

Anecdotal pre- and post ASF population trends in *Sus barbatus* in Borneo

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Abstract

We compiled anecdotal information from camera trapping programs across Borneo (and one Sumatra site) to assess the changes in Bearded Pig (*Sus barbatus*) abundance following the arrival of African Swine Fever on Borneo in 2019. These data from independent sites indicate severe population declines, with locally up to 100% mortality rates. Based on these preliminary assessments, we suggest that at least the Bornean subspecies of *Sus barbatus* should be uplisted on the IUCN Red List of Threatened Species to Critically Endangered based on Criterion A2BE.

Background

In 2018, African Swine Fever (ASF) reached the first Asian country and since then has spread rapidly throughout the region, arriving in Indonesia at the end of 2019 and in Malaysia at the beginning of 2021. The virus infection causes nearly 100% mortality in non-African pig species and there is no treatment or vaccine available. The disease is transmitted easily through direct contact between pigs, contact of pigs with contaminated materials or substrates, infected carcasses or contaminated meat.

One of the threatened species that has already been confirmed to be negatively affected by ASF is the bearded pig (*Sus barbatus*). There are two sub-species. *Sus b. barbatus* inhabits Borneo and Peninsular Malaysia, while *S. b. oi* occurs on Sumatra. Bearded pigs are listed as Vulnerable on the IUCN Red List, due to a 30% population decline in the last generations, assessed in 2017 – hence before ASF arrived in Asia.

The IUCN SSC Wild Pig Specialist Group is concerned with the conservation of wild pig species. We have gathered evidence from our networks in the region that the population decline in bearded pigs has worsened considerably. Many populations throughout its range have crashed or disappeared completely. We argue that the population size has reduced by $\geq 80\%$ over the last three generations, based on an index of abundance appropriate to the taxon and the effects of ASF. This warrants the status "Critically Endangered" (CR A2BE), as opposed to the outdated status "Vulnerable". We are convinced that the bearded pig is at very high risk of extinction if we do not act immediately.

To support the revision of the IUCN Red List assessment for *Sus barbatus*, we collected preliminary information from across Borneo from scientists using camera trapping methods. In October 2023, we asked people from our scientific networks to send us information about pre-and post ASF trends in bearded pig occurrence in their camera trap photo series. Below these results are provided to support further trend analyses.

Results

Sabah

Sukau, Lower Kinabatangan, Sabah. Since the ASF arrived in Sukau, not a single sign of bearded pig has been recorded at our site. This includes camera trap pictures and indirect sightings. The situation is the same in the Danau Girang Field Center. We have the data to support this claim, and estimate 100% mortality in the forests of lower Kinabatangan between 2019 and now. However, we find bearded pigs in the plantations, just a few km away from the forest. As if the two sub-populations didn't mix: indeed, pigs did survive the ASF in the plantations and have not recolonized the forests of King yet. Very interesting.

Danau Girang and Tabin Wildlife Reserve, Sabah. We are not getting any pics of bearded pigs in Danau Girang since ASF hit the Kinabatangan area. I can provide data/evidence if needed. I know that pigs (with piglets) have been caught on camera in Tabin Wildlife Reserve by BORA (Dr Zainal).

Tawau Highlands, Sabah. Bearded pig declined rapidly from Mar 2021 in the Tawau Highlands (Tawau Hills Park, Wullersdorf FR, Ulu Kulumpang. I have analysed 2023's data, but I understand that records are still extremely low (Figure 1).

