

Final report on the Tang Prize Grant

Laureate: Dr. Jane Goodall, the 2020 Tang Prize

Executing Organization: Instituto Jane Goodall España (the Jane Goodall Institute in Spain, operating in Senegal)

Grant Proposal Title: Wild chimpanzee (*Pan troglodytes verus*) conservation and research in south-east Senegal

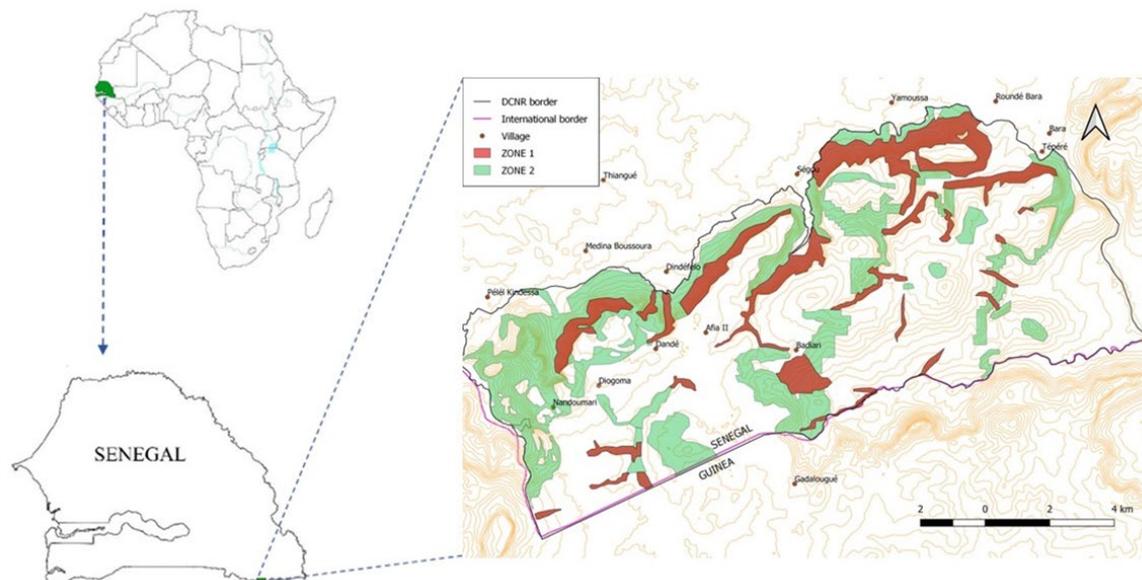
Term of the Project: 2 years



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Background

The western chimpanzee (*Pan troglodytes verus*) is listed as a Critically Endangered subspecies on the IUCN Red List (Humble et al. 2016). There are between 35,000 to 55,000 individuals in the wild (Külh et al. 2017), with fewer than 500 in Senegal (Pruetz et al. 2002; Carter et al. 2003). Between 1990 and 2014, the western chimpanzee population suffered a reduction of 80% and it is estimated that 99% of the remaining population will be lost by 2060 if this decline continues (Külh et al. 2017). This critical situation makes the western chimpanzee one of the world's 25 most endangered primates for the 2018-2020 period (Schwitzer et al. 2019). The primary threats to western chimpanzees are habitat loss and illegal hunting (Kormos et al. 2003). In Senegal, where the savanna woodland habitat is especially vulnerable due to aridity and environmental change, the main threats are habitat loss and fragmentation caused by human activities such as deforestation, agriculture and mining (Külh et al. 2017).



Location of the Dindéfelo Community Nature Reserve in Senegal, and its areas with higher protection (zone 1 and 2)

The main objective of the JGI Spain in Senegal (JGIS) is to contribute to the conservation of the western chimpanzee in Senegal and Guinea. The Dindéfelo Biological Station (DBS) is located in the remote and rural **region of Kedougou** in southeast Senegal, and it is the base for the work developed by JGIS in and around the Dindéfelo Community Nature Reserve (DCNR), including the north of Guinea. The DCNR is part of a World Heritage Site (WHS) by UNESCO [the “Bassari Country: Bassari, Fula and Bedik cultural Landscape” (ref:1407)] and was declared Important Bird and Biodiversity Area (IBA) by BirdLife International in 2014. The JGIS helped to create the DCNR in 2010 and has provided technical assistance, training, and communications and logistic support for its management.



