Distribution and Conservation of the Preuss’s Red Colobus (Piliocolobus preussi) in Nigeria

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Abstract: Preuss’s red colobus (Piliocolobus preussi) is listed as critically endangered by IUCN, its survival threatened by hunting and habitat loss. P. preussi is endemic to Nigeria and Cameroon. In Nigeria, it is known only from the Oban Division of Cross River National Park (CRNP). However, few surveys of P. preussi have been conducted in Nigeria and information on its current distribution and abundance within the Park is limited. Although CRNP is arguably the richest site in Nigeria, it has been poorly protected and neglected for many years and hunting is widespread. In 2016, WCS helped reorganize the ranger program in Oban and established a new law enforcement monitoring system based on the Spatial Monitoring and Reporting Tool (SMART). Since the introduction of SMART in Oban, effectiveness of law enforcement patrols has improved and encounter rate of hunting signs such as wire snares, hunting camps, and empty cartridges declined in the areas patrolled. Encounter rate of wire snares declined from 1.44/km in 2015 to 0.01/km in 2017, encounter rate of hunting camps declined from 0.03 /km in 2015 to 0.01/km in 2017, and encounter rate of empty shotgun cartridges from 0.88/km in 2015 to 0.17/km in 2017. Presence data collected by ranger patrols is used to monitor abundance and distribution of P. preussi within the Park. Encounter rate of Preuss’s red colobus in Oban in 2016 and 2017 was 0.001/km and observations were limited to the area around the Nigeria-Cameroon boundary.

Keywords: Piliocolobus preussi, Law Enforcement Monitoring, SMART, Conservation, Cross River National Park

INTRODUCTION
The Critically Endangered Piliocolobus preussi is found only in Nigeria and Cameroon, particularly, the Oban Division of Cross River National Park and extending into the adjacent Korup National Park in Cameroon. Report showed that this species was also recorded from the Ebo Wildlife Reserve in Cameroon. Most recent taxonomic arrangements of the colobus monkeys either divide the red colobus and the Olive Colobus into two genera, Piliocolobus and Procolobus, respectively (e.g., Kingdon 1997, Groves 2005, Struhsaker, 2005, Oates et al, 2016), or consider them to belong to one genus, Procolobus, with two subgenera (Procolobus for the Olive Colobus and Piliocolobus for the red colobus). Although the distribution of this species has been ascertained in Nigeria, the population ecology of this primate is poorly documented. It is estimated that a population of 10,000 and 15,000 may be present in Korup National Park Cameroon, (Oates et al, 2016).

This species is estimated to have undergone a decline of more than 80% over the last three generations (Oates et al, 2016). This decline is as a result of consistent hunting of the species for bush meat and severe habitat loss to rapid commercial agriculture in both Cameroon and Nigeria. Red colobus are good indicators of the overall health of Africa’s rain forests because they seem particularly sensitive to habitat degradation (Struhsaker, 1975, 1997, 2005). Thus, Healthy populations of red colobus generally indicate healthy forest ecosystems (Struhsaker, 2005). However, this species is estimated to have undergone a decline of more than 80% over the past three generations, due to high levels of hunting and habitat loss. It is now confined mainly to Korup National Park and a small population within the Oban Division of Cross River National Park (Ibid, 2016).

In recent time, there have been growing conservation awareness and action to protect this species in both Nigeria and Cameroon. This project builds on (Oates, 1996 and Eniang, 2002), establishing a viable conservation programme, particularly an effective law enforcement to improve the conservation of Red colobus and in response to alarming hunting for the bush meat market and threats from commercial agriculture in the Oban Division of Cross River National Park. Our finding clear recent argument on the extinction of Preuss’s Red colobus in Nigeria and affirms its presence and distribution by (Eniang, 2002). In 2014, the Wildlife Conservation Society Nigeria Program introduced a CyberTracker-based monitoring conservation project in the Oban hills with funding from the IUCN Save Our Species fund for threatened primates and the North Carolina Zoo.

