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PERSPECTIVES AND NOTES

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The Tapanuli orangutan: Status, threats, and steps for improved conservation

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Ever since the Tapanuli orangutan (*Pongo tapanuliensis*) was described two years ago (Nater et al., 2017) it has frequently been in the news for two primary reasons. First, because of the excitement generated by the discovery of the first new extant great ape species since 1929. Second, because of the immediate threat posed to the new species by the development of a hydrodam to generate electricity (Sloan, Supriatna, Campbell, Alamgir, & Laurance, 2018). As the species has only been described recently there is no paper that summarizes its status and threats even though some of that information is available from a previous study where this species was still considered a population of the Sumatran orangutan (*Pongo abelii*) (Wich et al., 2016). In this letter, we aim to remedy this gap by providing a succinct overview of the status of and threats to the Tapanuli orangutan, as well as by identifying key steps toward improved conservation. This is particularly relevant as there is a need to be able to determine the impact of the hydroelectric dam development which is best achieved from a clear baseline.

As with the other two orangutan species, the Tapanuli orangutan is considered to be Critically Endangered by the International Union for Conservation of Nature (IUCN) (Nowak, Rianti, Wich, Meijaard, & Fredriksson, 2017). The species is only found in the forests of the Batang Toru Ecosystem in the province of North Sumatra, Indonesia (Figure 1). Based on extensive survey work from 2000 to 2012 it has been determined that the total extent of its distribution covers 1,023 km^2 (Wich et al., 2016). It is found in three main forest blocks with a total of 767 individuals (95% confidence intervals [CI] [231–1,597]): the west block which houses 581 individuals (95%CI [180–1,201] [sum of 533, 42, and 6 in Figure 1]), the east block with 162 individuals (95% CI [46–341]), and the Sibual-buali Reserve with 24 individuals (95% CI [6–53], based on (Wich et al., 2016), with possibly small populations to the north and/or in the Lubuk Raya Reserve). Of this distribution, roughly 85% is under some form of protection status, but 15% is land for other uses (Nowak et al., 2017). The west block and the