View of the Dindéfelo Community Nature Reserve (DCNR) (left) and a female chimpanzee named Hiila in the DCNR (right).

Since 2009, the JGIS has monitored the chimpanzees in the DCNR and since 2012 in Sabe, northern Guinea. In 2022, JGIS started chimpanzee monitoring in two more communes around Dindéfelo in Senegal: Dakately and Fongolimbi. This biomonitoring program consists of collecting data on the distribution and behavioral ecology of chimpanzees, as well as on the presence of other fauna. The JGIS also monitors human activities in order to assess threats to chimpanzees and their habitat. The collected data not only contribute to our knowledge of the ecology, behavior and culture of the western chimpanzees, but also guide the JGIS team to make more adequate conservation decisions to protect the chimpanzees and their habitat and to mitigate negative interactions between humans and chimpanzees in this landscape of coexistence.



The DCNR, declared “IBA” by Birdlife International



JGI's Dindéfelo Biological Station



View from the DCNR plateau



A typical hut within the DCNR

Following a holistic approach, the JGIS also carries out conservation and agroforestry projects, including reforestation of chimpanzee corridors, creation of buffer zones, creation of firebreaks to protect chimpanzee habitat, distribution of fruit trees and seeds among the local population, and other food security initiative and trainings. Besides, the JGIS is carrying out a project to promote food security and build community resilience to climate change in 21 villages of 4 communes, targeting mainly women in cooperatives and providing training and equipment, as well as community sensitisation on equality of gender and sustainable management of natural resources.



View of the 'plateau', in the highest point of the reserve (left) and a JGIS field assistant collecting chimpanzee tools in a termite mound (right)



Tree nursery at JGI's Dindéfelo Biological Station (left) and distribution of seeds and fruit trees in villages (middle and right)

Tang Prize Foundation donation financed the implementation of ecological and ethological monitoring of chimpanzees in the DCNR, including data collection via android devices and camera traps, in a two-year period starting in 2021. We would like to express our most sincere gratitude to the Tang Prize Foundation for its valuable support to the JGI mission in Senegal.

Project objective

Implementation of ecological and ethological monitoring of chimpanzees in the DCNR, including data collection via android devices and camera traps, in a two-year period starting in 2021.

Expected Results

1. Ecological and ethological data on chimpanzees collected monthly on android devices by field assistants in the DCNR and analyzed
2. Images of chimpanzees and other fauna recorded monthly by camera traps in the DCNR and analyzed

Description of the activities conducted during the grant term

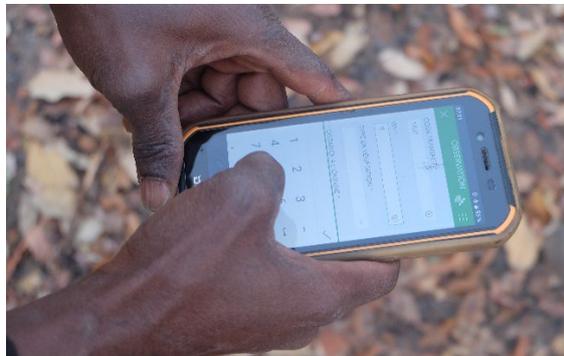
1) Biomonitoring of chimpanzees by field assistants

The main objective of this biomonitoring program is to better understand the distribution and behavioral ecology of chimpanzees. Also, this activity allows us to gain knowledge on other mammal species and to assess anthropogenic threats in the reserve.