The project primarily aimed at ascertaining the presence and distribution of P. preussi in Oban as well as improving its conservation, through long distance foot anti-poaching patrols, reduce hunting levels and build capacity for collecting data on P. preussi. Following this, in 2015 SMART technology for Law Enforcement Monitoring replaced CyberTracker and has continued to improve conservation in the Oban division of CRNP. We recorded huge success in this project through showing the distribution of P. preussi in Oban, strengthening of existing law enforcement efforts by improving the frequency, coverage, duration and the efficacy of anti-poaching patrols as...
well as measure the effectiveness of rangers. Results from the project has been harnessed to adaptively manage the Cross River National Park and in combating various threats facing Pan paniscus and other primate species in the area.

**METHODOLOGY**

The Cross River forest area lies within the Gulf of Guinea Forest region (5° 14′–6° 22′N and 8° 37′–9° 20′E), between the Rivers Cross and Sanaga, including the continental-shelf island of Bioko and the associated Cameroon Highlands (Bergl et al., 2007; Oates et al., 2004). The area is possibly the largest remaining relatively undisturbed block of contiguous forest in West Africa (Oates et al., 2004). The vegetation is a combination of montane and lowland rainforest and forms part of the hygrophilous coastal evergreen rainforest. The Cross River National Park (CRNP) being the largest portion of the Cross River Forests, represent the most extensive area of tropical rainforest remaining in Nigeria today.

The park was created in 1991 from existing forest reserves and it is managed by the Nigeria National Park Service. Cross River National Park consists of two separate divisions: Oban and Okwangwo. The Oban Division covers an area of roughly 3,000 km² with high levels of diversity and endemism and is a particularly important site for rare and threatened primates including the Preuss’s red colobus Piliocolobus preussi, Drill Mandrillus leucophaeus and the Nigeria-Cameroon chimpanzee Pan troglodytes ellioti.

These forest blocks are contiguous with those of southwestern Cameroon and represent the western extension of the Cameroon Highlands into southeastern Nigeria (Oates et al., 2004). Oban Division is further divided into the western sector and eastern sector (also referred to as the Ikpan block). This study was focused on the Ikpan block. This forest block is adjacent to Korup National Park of Cameroon and was originally part of the Oban Hills forest reserve. It covers approximately 100 km² of mostly intact tropical moist forest and areas of disturbed forest (Eniang, 2002). The Oban Division of Cross River National Park is predominantly surrounded by people whose occupation is subsistence hunting and farming, as well as collection of non-timber forest products. The Park has faced severe threats from illegal logging, and expanding agriculture particularly commercial plantations. Moreover, hunting to supply the lucrative bush meat trade is considered the main threat to primates and other species. Comparatively, conservation efforts over the years in the Oban Division of Cross River National Park has been relatively poor; park rangers were not well equipped or motivated for camping and long-distance patrols to combat illegal activities in the protected area and there was little or no monitoring measures put in place to check rangers effectiveness in anti-poaching patrols.

Base camps were set up in choice locations and or in established hunters’ camps. Two teams always camped together and carry out anti-poaching patrols in opposite directions each day and regrouped after the day’s work. This method was preferred for proper supervision of both teams by the team leader, Peter Abanyam. Each team comprised of at least six CRNP rangers. The patrol teams searched areas where hunting activities were suspected, concentrating the search in valleys, riversides, suspected hunting trails and where necessary, made new patrol trails to link targeted hunting trails. Signs of wildlife and human activities along patrol trails were recorded using handheld CyberTracker, SMART and GPS units.

However, small groups of three to four persons conducted surveys at areas with previous records of Piliocolobus preussi, while new places were explored. Eniang (2002), conducted similar surveys in the same Ikpan forest block using recce and transect walk, to ascertain population distribution and abundance. We in our study used the combination of ‘sweep’ and ‘travel recce’ methods. This was preferred because, (‘Travel recce’ method relaxes the rules of a strict line transect by allowing deviations from the line of travel and for ease movement in difficult habitat and does not require measurement of the distance of signs from the line of travel of the observer (Kuhl et al., 2008). The ‘sweep survey’ methodology refers to a survey where observers move through an entire survey area at once (White and Edwards, 2000). Results of primate sightings are presented as an encounter rate defined as the average number of sightings of each species per kilometre of trail walked (Dunn, 2001-2003). Also, along each patrol trail, all wire snares; expended cartridges found were removed and all hunting and fishing camps found were dismantled. The SMART and Paste software were used for data analysis.

