



AFI MOUNTAIN WILDLIFE SANCTUARY ANNUAL REPORT: 2020



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Summary

This report presents results from ranger patrols of Afi Mountain Wildlife Sanctuary (AMWS) implemented from January to December 2020 with support from the Wildlife Conservation Society (WCS). It also describes activities implemented during the same period to raise levels of conservation awareness and improve local livelihoods. The results of law enforcement patrols in 2020 are compared to those from previous years (2011-2019) to evaluate the effectiveness of law enforcement action at the site. In 2020, a total of 66 patrols were completed covering 1,495 kilometers over 326 patrol days (1,914 patrol man-days). The patrols led to the arrest of 19 offenders including 15 hunters. A total of 2,405 wire snares were removed from the forest and 16 hunting camps were dismantled. In addition to hunting, farm encroachment and illegal logging are major threats at Afi. Seventeen logging sites and several farms were encountered by rangers during the patrols. Logging signs were most frequently encountered in the Katabang, Esekwe and Njua areas. Great apes were not sighted directly, but nine gorilla nest sites were observed. Direct animal sightings were rare but indirect signs were frequently observed. Large mammals most frequently sighted were blue duiker (*Philantomba monticola*), red river hog (*Potamochoerus porcus*) and brush-tailed porcupine (*Atherurus africanus*). Monkeys sighted include Mona monkey *Cercopithecus mona* (109 sightings), drill *Mandrillus leucophaeus* (117 sightings); and putty-nosed monkey *Cercopithecus nictitans* (61 sightings).

Despite Covid-19 restrictions, a number of activities were implemented to raise awareness and improve local livelihoods in the Cross River gorilla landscape. All education and livelihood activities were implemented in strict adherence to Covid-19 protocols put in place to ensure the health and safety of project staff and local communities. Activities implemented in the Cross River gorilla landscape to raise awareness include great ape film shows in 49 villages and two schools reaching 8,127 people in those communities, 28 school exchange visits, 28 field trips, 51 school visits and 80 community meetings. A total of 1,380 customized notebooks designed to promote conservation of Cross River gorillas and forest elephants were distributed in schools. Other activities implemented include celebration of World Pangolin Day, World Wildlife Day, and a teacher's workshop and seminar with schools in Busi.

Livelihood activities implemented during this reporting period include training of cocoa farmers in sustainable farming practices including soil fertility management, shade management, appropriate use of approved pesticides, as well as planting, replanting and farm diversification. A total of 176 farmers (125 male and 51 female) in Afi were trained and 3,750 improved cocoa seedlings purchased from the Cocoa Research Institute of Nigeria (CRIN) were provided to farmers to replant existing old and unproductive farms outside the sanctuary. In addition, WCS also trained women in sustainable bush mango harvesting, storage and marketing and supplied them with a total of 1,820 improved bush mango seedlings to plant on farms and other degraded areas to boost production and reduce pressure on the forest. To improve access to major markets, WCS is supporting the formation and registration of bush mango women's cooperatives and their subsequent registration with major bush mango markets within and outside Cross River State so that the groups can organize and sell their produce directly in those markets at better prices.

Introduction

Established in 2000, AMWS is managed by the Cross River State Forestry Commission (CRSFC). AMWS occupies about 100 km² in the northeastern part of Afi River Forest Reserve, which has a total area 380 km². The sanctuary includes both the Afi Mountain massif, a rugged hill range with five main peaks, and an extensive lowland area. AMWS is the western-most Cross River gorilla site and is home to about 10% of the total Cross River population. Levels of hunting and other human activities in the sanctuary are high due to previously poor levels of protection. WCS has supported conservation and research at Afi since 1996, focusing on gorilla monitoring and conservation education. In 2011 WCS expanded this project to include support for CyberTracker based law enforcement and protection by CRSFC rangers. In 2015, a SMART based law enforcement and protection program (<http://smartconservationtools.org/>) was initiated and transitioned to SMART in 2016. WCS has implemented a conservation education program in the Cross River gorilla landscape since 2011 to complement the existing law enforcement monitoring project there. The program focuses on increasing conservation awareness among communities surrounding the wildlife sanctuary and building local support for conservation. Focusing on cocoa farmers and women's groups, the project aims to improve local livelihoods by improving the productivity and sustainability of cocoa, a major source of income for local communities but also a major driver of deforestation in the region, and the sustainability of non-timber forest products harvesting and marketing. This report covers law enforcement, education and livelihood activities supported by WCS in AMWS during the period from January to December 2020.