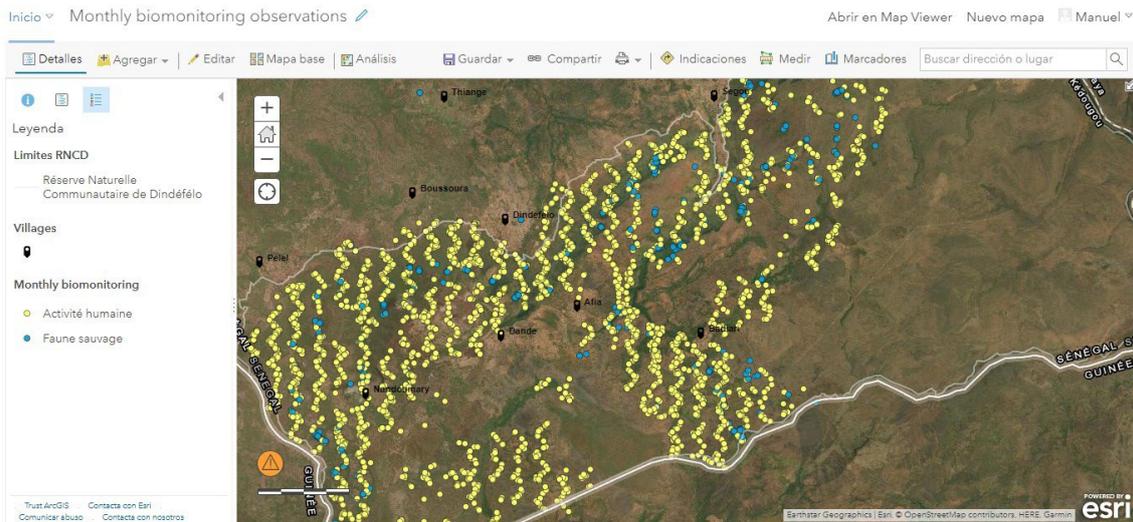
The JGI field assistants patrol the DNCR to:

- 1) collect indirect evidence of chimpanzee behavior (nests, feces, feeding remnants and tool use) and conduct direct observations when possible
- 2) obtain data on the presence of other fauna, including primate species
- 3) monitor human activities

To collect such data, it is necessary to employ several teams of field assistants to patrol the DNCR on a regular basis, using Android devices programmed up to some time ago with Cybertracker, in order to later download the data at the JGI Biological Station into the Spatial Monitoring and Reporting Tool (SMART) program. One of the improvements during the term of this grant has been the gradual **introduction of ArcGis Survey 123** for evidence gathering, with specific field staff training and the programming of the survey by our JGI research technical assistant. In this way, the recorded data is automatically uploaded to the Cloud and in near real time the JGI research co-directors and coordinator can view the data and images obtained in the field. These data are analyzed and mapped and are reported to the authorities (Direction des Eaux, Forêts, Chasses et de la Conservation des Sols) on a regular basis.



JGI field assistants collecting data on bushfire (left) and Android device programmed with ArcGIS survey 123 (right)