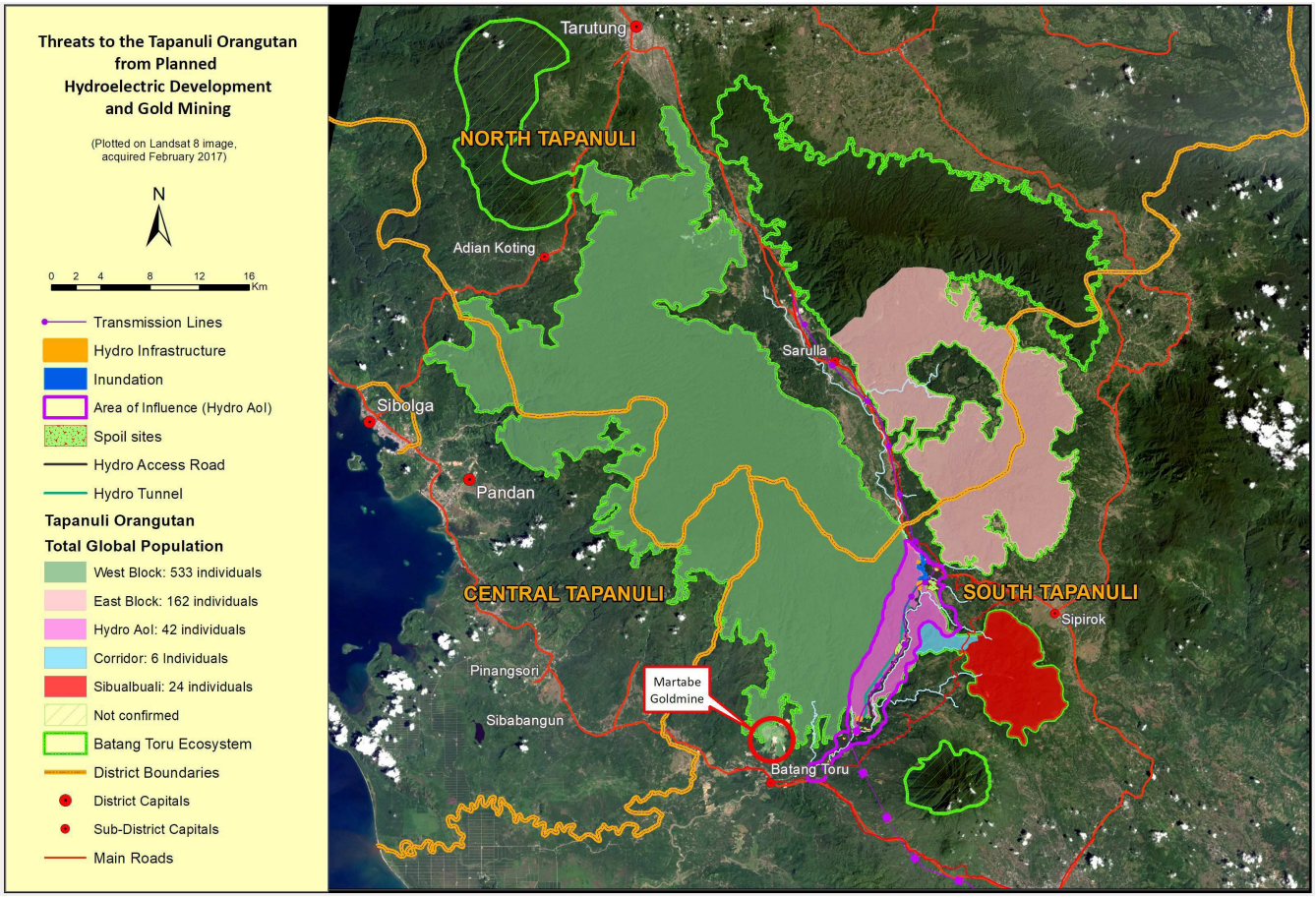

FIGURE 1 Map showing the distribution of the Tapanuli orangutans, their population numbers and threats. The 95% confidence intervals (CI) for the various areas are: West block: 164–105, East block: 46–341, Hydro AoI: 14–84, Corridor: 2–12, Sibual-buali: 6–53

Sibual-buali Reserve are still moderately connected and orangutan dispersal is expected to occur between those areas based on the locations where nests have been found during surveys (Figure 1). It is less clear if orangutans can still move between the west and east block because of the provincial road from Tarutung to Padangsidempuan separating these blocks as well as the Batang Toru River.

There are several threats to the Tapanuli orangutan. Between 1985 and 2007, 43.3% of the forests in the province of North Sumatra (where the Tapanuli orangutan occurs) have been lost (Wich, Riswan, Jenson, Refisch, & Nellemann, 2011). Annual deforestation rates were particularly high from 1985 to 1990 (4.2%), decreased from 1990 to 2000 (1.2%), and then increased again from 2000 to 2008/2009 (2.3%). Particularly recent losses of peat swamp areas on the coast where the species had been found in the past (Wich et al., 2003) have led to a reduction of forest for the Tapanuli orangutan as well as the slower but steady forest loss that occurs around all three blocks. During 1990-2009, annual forest loss for the area in which the Tapanuli orangutan occurs was calculated as 0.11%, with a range of <0.01–0.84% (Wich et al., 2011). This is lower than the overall annual forest loss for North Sumatra due to the Tapanuli orangutan occurring in more mountainous areas which have lower deforestation rates than areas at lower elevations. The other main threat is killing of orangutans. This occurs in two circumstances. First, orangutan hunting still occurs in the area (Wich et al., 2012). Even though hunters do not seem to go into the forest to specifically hunt for orangutans, they do opportunistically hunt/kill them for food when encountered (Wich et al., 2012). Second, orangutans that venture into community plantations have been killed as a result of human-orangutan conflict (Nater et al., 2017). As orangutans are long-lived and have slow reproductive rates, even low levels of extrinsic mortality (i.e., >1% per year, which in this case is just a few individuals) represent a major threat to the long-term growth, stability, and persistence of the small-sized Tapanuli orangutan populations (Marshall et al., 2009).

