



# MACACA NIGRA PROJECT



## ANNUAL REPORT 2021

TANGKOKO NATURE RESERVE



UNIVERSITÄT  
LEIPZIG



UNIVERSITY OF  
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## DEAR FRIENDS AND SUPPORTERS

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This year again has been a challenging one, with the SARS-CoV-2 pandemic still raging on and drastically limiting our activities and movements, especially those involving large numbers of people. But like last year, we adapted our programs, and we had a few rays of sunshine. Read on to find out what we did achieve! And happy birthdays to both the Macaca Nigra Project (MNP) and Tangkoko Conservation Education (TCE)!



A female crested macaque napping on the forest floor



## HIGHLIGHTS

This year, MNP celebrated 15 years of existence! For this occasion, we launched a Special Issue in the [International Journal of Primatology](#) to showcase the very important research, conservation, and education projects MNP has been involved in during all these years. We are planning to have the special issue published in 2022. Long-term field projects are essential not only for the understanding of the ecology and biology of species but also for their protection, in particular in the case of the extremely endangered crested macaques! With this special issue, we will take stock of the demographical changes of the studied groups and the ecological evolution of their environment over the last 10 to 15 years.

MNP education initiative, TCE, also celebrated an important milestone, a full 10 years of program! Over these many years, TCE has been involved in 23 schools in 12 towns/villages, targeting about 4,000 pupils in total and 60 school teachers! Since 2011, 34 awareness campaigns for local communities about nature conservation and biodiversity

have been carried out. In 2014, a Memorandum of Understanding was signed with the Education Department of Bitung city, the regional sub-capital, encouraging schools to include TCE's environmental lessons into their curriculum. Furthermore, more than 50 local teachers were trained in delivering these lessons and since 2016, 4 schools have already integrated them into their teaching. Finally, since 2020, a Science Camp, a week of immersive research and conservation training at the MNP research station, is organised for 10 high-school students, with the hope that they will continue caring for and protecting their natural heritage.

We are also very proud to report that in April 2021, MNP and PKT staff received an honour from BKSDA to thank them for their work towards conservation of natural resources in Tangkoko! We will continue our efforts to protect the crested macaques, further our knowledge about their biology and behaviour and share what we find out with everyone.

“LONG-TERM FIELD PROJECTS ARE  
ESSENTIAL, NOT ONLY FOR THE UN-  
DERSTANDING OF THE ECOLOGY OF  
AND BIOLOGY OF THE SPECIES BUT  
ALSO FOR  
THEIR PROTECTION”



MNP and TCE staff after receiving their award from BKSDA





## STAFF CORNER

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One in one out...Mid-year, we welcomed Randika Joseik-nasio Baweleng as a new attendant for the field station. At the end of the year, we said good-bye to Casa Kanaug, a field assistant with MNP since end of 2019 and a previous volunteer with TCE. Good luck in your future endeavours Casa!