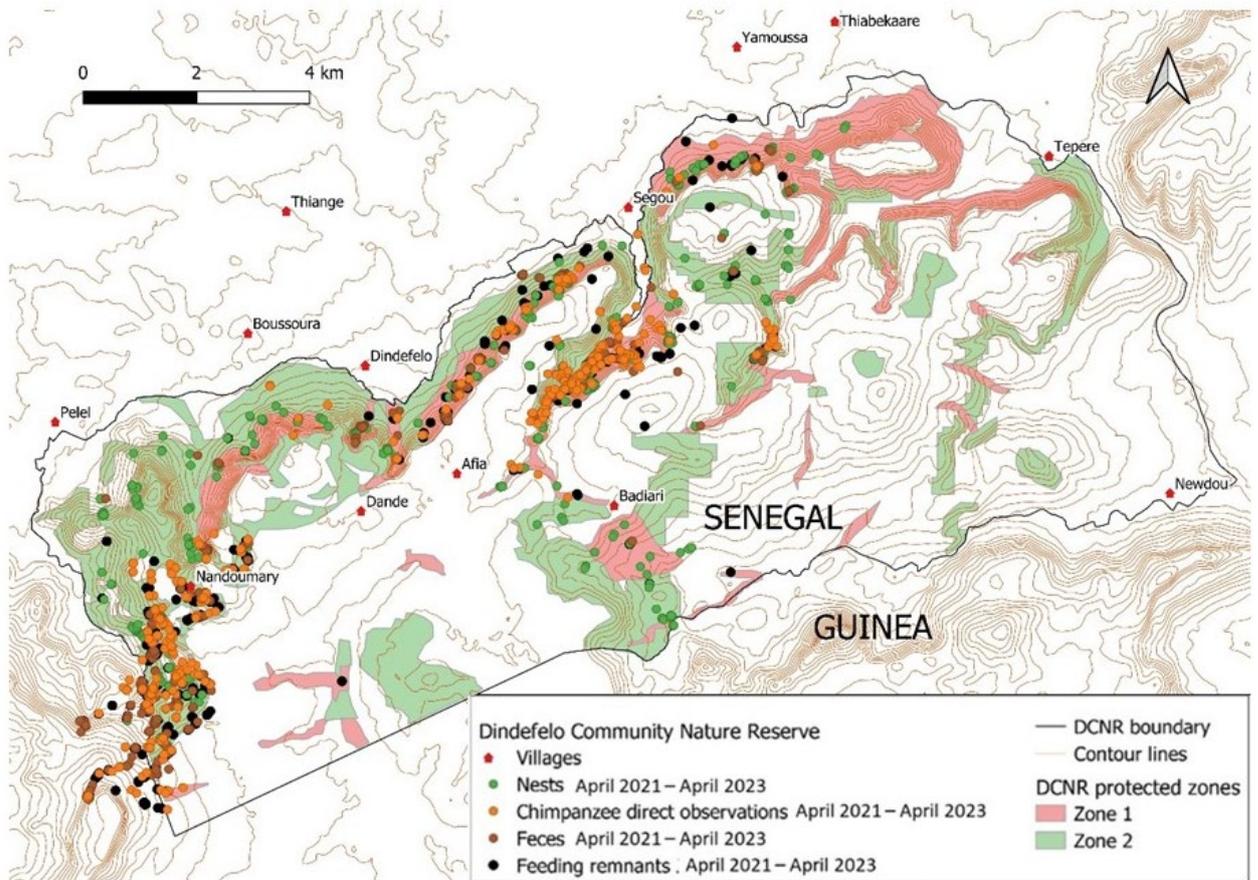
Screenshot from ArcGIS Survey 123, with data recorded monthly by the team in the field showing chimpanzee presence (blue dots) and human activities (yellow dots)

Another improvement implemented in 2022 has been the expansion of **the monitored area** of the reserve and the reduction of the time spent directly observing chimpanzees, focusing more of the sampling effort on indirect evidence and thus reducing the risk of chimpanzee habituation to humans. In this way we have also regularly covered more remote areas and found the presence of chimpanzees at points near the Guinean border, thus detecting potential ecological corridors between the two countries that are currently used by chimpanzees.

In summary, in the term of this grant (April 2021-April 2023) JGI field teams walked **13,984 km** during biomonitoring, with a total of 9,876 hours in the field. A total of **709 direct observations** of chimpanzees were recorded using SMART and ArcGIS Survey 123 software. A total of **2,157 - records of indirect evidence** of chimpanzee behavior was also collected (nests, feces and feeding remnants) to obtain data on diet and vegetation species used for nesting.



Chimpanzee footprint (left) and baobab fruits eaten by chimpanzees (right)