Methods

Each day, two teams comprising six CRSFC rangers each, patrolled different areas of the sanctuary in order to maximize the area covered, but these camped together at night for better supervision by WCS staff. The teams searched areas where hunting activities were suspected or known to be relatively high based on information from informants and results of previous patrols. The patrols covered the Esekwe Camp, Nkayang-Kakubok, Njua, Base Camp, Olum, Kathe-Asuben-Katabang, Buanchor-Drill Ranch, and Ebakken-Boje-Asuben areas of the sanctuary. Valleys and areas around known access trails were targeted. Signs of human activity and large mammals were recorded using SMART. All detected wire snares and hunting camps were destroyed. Data were analyzed using SMART software.

Results

Patrol effort

Sixty-six patrols were completed over 1,914 patrol man-days covering a total distance of 1,494.9 kilometers (Figure 1; Table 1).

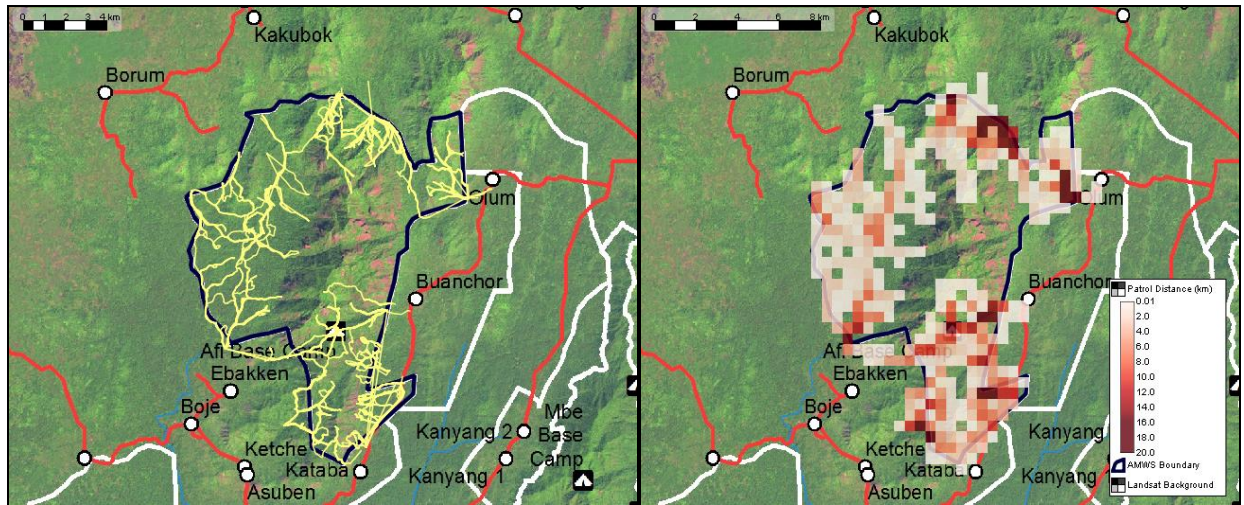


Figure 1. Patrol tracklogs and patrol effort in km walked per grid cell for the period January, to December, 2020. Darker red color indicates areas of more intense patrol coverage.

Table 1. Summary of patrol effort by patrol area for the period January to December, 2020.

Area	Number of Patrols	Patrol Days	Patrol Hours	Distance (km)	Person - Days
Base Camp	14	60	401.8	262.3	327
Buanchor-Drill Ranch	12	63	403.1	232.1	310
Ebakken-Boje-Asuben	1	6	30.6	41.9	30
Esekwe Camp	18	72	522.2	307.2	444
Katabang Axis	5	23	153.6	132.6	147
Ketye-Asuben	3	20	119.1	101.7	114
Njua Lowland	4	28	229.1	175.1	185
Nkanyang-Kakubo	3	20	189.7	86.8	129
Olum Axis	6	34	275.9	155.2	228
Total	66	326	2325.1	1,494.9	1,914