In addition to these threats there is a hydroelectric dam with associated infrastructure planned in the area (Sloan et al., 2018). The area of influence of the dam is planned in an area with the highest Tapanuli orangutan densities and covers 5.5% (42 individuals, 95%CI [14–84]) of the total

Tapanuli orangutan population (Wich et al., 2016). Orangutans in this area and surroundings will be negatively impacted through habitat degradation and loss. This is of particular concern for orangutan females because they are philopatric and tend not to move when they lose parts of their home range (van Schaik, 2004) and risk starvation or being killed when this occurs. Such home range loss and subsequent dispersal can also lead to compression of orangutans in adjacent areas and inflated densities past the carrying capacity and hence lead to food shortages and future reductions in density (Husson, personal communication, January 15, 2019). If parts of their home range are lost, orangutans in disturbed areas will have to use the remaining parts of their own home range more intensively than before, which can also lead to social tension between females (Ashbury et al., 2015).

Additionally, the hydroelectric dam and its associated infrastructure will separate the Sibual-buali Reserve from the west block and will also impact the options for reconnecting the east and west block. Over 20 km of road and 14 km of electricity transmission lines through Tapanuli orangutan habitat are planned, and at least 3 million m3 of excavated spoil is planned to be dumped in orangutan habitat (Comanditaire Venotschap (CV) Global Inter System, 2014, 2016). Furthermore, it is well-established that infrastructure development, especially roads, can facilitate human access into previously inaccessible areas, eventually leading to additional and often unrestricted levels of habitat degradation and loss, hunting, and/or human-animal conflict (Laurance, 2015; Laurance & Arrea, 2017; van der Ree, Smith, & Grilo, 2015).

Taken together, the hydroelectric project will drive the Sibual-buali and Sitandiang corridor population (30 individuals, 95% CI [8–65]) and east block population (162 individuals) to a status of nonviable, which is defined here as a population with 0% probability of extinction and >90% retention of genetic diversity for a minimum of 1,000 years (Singleton et al., 2004; Marshall et al., 2009). Following the results of the 2004 orangutan Population and Habitat Viability Assessment (PHVA) workshop, a population of >500 individuals is considered viable using this definition (Singleton et al., 2004). This will leave the west block as the last remaining viable Tapanuli orangutan population. But given the current and projected threats of habitat degradation and loss, hunting, human-orangutan conflict, an expanding goldmine, and a neutralized logging concession in the area (GoNSP, 2017; MoEF, 2017; MoF, 2014), this is an extremely risky scenario and should therefore be avoided at all costs, because these threats could drive this population to nonviable status within as few as 1–2 generations.

In conclusion, the Tapanuli orangutan was the latest extant great ape to be discovered, but given its extremely small population numbers and current and projected threats, it might well be the first one to go extinct. This would contravene the Indonesian Law Regarding the Conservation of Biological Resources and Ecosystems (Law No. 5/1990), as well as the Aichi targets to which the Indonesian government has committed (Darajati et al., 2016; PoRI, 1990). As such, it is imperative that the Government of Indonesia takes some bold steps to secure its future, of which the most important short-term ones are: (a) to halt the hydroelectric dam development; (b) change the land use status of the unprotected 15% of the area where the Tapanuli orangutan occurs to a protected status; and (c) establish a corridor between the west and east block and improve the corridor between the west block and Sibual-buali Reserve. In addition, the ongoing hunting and small-scale deforestation need to be halted through serious enforcement of Indonesia's regulations concerning protected species.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

AUTHOR CONTRIBUTIONS

S.A.W., G.F., G.U., and M.G.N. conceived the paper, S.A.W., G.U., M.G.N., and H.S.K. conducted the analyses, S.A.W., G.F., G.U., H.S.K., and M.G.N. wrote the paper. No ethics approval was needed for this study. All data are available on request from the authors.

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