## RESEARCH CONDUCTED

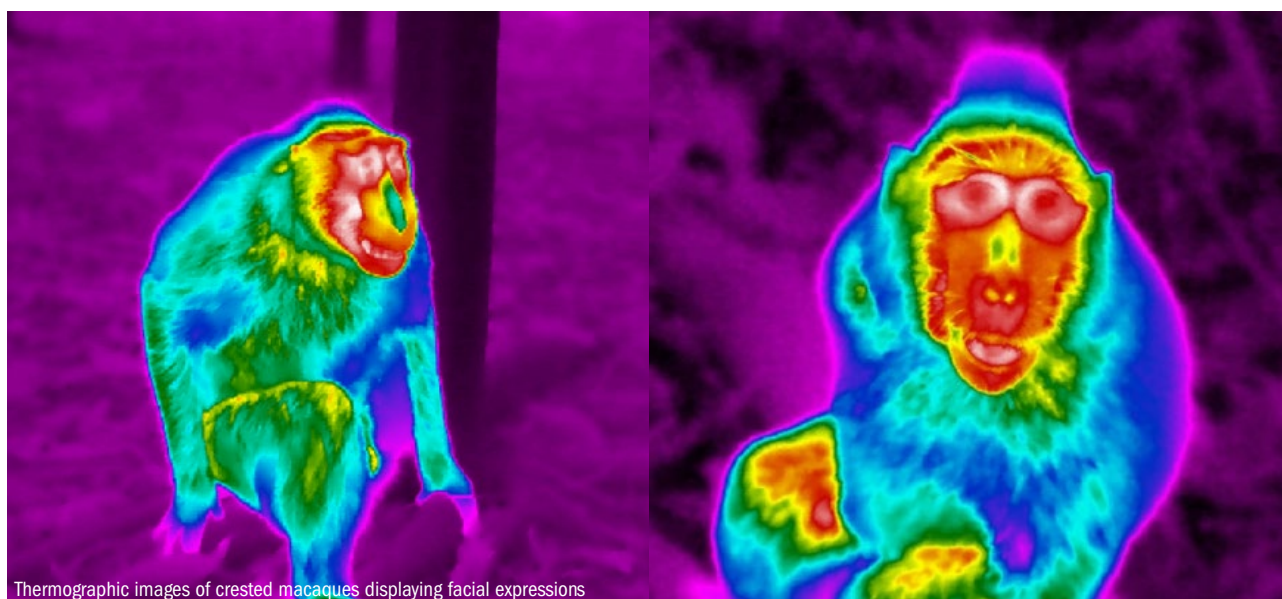
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Aside from the continuous collection of demography, reproduction, phenology, and climate data for the project on a near daily basis, the following specific projects have been or are being carried out in 2021:

### **The role of emotions in the communication system of wild crested macaques, Juliette Berthier**

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Starting in the end of 2019, Juliette Berthier, PhD student at the University of Kent, England, carried on collecting data for her project on “The role of emotions in the communication system of wild crested macaques (*Macaca nigra*) - A new approach using infrared thermography”. Her project finished in December 2020. Juliette collected data on individuals from two study groups (PB1B: 11 adult males, 20 adult females; R1: 11 adult males, 41 adult females at this time), notably social data to calculate the strength of social relationship between adult females and to establish the hierarchy among males and females. In parallel, she recorded the vocalisations (affiliative grunts, contact calls and screams) of adult females to create playbacks needed for field experiments. The playbacks and stimuli (fake predators and other object) presentation experiments she carried out in different contexts (predation, aggression, affiliation) will help determine the role of emotion in primate communication.



### **Genetic diversity of crested macaques' populations, Eleonora Neugebauer**

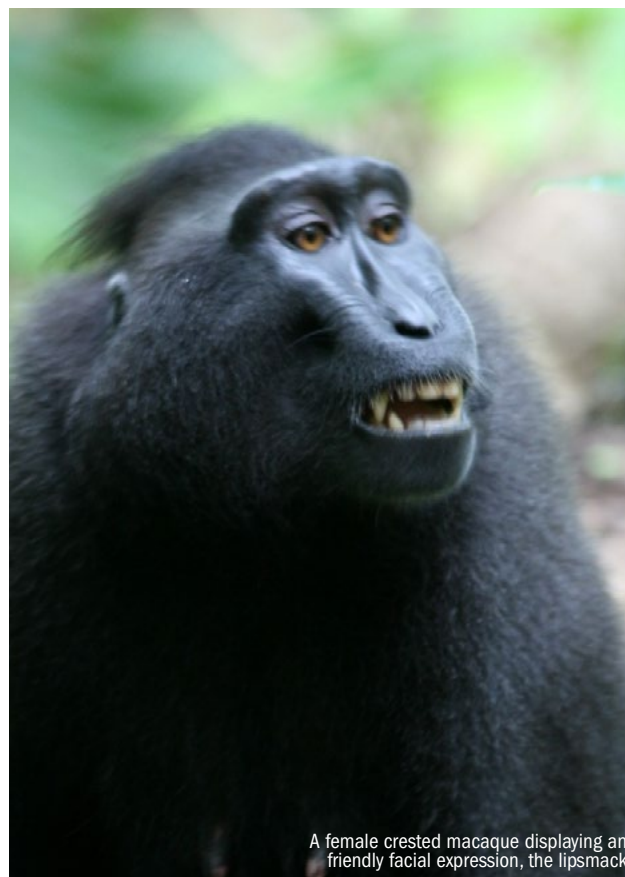
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Eleonora Neugebauer, a PhD student at Leipzig University, Germany, who started her project in 2020, also continued data collection in 2021. This year, she focuses on assessing the genetic diversity of remaining populations of crested macaques, threatened with extinction due to habitat loss and hunting, across North Sulawesi and an introduced population in Bacan, north and outside of their native range. She collects noninvasively fecal samples of crested macaques in order to carry out DNA analysis and determine the genetic variability of the different populations.