**RESULTS AND DISCUSSION**

About 18 recce surveys and 132 long-distance foot anti-poaching patrols were surveyed in the Oban Division of CRNP beginning from December, 2014 to December, 2017. Alongside patrol, 58 park Rangers were trained in the use of SMART to assist in the recce surveys and anti-poaching patrols. Using simple encounter rate, declines in hunting levels over the period of three year were recorded. It is obvious that human activity indices decrease with regular anti-poaching patrols and better Law Enforcement Monitoring from 2015 to 2017 (Tables 1 & 2).
Table 1: Comparison of Hunting and Human Activity Indices (HAI) 2015 to 2017

<table>
<thead>
<tr>
<th>Items</th>
<th>2015</th>
<th></th>
<th>2016</th>
<th></th>
<th>2017</th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Number of Observations</td>
<td>Encounter Rate per 10km</td>
<td>Number of Observations</td>
<td>Encounter Rate per 10km</td>
<td>Number of Observations</td>
<td>Encounter Rate per 10km</td>
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<tr>
<td>Expended Cartridges</td>
<td>2,952</td>
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<td>1,257</td>
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<td>472</td>
<td>0.174</td>
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<td>Gunshots Heard</td>
<td>26</td>
<td>0.001</td>
<td>12</td>
<td>0.003</td>
<td>21</td>
<td>0.008</td>
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<tr>
<td>Number of Hunting Camps Destroyed</td>
<td>94</td>
<td>0.003</td>
<td>50</td>
<td>0.013</td>
<td>15</td>
<td>0.006</td>
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<tr>
<td>Wire Snares removed</td>
<td>4,810</td>
<td>1.440</td>
<td>933</td>
<td>0.026</td>
<td>333</td>
<td>0.012</td>
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<tr>
<td>Total Distance Covered (km)</td>
<td>3,340.9 (km)</td>
<td></td>
<td>3,588.6 (km)</td>
<td></td>
<td>2717.5 (km)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Hunting trend 2015 to 2017

Also, to show hunting trend over time, Figure 1 showed the number of expended cartridges and wire snares removed from areas visited by survey and patrol teams in the line chart. The linear trend demonstrates a continual decline in hunting indices as patrol effort intensifies. In few years from now, it is optimistic that hunting will be brought to zero levels. However, to attain this, law enforcement project needs to be supported by a robust conservation education within and around the Oban hills communities.

Although estimate of the population of P. preussi could not be determined at this stage, however their presence and distribution have been confirmed in the Oban division of CRNP. From our findings, P. preussi is limited to the Ikpan forest block, up north of Ekonganaku and adjacent to Ekon1 village of Korup National Park in Cameroon, supporting (Oates, 2011 and Eniang, 2002). From the survey, the encounter rate of P. preussi was 0.001 over the period. With the maximum six individuals in the seven groups that were recorded over the period. Korup National Park in Cameroon houses majority of this species, estimated to be between 10,000 and 15,000 (Oates, 1996). There is urgent need for a conservation action plan to protect this species and its habitat in Nigeria, as well as promote transboundary conservation between Korup and Cross River National Park.

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Figure 2: Map of distribution of *P. preussi* in Nigeria

CONCLUSION

Based on our findings, there is still presence of *P. Preussi* in the Oban Division of Cross River National Park. Its distribution is limited to Oban East, specifically, the Ikpan forest block of the Park. Within a period of three year, our work focused on its survey as well as reducing hunting intensity and improving the conservation of *P. preussi* in the Oban Division of Cross River National Park, the last remaining patch of forest which is the only place in Nigeria where this species is found. We established a well supervised Law Enforcement Monitoring program to check patrol efficacy and report suggest that hunting levels decreases with regular patrol and in turn encounter rates of primate increases. Thus, it is possible that in the near future hunting level will drop further and more *P. preussi* encountered.
ACKNOWLEDGEMENT
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REFERENCES