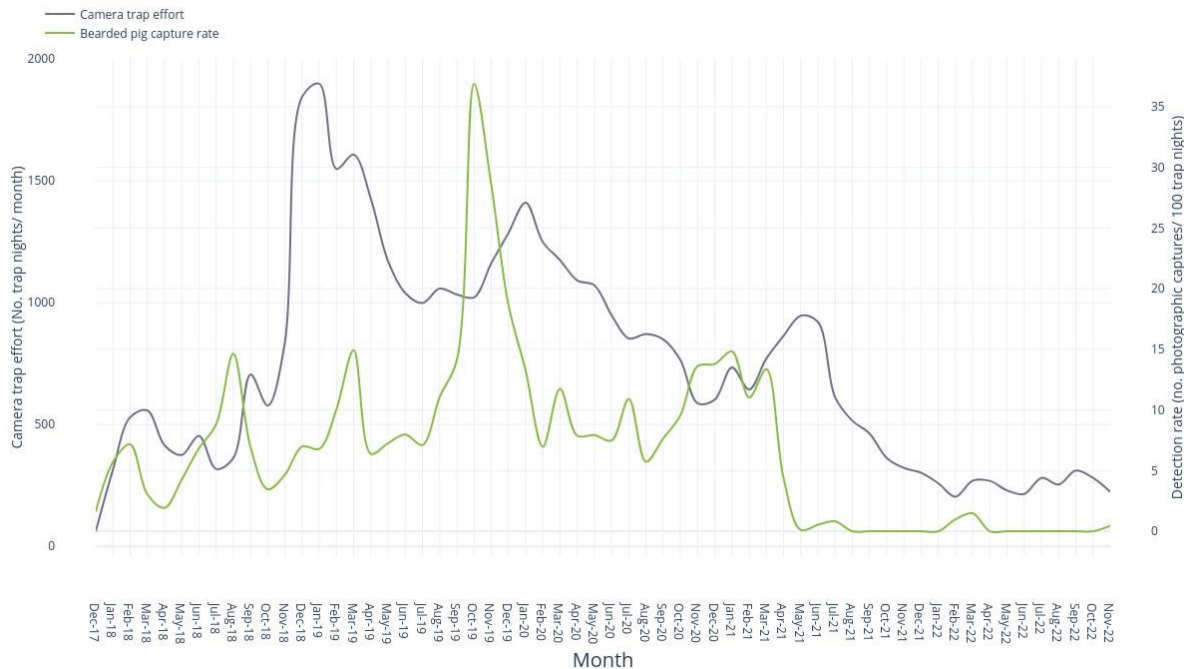


Figure 1. Bearded Pig capture rate in Tawau Hills Park

Brunei

Ulu Temburong, Brunei Darussalam. Bearded pigs have been completely absent from camera trap pictures since 2021, whereas the species used to be among the more commonly photographed.

Kalimantan

Different sites in Kalimantan. We have been analysing camera data from 11 sites in Kalimantan, including a few contributed by people on this list. By the end of the year 5 of these sites will have a second survey post-ASF. At the 2 sites we have resampled in Rungan (Kalteng) the mammal densities are lower for anything hunted, but (probably) also a big decline in pigs – still collecting the last of the cams.

Gunung Palung National Park, West Kalimantan. ASF hit Gunung Palung late. I hoped we might be spared it as GP is pretty isolated now, but alas we weren't. We first detected what we presumed to be its effects in Sept 2022, when we had a ton of pig deaths. Our population has crashed since then. Our line transects and camera trapping ended in late 2020, though, so we are not in a position to quantitatively document the ASF-related decline.

Sungai Wain, East Kalimantan. Bearded pigs dropped seriously in numbers but oddly no pig corpses were encountered, like people said they did in Sabah. Some pigs certainly survived, as we have them now again on camera trap [2023]. Declines started mid 2021. I have shared our CT data till end of 2022 with Matt, and he can share those data with you. I would guesstimate we've had a 90-95% drop, but pigs with piglets have been caught on CT again.

Tanjung Puting National Park, Central Kalimantan. An October 2023 survey revealed that Bearded Pigs were still common in this isolated national park, likely indicating that the disease had not yet spread to this part of southern Borneo.

Sumatra

In Sumatra we resampled the Kampar peninsula with >200 cameras. Bearded pigs were dominant in 2015, but completely disappeared by 2022 (Figure 2).

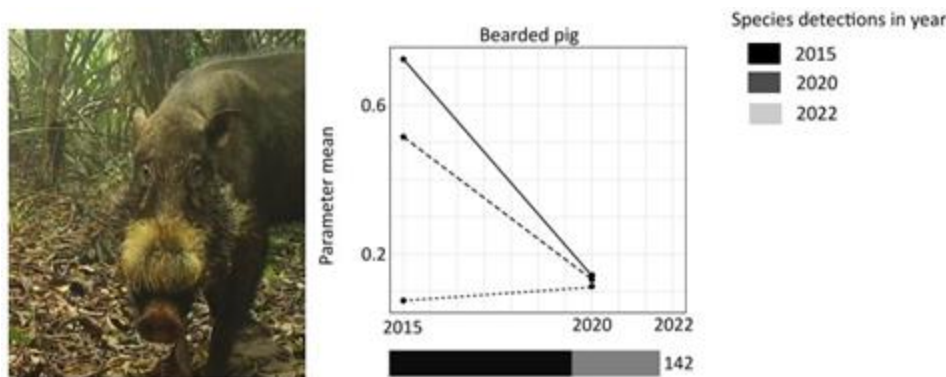


Figure 2. Bearded pig detection in Kampar, Sumatra

Discussion

While the above field reports are not based on structured pre- and post ASF abundance or occupancy assessments, all reports indicate strong declines in bearded pig populations following ASF local outbreaks, with the exception of Tanjung Puting in the south. While it is difficult to quantify these population trends, local declines of 90-100% in areas with ASF outbreaks seem to be likely. This would warrant a uplisting of the Bornean subspecies to Critically Endangered based on Criterion A2BE (IUCN 2012): An observed, estimated, inferred or suspected population size reduction of $\geq 80\%$ over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on:

(b) an index of abundance appropriate to the taxon

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

It is unclear whether the species can recover from these declines. Bearded pigs on Borneo have reportedly been badly affected by disease in the past. Knapen (1997) reports on a rinderpest epidemic that killed a large proportion of the cattle population of Southeast Borneo between 1871 and 1872 before spreading to the bearded pig population, which it affected in areas as far afield as the Upper Kahayan and Kapuas. In 1878, rinderpest struck once more, again hitting the cattle population first and later killing pigs in large numbers. Another epidemic was reported by Nieuwenhuis (1907), who mentions that during his first journey through central Borneo in 1894 pigs were rare, because both the wild and domestic population had been killed off by an epidemic in central Borneo in 1888 and 1889. Feuilletau-de Bruyn (1933) further reports that in 1906, 'very many bearded pigs' succumbed to a contagious disease in the Tabalung area (north-east Ulu Sungai, S. Kalimantan). African Swine Fever, however, tends to result in low population recovery rates (Costard et al. 2009; Luskin et al. 2021; Penrith et al. 2004).

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