## NetFACS, using network science to examine facial expressions, Jérôme Micheletta

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Co-director Jérôme Micheletta and colleagues are carrying out a project called NetFACS, which aims at combining the Facial Action Coding System (an anatomically-based system designed to break-down facial expressions into their most basic observable units, the contraction of individual facial muscles) with Social Network Analysis (a method to measure relationships between units in a system) to develop a novel framework to study communication via the face. They have developed a first version of the NetFACS package, published in Behavioral Research (Mielke et al 2021, see below for full reference). Unfortunately, data collection on crested macaques, which was planned in Tangkoko, has been cancelled due to unplanned changes in personnel and the Covid pandemic. Existing data collected by University of Portsmouth PhD candidate Peter Clark in 2019 will be used instead (Clark et al. 2020 Morphological variants of silent bared-teeth displays have different social interaction outcomes in crested macaques (*Macaca nigra*). American Journal of Physical Anthropology, 173(3), 411-422).



A female crested macaque displaying an friendly facial expression, the lipsmack

## Macaca nigra in the spotlight: accounting for diversity in behaviour, ecology and conservation in primates.

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Finally, as mentioned in the highlights, co-directors Jérôme Micheletta and Julie Duboscq, together with Guest Editors Jana Supriatna and Martina Langi, have launched a Special Issue in the International Journal of Primatology “Macaca nigra in the spotlight: accounting for diversity in behaviour, ecology and conservation in primates” to celebrate the 15 years of existence of the Macaca Nigra Project. The special issue will gather up to 18 contributions from 46 authors from across the world, and cover diverse topics in reproductive biology, social behaviour, socio-ecology and conservation-education, studied by the different researchers and students over the years. We aim to get the special issue published in September 2022.



# PUBLICATIONS

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## Scientific peer-reviewed articles

Mielke, A., Waller, B. M., Pérez, C., Rincon, A. V., Duboscq, J., & Micheletta, J. (2021). NetFACS: Using network science to understand facial communication systems. *Behavior Research Methods*, 1-16. <https://doi.org/10.3758/s13428-021-01692-5>

Martínez-Íñigo, L., Engelhardt, A., Agil, M., Pilot, M., & Majolo, B. (2021). Intergroup lethal gang attacks in wild crested macaques, *Macaca nigra*. *Animal Behaviour*, 180, 81-91. <https://doi.org/10.1016/j.anbehav.2021.08.002>

Sadoughi, B., Girard-Buttoz, C., Engelhardt, A., Heistermann, M., & Ostner, J. (2021). Non-invasive assessment of metabolic responses to food restriction using urinary triiodothyronine and cortisol measurement in macaques. *General and Comparative Endocrinology*, 306, 113736. <https://doi.org/10.1016/j.ygcen.2021.113736>

Higham, J. P., Heistermann, M., Agil, M., Perwitasari-Farajallah, D., Widdig, A., & Engelhardt, A. (2021). Female fertile phase synchrony, and male mating and reproductive skew, in the crested macaque. *Scientific reports*, 11(1), 1-11. <https://doi.org/10.1038/s41598-021-81163-1>

A group of macaques resting on the forest floor





# CONSERVATION

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## Human-wildlife interactions

