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| **Institution:** Liverpool John Moores University (LJMU) | | |
| **Unit of Assessment:** 7 | | |
| **Title of case study:** Improving orangutan conservation through research | | |
| **Period when the underpinning research was undertaken:** 2015 -2019 | | |
| **Details of staff conducting the underpinning research from the submitting unit:** | | |
| **Name(s):** | **Role(s) (e.g. job title):** | **Period(s) employed by submitting HEI:** |
| Prof Serge Wich | Professor in Primate Biology | 01/08/2012 to date |
| **Period when the claimed impact occurred:** 2015-2020 | | |
| **Is this case study continued from a case study submitted in 2014?** N | | |

## 1. Summary of the impact

The results of my research on orangutan conservation have fed into the Indonesian Government orangutan population and viability analyses as well as the 2019-2029 Indonesian Orangutan Action Plan. The International Union for Conservation of Nature, United Nations Environment Programme (UNEP) and several NGOs are using this research to guide their conservation strategies. The study on the description and threats to a new orangutan species has been used by an Indonesian environmental NGO in a court case against the local government for the development of a large hydroelectric project that would severely impact the newly discovered species. I have been an expert witness in the court case as well. Even though the environmental NGO lost this case, pressure from NGOs, the IUCN, and others have led the company to increase mitigation plans and finance institutions to decline funding for the project. This project seems stalled now and thus for now gives hope for conservation for the rarest great ape on the planet (the Tapanuli orangutan that I helped describe in 2017).

## 2. Underpinning research

Effective orangutan conservation needs data on the distribution and density of all three species as well as their population trends. In addition, it needs assessments of which factors are leading to their decline and which conservation strategies and actions can reduce the negative impacts of those factors. Such research then needs to be integrated into the governments' action plans for orangutan conservation. Therefore, research has aimed to be relevant for all these aspects. Two studies have used spatially-explicit models providing detailed results on the distribution and density of orangutans throughout both the islands of Sumatra and Borneo (UR1 & UR2). Because this is the first time such methods have been applied there is now a solid baseline for all three orangutan species to evaluate conservation actions against. At the time of the research on UR1 the orangutans on Sumatra were still considered as one species but because of research for UR3 it is now known that the orangutan population in the Batang Toru area constitutes a new species (the Tapanuli orangutan). Several studies indicate that habitat loss and killing of orangutans are the two main threats to orangutans (UR1, UR2, UR4), but that orangutans are quite flexible in terms of habitat disturbance and can to a certain extent survive in a matrix of varying land uses (forest, oil palm, pulp and paper, and agroforestry). In addition, for the Tapanuli orangutan research shows that a hydro-electric project is the main threat (UR5). As an extension of the work on orangutans and palm oil a study was conducted on the potential implications of the spread of oil palm plantation on primates in Africa (UR6). That study found that there is little area available that has a high suitability for oil plam and low primate diversity. The implication is therefore that the expansion of oil palm in Africa will lead to major negative impacts on primate diversity.

There are several recommendations coming out of UR1-6. First, to halt or reduce the decline of all three orangutan species there needs to be a halt in the conversion of the forests they occur in (primary and logged). Second, reduce killing and capturing of orangutans in human-dominated landscapes so that orangutans can use those areas to move between forest areas. Such connectivity is essential with decreasing population sizes. Third, halt the development of the

hydro-electric plant that will fragment the range of the Tapanuli orangutan and will reduce two populations to numbers too small to be viable. Four, collaborate with all stakeholders in the palm oil sector to work towards sustainable palm oil so that impact on orangutans is minimized.

## 3. References to the research

All of these journal outputs have been through a rigorous peer-review process prior to publication.

**UR1**: Voigt M, ***Wich SA***, Ancrenaz M, Meijaard E, Abram N, Banes GL, Campbell-Smith G, d'Arcy L, Delgado RA, Erman A, Gaveau D, Goossens B, Heinicke S, Houghton M, Husson SJ, Leiman A, Llano Sanchez K, Makinuddin N, Marshall AJ, Meididit A, Meittinen J, Mundry R, Musnanda, Nardiyono, Nurcahyo A, Odom K, Panda A, Prasetyo D, Priadjati A, Purnomo, Rafiastano A, Russon AE, Santika T, Sihite J, Spehar S, Struebig M, Sulbaran-Romero E, Tjui A, Wells J, Wilson KA, Kuehl H (2018) **Global demand for natural resources eliminated more than 100,000 Bornean orangutans**. Current Biology 28: 761-769.

**UR2**: ***Wich, Serge A.***, Ian Singleton, Matthew G. Nowak, Sri Suci Utami Atmoko, Gonda Nisam, Sugesti Mhd Arif, Rudi H. Putra et al. **"Land-cover changes predict steep declines for the Sumatran orangutan (Pongo abelii)."** Science advances 2, no. 3 (2016): e1500789.