Average distance and length of patrols per month

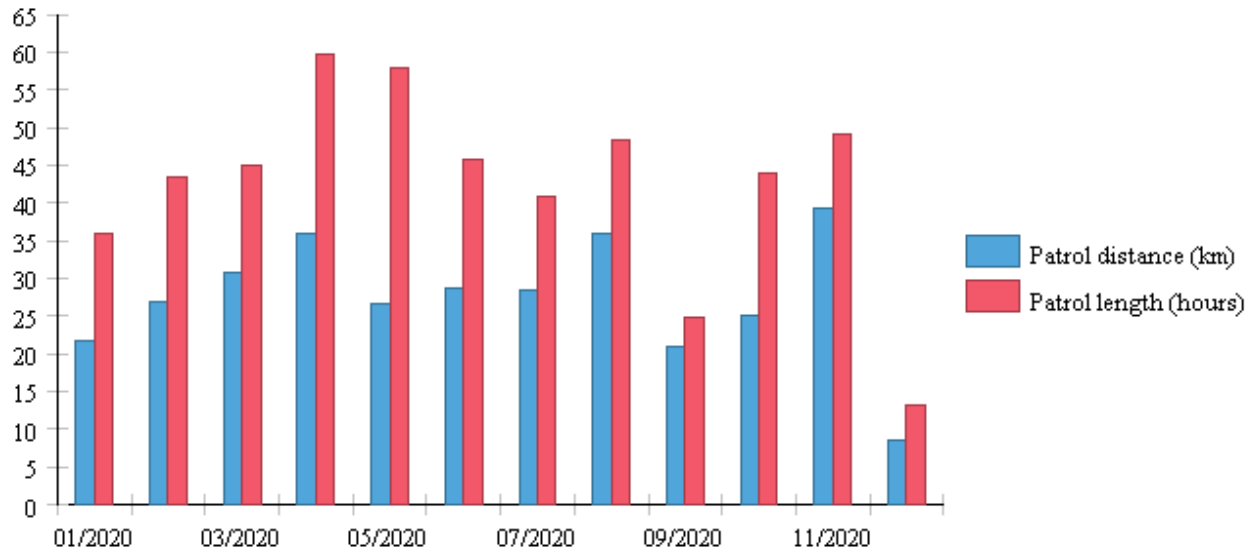


Figure 2. Average distance covered and time taken per patrol per month from January to December, 2020.

Total patrol distance and length per month

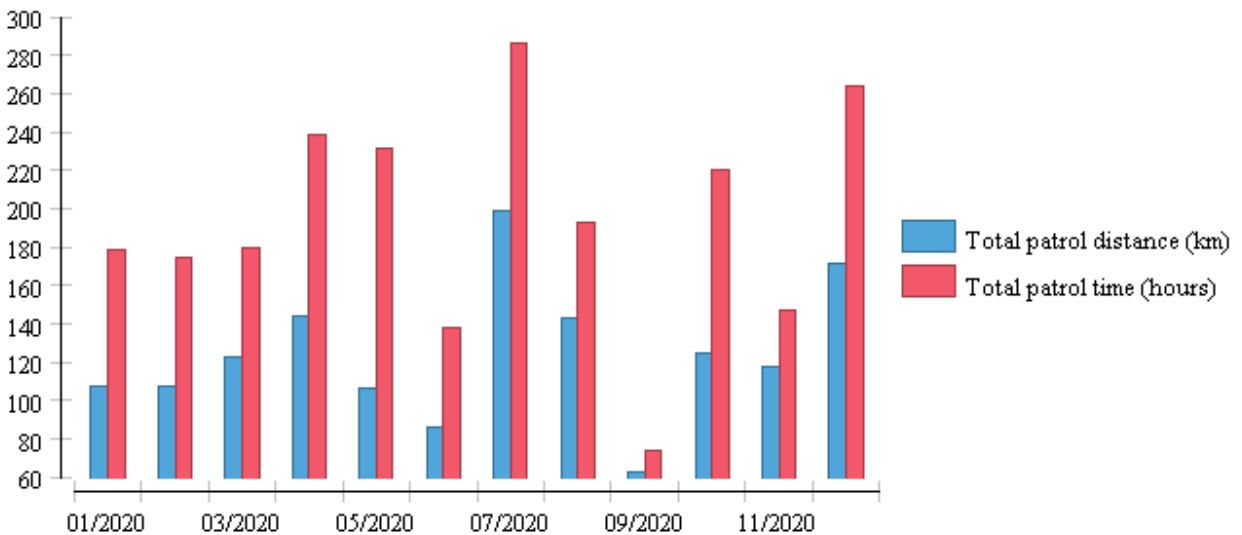


Figure 3. Total patrol distance and time per month from January to December, 2020.