With partner NGO Selamatkan Yaki, we continue our human-wildlife interaction mitigation actions, funded by the ASAP-RAF (Asian Species Action Partnership – Rapid Action Fund) Initiative. This activity includes one ranger patrol per month, 2 teams of 6 people patrolling the Tangkoko area over 2 days, and 5 focus-group discussions and small public social events in 5 towns settled around the Tangkoko Reserve. Together with BKSDA, the local conservation agency, we trained 60 people (villagers, volunteers from local NGOs, ect) in patrolling skills (data collection and environmental survey technics). In 2021, patrols took place in February and April 2021 and two in May 2021. Unfortunately, in May 2021, several factors, mainly the on-going Covid-19 pandemic leading to local conservation agency management disruption, forced us to stop our main activities. Therefore, the project was extended until April 2022. The situation has thankfully finally stabilised in the past couple of weeks and restrictions are now easing, so hopefully, we will be able to continue with the planned activities.

Our conservation officer has patrolled the reserve border with the Batu Putih town 264 days out of 365 and recorded at least 751 instances of monkeys ranging outside the reserve and inside yards, gardens or other areas frequented by humans. A formal complaint has been lodged with the BKSDA and the President of the Republic of Indonesia by representatives of people living in Batu Putih concerning the lack of preventive and offensive actions taken by the authorities to protect humans and wildlife alike against these conflicting encounters.

In April 2021, our MNP and PKT staff received an honour from BKSDA to express their gratitude for their work towards conservation of natural ressources in Tangkoko.





## Direct protection

This year again, our conservation officer, field assistants and managers found and destroyed 157 traps and rescued 2 monkeys from traps.



MNP staff rescuing a trapped macaque



Snare traps found in the forest



A female crested macaque with a snare trap still attached to her hind leg



# EDUCATION

## School activities

As last year, TCE has also been impacted by school closures, online teaching, imposed small groups of pupils at schools and limited travel between different districts, all restrictions put in place because of Covid-19, thereby reducing its activities. Nevertheless, between September 2020 and May 2021, we have delivered regular environmental education sessions in local primary and secondary schools (6 interventions in class and one trip to the Tangkoko forest) within 10 classes for a total of 120 pupils aged 10 to 16 living in the Bitung region. Since September 2021, we have started our 11th school year for 88 pupils from 8 local schools.

## Science camp

Thanks to the support of the Hermesen-Foundation, we could welcome 10 students from the 11th Grade of 4 Negeri Senior High School in Batu Putih for the second edition of the Science Camp: a week of immersive research and conservation training at the MNP research station. Between the 24th of October and the 7th November 2021, the students (5 boys and 5 girls) learnt different field and scientific methods and research tools. For example, they ran experiments about the effect of detergent on the environment, notably water characteristics, and learned about stingless bee farming. In addition, they took time to observe the macaques in the forest and collect data



Some of the participants in the second Science Camp

about their behaviour. In the camp, they followed environmental lessons and met several local conservation partners (for example, Tasikoki Wildlife Rescue and Education Centre, Selamatkan Yaki). In January 2022, a symposium will be organised in the town and all participants will share their knowledge about biology, ecology, and macaque behaviour with the local community. Here are some messages shared by the Science Camp participants after their week spent at the MNP research station:

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“Let’s protect the crested macaque, so important for our forest regeneration!” **Marsya**  
“Earth is able to meet all human needs, but not able to meet all human greed” **Manda**  
“Forests are the source of life. Let’s take care of them together” **Sheyla**  
“Science camp gave me the opportunity to learn more about how to protect the forest and the macaques. I have learnt a new skill, which is wildlife photography”. **Deo**  
“We need to protect macaques, they are endemic to North Sulawesi”. **Febrianti**

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## 10 years!

TCE organised a festive event together with our long-term partners (school teachers, NGOs and representatives of the local government) on the 15th February 2021 in Bitung. We celebrated our achievement over the past 10 years through various speeches and photo/video presentations. We also celebrated the involvement of our former pupils (some of them have been involved in helping us with activities) as well as Science Camp participants. We designed original artworks and offered them to our current or former pupils who are true conservation supporters through their help with our activities, and who created beautiful speeches, songs, or drawings as part of a special competition to promote our programme and spread the conservation word within local communities. Some videos about pupil's poetry can be seen here: <https://www.youtube.com/watch?v=7AR9AkMXmR8>

## Awareness campaign

These included a celebration of Earth Day through a tree planting session and beach cleaning event (22nd April, in Batu Putih) and World Clean-up Day through forest and beach cleaning (18th September, Tangkoko Tourism Area and Nature Reserve). Here is a TV coverage about Earth Day: <https://www.youtube.com/watch?v=2rYQwNu1BVl>.