**UR3**: Nater A, Mattle-Greminger MP, Nurcahyo A, Nowak MG, de Manuel M, Desai T, Groves C, Pybus M, Sonay TB, Roos C, Lameira AR, ***Wich SA***, Askew J, Davila-Ross M, Fredriksson G, de Valles G, Casals F, Prado-Martinez J, Goossens B, Verschoor EJ, Warren KS, Singleton I, Marques DA, Pamungkas J, Perwitasari-Farajallah D, Rianti P, Tuuga A, Gut IG, Gut M, Orozco-terWengel P, van Schaik CP, Bertranpetit J, Anisimova M, Scally A, Marques-Bonet T, Meijaard E, Krützen M (2017) **Morpometric, behavioural, and genomic evidence for a new orangutan species**. Current Biology 27: 3487-3498.

**UR4**: Spehar, Stephanie N., Douglas Sheil, Terry Harrison, Julien Louys, Marc Ancrenaz, Andrew J. Marshall, ***Serge A. Wich***, Michael W. Bruford, and Erik Meijaard. **"Orangutans venture out of the rainforest and into the Anthropocene."** Science Advances 4, no. 6 (2018): e1701422.

**UR5**: ***Wich, Serge A.***, Gabriella Fredriksson, Graham Usher, Hjalmar S. Kühl, and Matthew G. Nowak. **"The Tapanuli orangutan: Status, threats, and steps for improved conservation."** Conservation Science and Practice (2019).1: e33

**UR6**: Strona, Giovanni, Simon D. Stringer, Ghislain Vieilledent, Zoltan Szantoi, John Garcia-Ulloa, and ***Serge A. Wich***. **"Small room for compromise between oil palm cultivation and primate conservation in Africa."** Proceedings of the National Academy of Sciences 115, no. 35 (2018): 8811-8816.

## 4. Details of the impact

This research has had impact in several ways that have improved orangutan conservation. First of all it (UR1-5) has impacted the Indonesian Governments Population Habitat and Viability Assessment (PHVA, [S1]) in which this research was used for the population numbers as well as distribution and threats. The PHVA formed the basis for the Indonesian Government's Indonesian Orangutan Conservation Action Plan and Strategy (2019-2029, [S2]), which is the highest level Indonesian conservation plan and is expected become law (S3). As a result of this research this Action Plan and Strategy now takes hunting into consideration as a major threat to orangutans which was argued in UR1 and UR4 as well has more focus on managing orangutans outside of

forest areas as was recommended by (UR4). Second, UR3 and UR5 have been important for both the PHVA and the Action Plan and Strategy as they provide the research on the description of the new orangutan species as well as its population numbers and threats and thus impacted the conservation strategy of the government. Dr. Priadjati, Chairman of Forum Orangutan Indonesia: *"Both of these documents have benefited immensely from the conservation science of Prof Wich"* [S3].

Third, between 2017 and 2020, UR3 and UR5 have impacted the International Union for Conservation's (IUCN) Section on Great Apes of which I am a co vice-chair. They sent letters of concern about a major hydro-electric plan in the range of the new orangutan species (Tapanuli orangutan) to the Indonesian President, other members of the Government, potential funders such as the Bank of China. In addition, they published a statement that suggests a moratorium on all development in the range of the Tapanuli orangutan until a detailed environmental impact assessment has been developed [S4]. The company developing the hydro-electric project has now been increasing its mitigation efforts and the Indonesian Government has put an orangutan monitoring project in place in the area where the project occurs [S4]. News reports as well as IUCN sources have stated that major banks declined funding the project because of environmental concerns and that the project is stalled for now giving hope for the Tapanuli orangutan [S4]. In addition, UNEP's Great Apes Survival Partnership has also focused on the Tapanuli orangutan's conservation as a result of my research [S5].

Mr. Byler, Vice-Chair of the IUCN Section on Great Apes: *"The research by Wich on the Tapanuli orangutan has spurred the SGA to focus on the threats facing this species and particularly the hydro-electric project that is being developed in the habitat of the Tapanuli orangutan and threatens to destroy part of its habitat and fragment its distribution. As a response the SGA has been sending letters to the Indonesian President and other members of the Government as well as to the Bank of China expressing the SGA's concern about the development of a hydro-electric project in the area where the Tapanuli orangutan occurs. The IUCN SGA has also published a statement asking for a moratorium on the development of the hydro-electric project and other projects within the Tapanuli orangutan distribution so that in-depth environmental impact assessments can be conducted. IUCN SGA members have also used the research by Wich in discussions with the Bank of China. Wich's research has also been used in a two-year document that the IUCN produced on the world's 25 most endangered primates. This document is a main influencing document for policy change and to increase funding for the most endangered primates. The 2018-2020 report includes the Tapanuli orangutan."* [S4].

Dr. Refisch, UNEP's GRASP Programme Manager and Coordinator: *"Lastly his research on the Tapanuli orangutan has led to a change in policy focus whereby we are focusing on improving protection of this species. Directly this has led to our previous Executive Director debating the precarious status of the Tapanuli orangutan with the Indonesian Government at the ministerial level. Based on Wich's research GRASP has also sent out letters of concern to the Indonesian President and other members of the Government about the development of a hydro-electric project in the area where the Tapanuli orangutan occurs. The same research has also supported GRASP Ambassador Nadya Hutagalung to express her concern about the status of the Tapanuli orangutan to the Indonesian Government."* [S5].