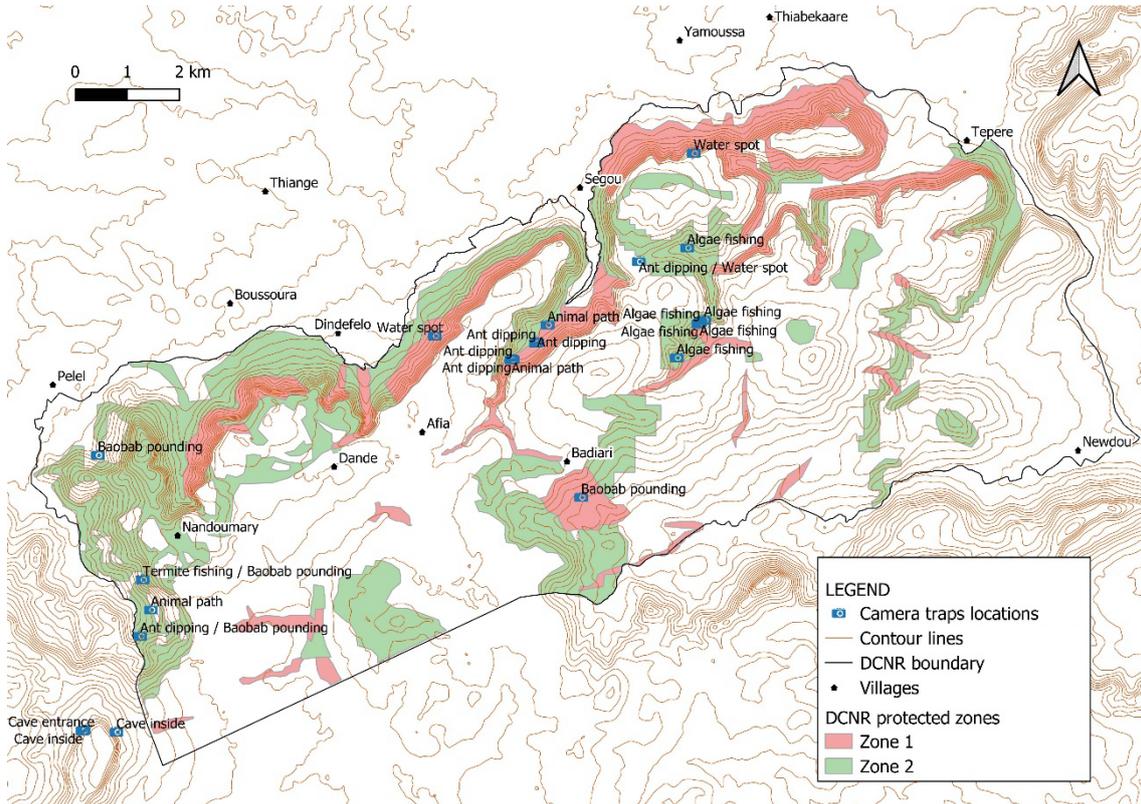


Indirect evidence and direct observations of chimpanzee behavior recorded in the DCNR between April 2021 and April 2023