Law enforcement

Encounter rate of wire snares and empty cartridges increased in 2020 compared to 2019, but remained similar for gunshots heard and hunting camps (see Table 2). Overall, encounter rate of most signs remained lower than in the 2012-2013 period.

Table 2. Comparison of hunting pressure in AMWS from 2012 to 2019

<i>Encounter rate per 10km</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>
Wire snares removed	20.7	16.8	9.7	5.3	6.4	8.3	5.9	10.0	16.1
Gunshots heard	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.5
Expended shotgun cartridges	4.3	1.0	1.6	1.9	1.6	2.2	2.8	2.0	2.7
Hunting camps destroyed	0.5	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1
Number of patrol days	285	315	303	353	347	488	303	308	326
Total distance covered	1,717	1,871	1,460	1,899	1,623	1,621	1,572	1732	1,495

Patrols this year led to the arrest of 19 offenders including 15 hunters (Table 3). Several small groups of people, as well as a larger group numbering over 20 were seen on farms inside the sanctuary. Arrested offenders were reported to the CRSFC for prosecution. However, none was prosecuted. The lack of prosecutions is negatively affecting morale of rangers among rangers who take great risks making arrests. The CRSFC needs to make efforts to improve prosecution rate to deter intending offenders.

Logging and farm encroachment are increasing threats at Afi encouraged by lack of political will and action by the CRSFC. Farms were seen frequently during the patrols and 17 logging sites and over 300 planks and other pieces of timber were sighted awaiting evacuation from the sanctuary. Illegal logging activities discovered by patrol teams are reported to the CRS Anti-Deforestation Task Force and the CRSFC for follow up action, but sadly, little or no action was taken.

Table 3. Summary of arrests and other law enforcement from January to December, 2020.

Station	Leader	Date	Action taken	Home Village	Name	Threat
Olum Axis	George Mgbang	Apr 25, 2020	Arrested	Buanchor	John Bette	Gun hunting
Olum Axis	George Mgbang	Apr 27, 2020	Observed only	Olum	Sabe Ochie	Farming
Esekwe Camp	George Mgbang	Apr 9, 2020	Observed only	Esekwe	Abuo Ofre	NTFP Collection
Esekwe Camp	George Mgbang	Apr 16, 2020	Observed only	Esekwe	Group of 21 farm workers	Farming
Esekwe Camp	George Mgbang	Apr 16, 2020	Observed only	Esekwe		Farming
Olum Axis	George Mgbang	Jul 25, 2020	Verbal warning	Olum		Farming
Esekwe Camp	George Mgbang	May 22, 2020	Arrested	Esekwe	Ferdinand Ashijua	Logging
Esekwe Camp	George Mgbang	May 23, 2020	Arrested	Cameroon	God Bless	Trapping
Esekwe Camp	George Mgbang	May 23, 2020	Arrested	Cameroon	Romanus Ekwa	Trapping
Njua Lowland	George Mgbang	Oct 26, 2020	Verbal warning	Njua	Ojie Asu	Farming
Katabang Axis	George Mgbang	Aug 13, 2020	Arrested	Cache Buje		Trapping
Katabang Axis	George Mgbang	Aug 17, 2020	Arrested	Katche Axis		Gun hunting
Njua Lowland	George Mgbang	Aug 28, 2020	Arrested	Njua	Daniel Ojie	Farming
Nkanyang-Kaku	George Mgbang	Jan 16, 2020	Unsuccessful pursuit	Kakwagom		Gun hunting
Nkanyang-Kaku	George Mgbang	Jan 16, 2020	Arrested	Kakwagom		Gun hunting
Nkanyang-Kaku	George Mgbang	Jan 15, 2020	Arrested	Kakubok	James ENu	Gun hunting
Nkanyang-Kaku	George Mgbang	Jan 15, 2020	Arrested	Kakubok	Jude Edor	Gun hunting
Nkanyang-Kaku	George Mgbang	Jan 15, 2020	Arrested	-	James Osan.	Trapping
Nkanyang-Kaku	George Mgbang	Jan 15, 2020	Arrested	Kakwagon	James Osang	Gun hunting
Nkanyang-Kaku	George Mgbang	Jan 15, 2020	Observed only	Kakubok		Farming
Nkanyang-Kaku	George Mgbang	Jan 21, 2020	Unsuccessful pursuit	Kakwagom Irruan	Oyibo Aggrey & Emenes	Trapping
Nkanyang-Kaku	George Mgbang	Jan 21, 2020	Arrested	Kakwagom		Trapping
Katabang Axis	George Mgbang	Jul 20, 2020	Arrested	Katabang	Adebayor	Logging
Katabang Axis	George Mgbang	Jul 20, 2020	Arrested	Katabang	Agbor Livinus	Logging
Esekwe Camp	Etta Joseph	Jun 6, 2020	Observed only			Gun hunting
Ketche-Asuben	David Otu	May 16, 2020	Observed only			Farming
Esekwe Camp	George Mgbang	Jan 29, 2020	Arrested	Bitiah	Sunday Atta	Gun hunting
Buanchor-Drill Ranch	Etta Joseph	Jun 25, 2020	Observed only			Fishing
Base Camp	Etta Joseph	Jan 25, 2020	Observed only	Boje		Burning
Base Camp	Etta Joseph	Jan 25, 2020	Observed only	Boje	unkouwing	Burning
Esekwe Camp	George Mgbang	Jan 27, 2020	Arrested	Kakwagom	Okpoma	Gun hunting
Esekwe Camp	George Mgbang	Jan 27, 2020	Arrested	Kakwagom	Bernard Obi	Trapping
Esekwe Camp	Etta Joseph	May 24, 2020	Observed only			Farming
Esekwe Camp	George Mgbang	Dec 9, 2020	Arrested	Bekpor	Bibang Diwa	Trapping
Nkanyang-Kaku	George Mgbang	May 18, 2020	Observed only	Kakubok		Farming