Beach cleaning event and tree planting



## MNP FINANCIAL STATEMENT

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Revenues come from three principal sources. Individual researchers and students pay a fee to stay at the station and use the facilities. It is currently of 500€ per person per month. For the Indonesian staff and students, the fees are paid either by MNP directly or by their international counterparts. The second source comes from grants obtained by the head and co-heads of the project and by the Universities or international partners. The third source comes from donations from individuals or organisations.

Items	Description	Costs in 2021 (€)
7 to 9 employees	research organization, data collection and analysis, reports, outreach, conservation education liaison with villagers and authorities, staff management, health insurance	27,650
Camp maintenance + food	repairs, food, gasoline generator, communication, etc.	9,096
Transportation	car rental, gasoline motorbike bus etc.	846
Research	consumables, technique, cooperations	1,605
Administration	permits, post box, Covid-19 related, fees	3,065
<b>TOTAL</b>		<b>42,262</b>

The project permanently employs between 7 and 9 people: a research manager organising research, a liaison manager responsible for liaising with different authorities, linking research, outreach, education and conservation, as well as managing human resources issues (salaries, health insurance, permits). We are also very proud that our research assistants not only collect biological and behavioural data on the 5 groups of monkeys that are habituated for research, but are also heavily involved in outreach, education, conservation, and eco-tourism. One of them is specifically dedicated to patrolling the forest, linking with the rangers and mitigating issues between people living around the nature reserve and the monkeys. They make the very essential link to the local community. In addition, a cook and a janitor take care of the camp daily maintenance. They are also members of nearby villages and keep the team together through good food and good moods.

Health and risk insurance is required by Indonesian laws for all people working in Indonesia. We provide it for free to our employees as an essential benefit for a rural community.

Permits are required for carrying out research and any professional activities (to the national government) as well as for accessing the nature reserve (to the national and local government).

## TCE FINANCIAL STATEMENT

Items	Description	Costs in 2021 (€)
Coordinators' salaries and insurance	Local coordinators' and assistants salaries and casual staff (school activities, Science Camp); Coordinators' insurance and medicine fees	7,885
Guides' fees	Local guides' fees for school trips to Tangkoko	11
Transportation	Car rental, motorbike rental and gasoline for general coordinators' and volunteers' transportation (meetings, education interventions in schools, events and trainings); Service and maintenance (for the project's motorbikes); Bus rental for pupils' transportation to Tangkoko reserve	2,213
Food	Food for the local coordinators (when outside the headquarters)	1,838
Pedagogical material	Stationeries: books, games, pens, paper, notebooks, ink, photocopies, etc; Creation, edition and printing of our environmental lessons (7 lessons)	3,257
Equipment	Electronic (phone, laptop, printer, speakers, tripod, etc); Personal protection material (masks, sanitizing gel, face shields)	482
Communication	Post, Internet and phone expenses	178
Office	Office rental, electricity, furniture and small equipment	823
Awareness campaigns	Earth Day, 10 year PKT, World Cleanup Day promotion: Material (banners, posters, T-shirts), Prizes, Hall booking, tree planting equipment and food/transport of participants.	1,828
Science Camp	Food, transport, equipment, material	1,519
Administration	Foundation fees and other administrative expenses (land etc)	549
Other	"Solidarity" expenses (wedding, funerals, etc)	18
<b>TOTAL</b>		<b>20,601</b>



## ACKNOWLEDGEMENTS

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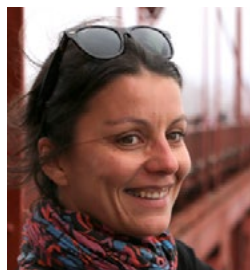
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