evaluation

Fecal parasites were identified using morphological features. The quantity of each parasite was recorded and the prevalence of each species was calculated. In the figure below, the prevalences observed in the TCRC was compared to prevalences recorded by Petrášová (2010).



A high ranking male on the island of Ngombe, Nstere, became ill and was diagnosed with a urinary tract infection. Fecal and urine samples were collected throughout his illness; fecal analysis was performed in-house while urine analysis and bacterial cultures were performed at a biomedical laboratory in Pointe Noire. The figure below charts Nstere's progression. On June 26th, he was given a course of antibiotics. Shortly after, Nstere began showing signs of improvement.



### Remote Camera Trap Project

Preliminary information has shown images and videos of elephants, gorillas, and hunters in the Conkouati-Douli National Park. Data collection and analysis still needs to occur, identifying the diversity of wildlife and abundance of chimpanzees in TCRC.



## Conclusions

With Dr. Rebeca Atencia, Executive Director of JGI in TCRC, twenty seven health checks were completed. Implementation of ECHO and ECGs in health checks will help elucidate the presence and progressions of cardiovascular diseases in great apes (*Great Ape Health Project*).

The prevalences of the ciliate protozoan *Troglodytella abrossarti* and *Balantidium coli*, and the nematode *Strongyloides fuelleborni* were higher in TCRC than in Petrášová's study, and prevalences of the enteric flagellate protozoa *Chilomastix mesnili* and amoeba *Entamoeba sp.* were lower. While only comparing to one previous study, this information highlights the effects environment has on chimpanzee health.

Fecal floatations and urinary bacterial cultures allowed us to track Nstere's health over time. Both *Troglodytella abrossarti* numbers and *Escherichia coli* colony forming units (CFU) dropped significantly following antibiotic treatment. The ability to use these non-invasive diagnostics as markers for animal health is fundamental in sanctuaries to provide quality care to animals with minimal human contact.

Forty camera traps were successfully installed. While preliminary results have not been collected, they hope to showcase wildlife diversity in Conkouati-Douli National Park as well as the abundance of chimpanzees surrounding TCRC. Concurrently, it also offers context on the suitability of the habitat where the sanctuary's chimpanzees will be released and the validity of future reintroduction projects.

## Sustainability

### Multifactorial evaluation strategies of Chimpanzee Health

Along with routine health checks, the Jane Goodall Institute will continue to institute our research projects in an effort to further assess the health of their chimpanzees prior to reintroduction into the wild.

### Remote Camera Trap Project

Gathering and analyzing the footage and data from the camera traps will help provide necessary information of the diversity of wildlife and potential threats in which the released chimpanzees will face. This effort will support the necessity for future land protection as a means for chimpanzee conservation.