Table 4. Number of people seen by threat from January to December, 2020.

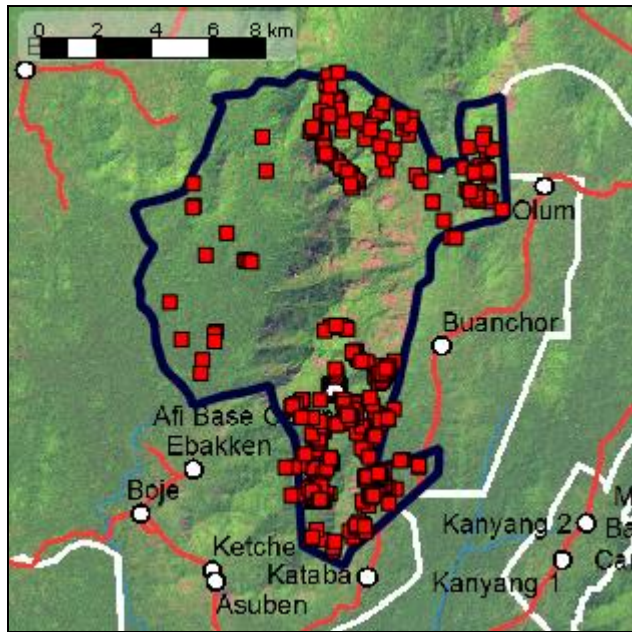
Threat	Number of People	Encounter Rate per km
Burning	2	0.001
Farming	10	0.007
Fishing	1	0.001
Hunting	18	0.012
Logging	3	0.002
NTFP Collection	1	0.001

Table 5. Total encounter rates of signs of human activity from January to December, 2020.