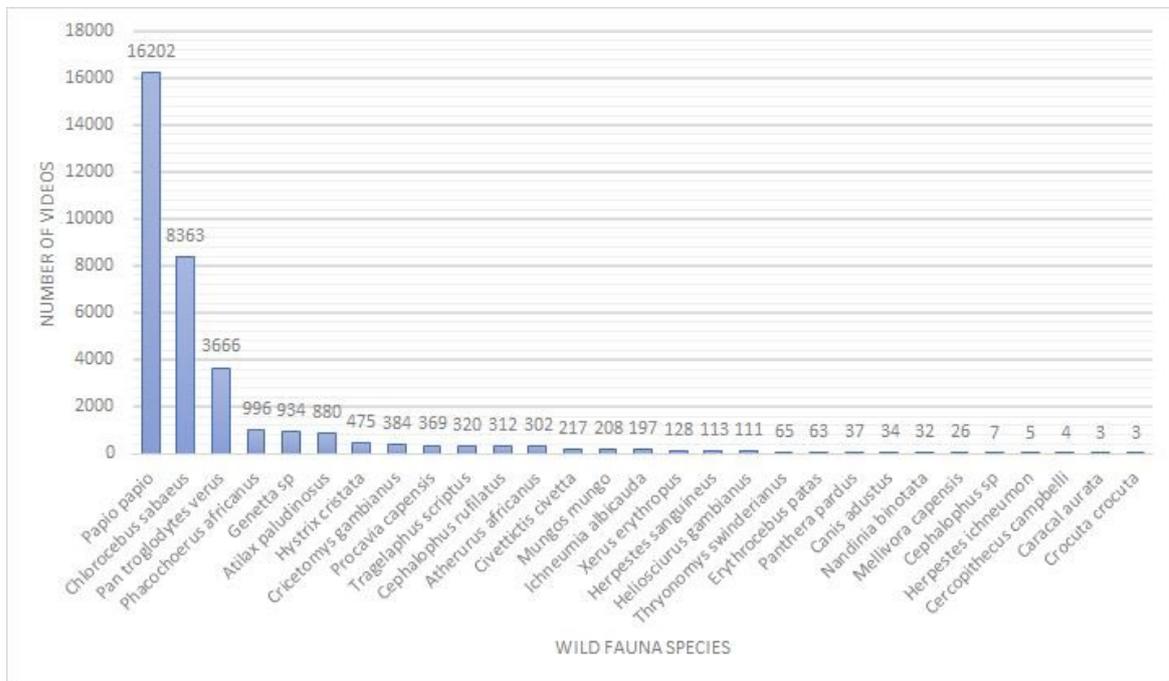
2) Camera trap monitoring

Between April 2021 and April 2023, JGI camera traps continued to provide valuable ecological and ethological information on chimpanzees, other fauna and on human activity in the DCNR and surrounding area, complementing data obtained with ArcGIS Survey123.

In the term of this grant, 25 camera traps were placed in the reserve and a total of **71,278 videos** were recorded by camera traps in the Dindéfelo Reserve (DCNR) and in caves across the border in Guinea. Of those, **4,419 videos recorded chimpanzees and 42,986 other wildlife**. The rest of the videos recorded human activities (such as hunters and livestock grazing). The presence of hunters and other prohibited activities in the reserve that were captured by the camera traps were reported to the authorities.



Camera trap locations in the DCNR from April 2021 to April 2023



Number of videos recorded for each species of mammal identified on camera trap videos from April 2021 to April 2023 in the DCNR



31C 05/15/2021 12:15PM CAMERA1

Male chimpanzee inside a cave (May 2021)



CORE Cam 69°F 20°C 12/03/2022 07:15:06

Male chimpanzee in the DCNR (December 2022)



CORE Cam 86°F 30°C 02/13/2023 12:56:44

Two chimpanzees in a gallery forest in the DCNR (February 2023)



27C 04/15/2021 07:25PM CAMERA1
An individual of leopard (Panthera pardus) in a cave (April 2021)



15C 01/26/2022 06:13AM CAMERA1
An individual of spotted hyena (Crocuta crocuta) in the DCNR (January 2022)



Bushnell CORE Cam0 82°F 27°C 12/10/2022 12:53:28
Individual of red-flanked duiker (Cephalophus rufilatus) in the DCNR (December 2022)

Camera traps continue to give us crucial information about **illegal human activities** within the DCNR, for example, the presence of hunters in one of the most important zones for chimpanzees during the algae fishing period, also used as a corridor (images below). Note the interval of time (27 minutes) between the hunter and a female chimpanzee and her infant presence.



Building local technical capacity

One of the objectives of the JGIS is the training of local personnel in new technologies in the hope of continuing to build this individual's skills in science and scientific methodologies. In 2021, we recruited a Senegalese woman from Dindéfelo and mother of two, Aïssatou Sy. She was trained in computer use, video viewing and coding from camera traps. Before this training, Aïssatou did not know how to use a computer and had no previous experience in camera trapping, but her willingness to learn made her the ideal candidate to be trained in the coding of camera trap videos. For instance, in 2022, Aïssatou coded 8,709 videos, being fully autonomous and able to use Excel and identify the different species of mammals and chimpanzee behaviors shown in the images. In addition, Aïssatou also participated in field work, learning how to use GPS and ArcGIS Survey 123 to collect data.

In 2022, we trained the JGI field assistants in the use of ArcGIS Survey 123 for field data collection and in the new sampling methodology that requires the use of GPS and the aforementioned software.