Fourth, UR3 and UR5 have been important for a court case by WAHLI (the largest Indonesian Environmental NGO) against the Provincial Government of North Sumatra for giving out a permit for the development of a large hydroelectric dam in the area of the newly discovered Tapanuli

orangutan. I was called as an expert witness for this court case and appeared in court in 2019. The Bank of China has decided not to fund the hydro project and their concerns about the environmental impact was one of the reasons not to fund the project.

Fifth, the research on orangutan numbers in Sumatra (UR2) has helped orangutan conservation NGOs to conduct their work more efficiently [S6 and S7]. For the Orangutan Information Centre (OIC) this led to reforestation efforts that have led to more orangutan habitat.

Mr. Hadisiswoyo, Founder of the Orangutan Information Centre *"One important consequence of the work of Prof Wich has been to increase forest restoration in crucial areas of the Leuser Ecosystem. The reforestation efforts have led to an increase the habitat for orangutans."* [S6].

For OIC and the Sumatran Orangutan Conservation Program (SOCP) this has led to a focus their conservation efforts to those areas in terms of patrols, orangutan rescue efforts, policy efforts, and working with local communities. For instance, the work on orangutan distribution has allowed SOCP to be involved in the Indonesian spatial plans and in 2015 have a logging concession turned into a protected area. The research has also allowed them to be specific towards the government and companies about how many orangutans would be at risk when certain changes in spatial land-use planning would be made. Overall it has influenced much of their conservation efforts.

Dr. Singleton (OBE), Director of the Sumatran Orangutan Conservation Programme: *"the research conducted by Prof. Wich has been extremely helpful to us in shaping much of our conservation work."* [S7].

Sixth, the studies on the orangutans and other primates (UR1-6) have also been used in the International Union for the Conservation of Nature (IUCN) report on oil palm and biodiversity that was published in 2018 [S8] as well as two Great Apes Survival Partnership (GRASP) (part of the United Nation Environmental Program) policy reports that were published in 2015 (Future of the Bornean orangutan that focused on climate change, [S9]) and 2016 (Oil palm paradox, [S10])). Both IUCN and GRASP have been using this research as part of their conservation strategies, which include the IUCN Redlist assessments. The oil palm report has according to Mr. Byler vice-chair of the IUCN's Section on Great Apes *"been of major influence on the debate on whether palm oil should be banned or whether it should be sustainably produced."* [S4].

The IUCN and GRASP have also used this research (UR1-5) in a report to the Convention on International Trade in Endangered Species (CITES). UNEP is using the research as part of the strategies of their Great Apes Survival Partnership (GRASP), which they use in their multilateral discussions on great ape conservation [S5]. To broaden the debate about oil palm and primate diversity the study that was conducted (UR6) on the potential impact of oil palm on primate diversity was used in the IUCN oil palm report [S8] which is being used by the IUCN to stimulate the debate about oil palm and biodiversity and vegetable oils and biodiversity in general. It has been suggested this has helped to steer the debate from a ban to oil palm to one of sustainable oil palm [S4].

Mr. Byler, Vice-Chair of the IUCN Section on Great Apes: *"It is our understanding that the report has led to a more nuanced debate and has facilitated efforts to grow support for a move towards sustainable palm oil."*

Dr. Refisch, UNEP's GRASP Programme Manager and Coordinator *"In addition, the GRASP Palm Oil Paradox report (S9) as well as the Future of the Bornean Orangutan (S8) reports have relied*

*heavily on Wich's research. The consequence of this has been that GRASP is now having a strong focus on sustainable palm oil and climate change in its projects."* [S10].

Overall in my role as a scientist at LJMU, but also in my role as vice-chair of the IUCN Section on Great Apes and chair of the scientific commission of UNEP's Great Apes Survival Partnership, I have been able to use scientific research to provide input on several policy documents from UNEP, IUCN, the Indonesian Government, helped the conservation of world's rarest great ape (the Tapanuli orangutan) and have impacted the conservation work of several NGOs in Indonesia.

**5. Sources to corroborate the impact**

S1: Orangutan PHVA (2016: http://websites.milonic.com/forina.org/)

S2: Indonesian Orangutan Action and Strategy Plan 2019 – 2029 (not publically available as still under development)

S3: Letter from Dr. Priadjati, Chairman of Forum Orangutan Indonesia

S4: Letter from Mr. Byler, Vice-Chair, of the IUCN Section on Great Apes

S5: Letter from Dr. Refisch, UNEP's GRASP Programme Manager and Coordinator

S6: Letter from Mr. Hadisiswoyo, Founder of the Orangutan Information Centre in Indonesia

S7: Letter from Dr. Singleton (OBE), Director of the Sumatran Orangutan Conservation Programme in Indonesia

S8: IUCN Oil Palm and Biodiversity report (2018): https://www.iucn.org/resources/issues-briefs/palm-oil-and-biodiversity

S9: GRASP Future of the Bornean Orangutan (2015): https://www.un-grasp.org/what-we-do/publications/

S10: GRASP Palm Oil Paradox (2016): https://www.un-grasp.org/what-we-do/publications/