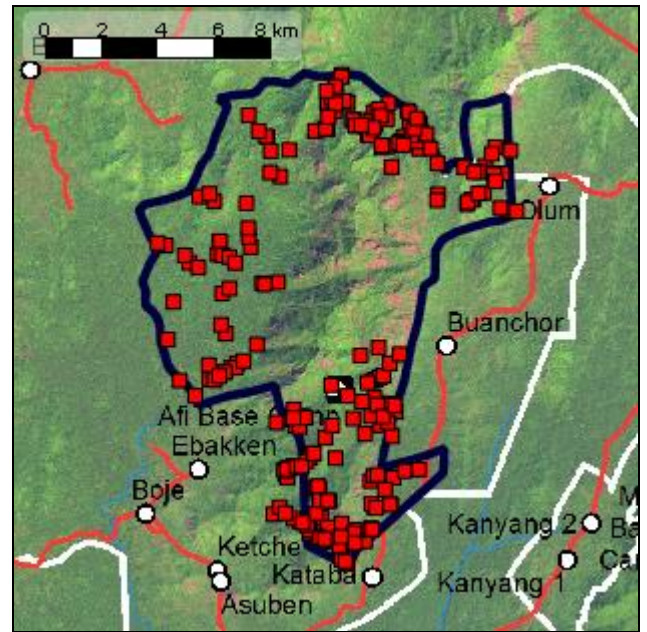
Activity	Number of Incidents	Encounter Rate per km
Farming and Land Clearing	88	0.059
Gunshot heard	56	0.037
Human Sign	123	0.082
Logging and Tree Cutting	17	0.011
People seen	35	0.023
Shed or Camp	33	0.022
Traps, Weapons & Equipment	893	0.597

Table 6. Specific evidence of logging from January to December, 2020.

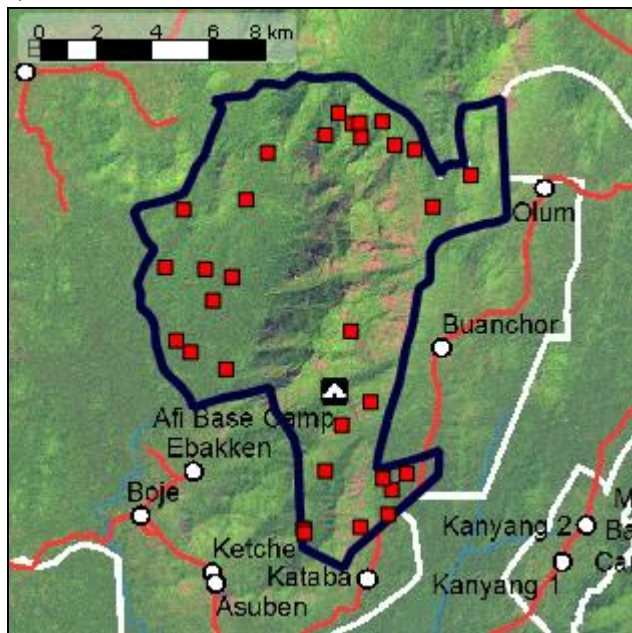
Type of logging evidence	Action Taken - Items	Age of Sign	Number of cut pieces	Number of Logs	Number of Planks	Number of Stumps	Tree Species
Logs	Destroyed	Fresh		7			Unknown
Stump	Seen Only	Recent				4	Other
Stump	Seen Only	Fresh				1	Iroko
Planks	Seen Only	Fresh			8		Iroko
Cut Pieces	Seen Only	Fresh	200				Other
Cut Pieces	Seen Only	Recent	4				Iroko
Logs	Seen Only	Recent		4			Unknown
Logs	Seen Only	Fresh		5			Unknown
Logs	Seen Only	Recent		4			Unknown
Planks	Seen Only	Recent			243		Mahogany
Stump	Seen Only	Fresh				1	Other
Cut Pieces	Seen Only	Fresh	12				Other
Logs	Destroyed	Fresh		2			Iroko
Stump	Seen Only	Fresh				1	Unknown
Logs	Destroyed	Fresh		2			Mahogany
Logs	Destroyed	Fresh		3			Iroko
Stump	Seen Only	Old				1	Other