Aïssatou Sy coding camera trap videos at the JGI's Dindéfelo Biological Station (left) and installing a camera trap in the DCNR (right)

Research and Conservation outcomes and impact

Three international primatology meetings were held in 2022, in which the JGIS participated by presenting some of its work. The first meeting was the **XXVIII International Primatological Society and the American Society of Primatologists Conference**, which took place in Quito (Ecuador) in January 2022. The second, the **Conference of the European Federation for Primatology and the Gesellschaft fuer Primatology**, was held in Arnhem (Netherlands) in June 2022. And the third one was the **VIII Iberian Primatological Conference**, held in Barcelona (Spain) in October 2022. A total of seven oral communications and posters were presented.

In addition to these meetings, the JGIS was invited to participate in the **IUCN Regional Workshop on the Biomonitoring of Western Chimpanzees**, held in Monrovia (Liberia) in October 2022. The workshop aimed to identify data gaps and plan for their elimination within a regional biomonitoring scheme to assess western chimpanzee status and distribution. A holistic framework for data collection was discussed and defined, and participants became familiar with the A.P.E.S. database.

During the three-day workshop, the JGIS Field manager and the other participants discussed the biomonitoring approach to be implemented in the region and the monitoring objectives relevant to the actions identified in the Western Chimpanzee Conservation Action Plan 2020-2030 (WCAP). The conclusions drawn from the workshop are relevant to working together across sectors to define monitoring approaches to assess the true status and distribution of chimpanzees in West Africa, with the aim of ensuring the long-term survival of this critically endangered subspecies.



Participants of the Regional Workshop on the Bionitoring of Western Chimpanzees in Monrovia, October 2022

The data collected every year also guide the JGIS team in Senegal to make more adequate conservation decisions to protect the chimpanzees and their habitat, and to mitigate negative interactions between humans and chimpanzees in this landscape of coexistence. The JGIS carries out sustainable development and environmental sensitisation projects with the local human community to help them to manage their natural resources better, and to protect the habitat of this critically-endangered chimpanzee subspecies. These projects include reforestation, agroforestry, food security (fonio, moringa, etc.), living fences, bush-fire prevention and control, sensitisations and biocharboal making.

Finally, it is very important to highlight the impact JGIS projects make by creating direct and indirect jobs in this economically vulnerable zone, and by helping to mitigate climate change through reforestation and other initiatives promoting the sustainable management of natural resources.

100% of the funds provided by the Tang Prize Foundation (72,000€) were used to help achieve these goals during this 2-year term, following the table of direct costs agreed upon in the MoU. Please see the final balance sheet reviewed and approved by the JGIS accounting departement (Annex I, in page 15 of this document).

We would like to thank Tang Prize Foundation for its economic support to the JGI mission.

Laia Dotras
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Animal welfare and ethics

The JGIS activities have the endorsement of the Direction des Eaux, Forêts, Chasses et de la Conservation des Sols (DEFCCS) in Senegal and the research work complies with the guidelines of the International Primatology Society Codes of Best Practices for Field Primatology. The JGIS work is non-invasive and does not directly involve research on any animal subjects. The chimpanzees and other mammal species will just be observed and photographed or video-recorded. In case of finding an animal in bad condition due to an external force or due to human illegal activity, the case will be immediately reported to the local authorities.

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Final balance sheet on the Tang Prize Grant

Wild chimpanzee conservation and research in south-east Senegal Financial Report 1 April 2021 – 1 April 2023

At the end of the project the total Tang Prize funding has been expended and distributed as follows:

| Direct costs | Year 1 | Year 2 | Total Amount |
|---------------------------|-------------|-------------------|--------------------|
| Personnel & insurance | 34 036,99 € | 28 873,57 € | 62 910,56 € |
| Transport & logistics | 1 423,83 € | 598,32 € | 2 022,15 € |
| Local accomodation & food | 1 168,95 € | 232,02 € | 1 400,97 € |
| Equipment & supplies | 2 155,30 € | 3 511,16 € | 5 666,46 € |
| | | Total Cost | 72 000,14 € |




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