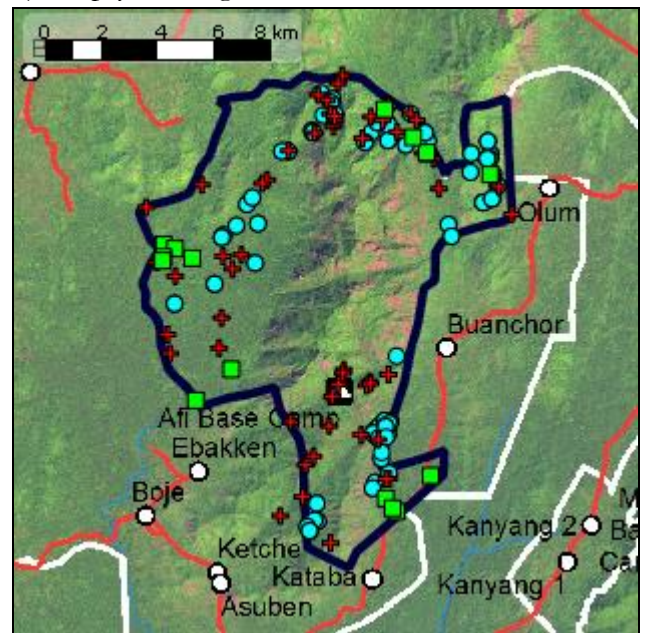
a) Wire snares



b) Empty cartridges



c) Sheds and camps



d) Farms (circles), gunshots heard (crosses), logging (squares)

Figure 4. Distribution of all signs of human activity recorded from period January to December, 2020

Table 7. Hunting signs recorded from January to December, 2020.

Sign	Number of Observations	Encounter Rate per km
Gunshots heard	56	0.037
Set wire snares	2405	1.609
Unset wire snares	3	0.002
Empty cartridges	401	0.268
Hunting camps	16	0.011

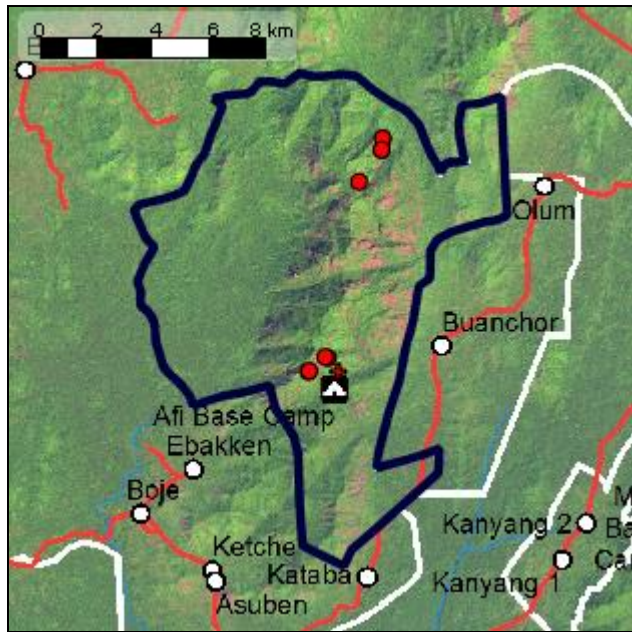
Poisoning of the Afi River for Fishing

In April, WCS received reports of poisoning of the Afi River by people from Abo-Obagante community. The reports were investigated and confirmed, and rangers were deployed to the river to arrest the culprits. Eight people were arrested and reported to the community as was existing community law prohibiting river poisoning for fishing. The community acted by fining the offenders Twenty Thousand Naira each as deterrent. The fines were paid to Abo Ogbagante community.

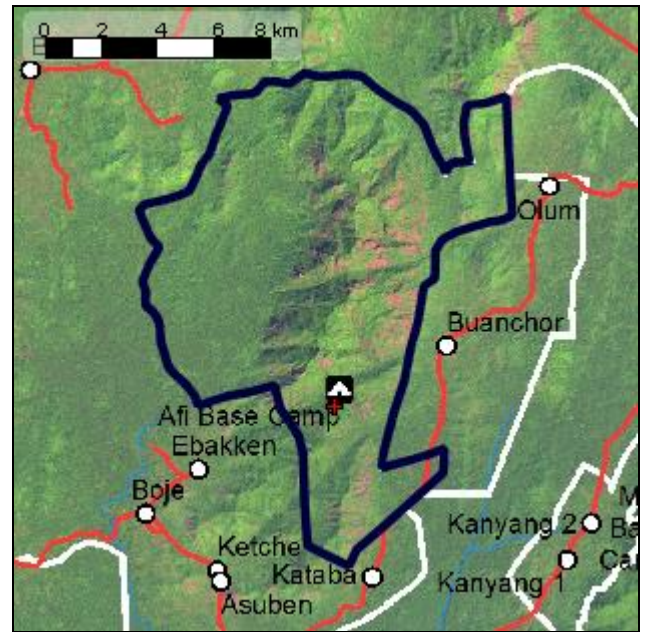
Wildlife Observations

Great Apes

Chimpanzees were sighted once in the area south of Base Camp. Gorillas were not sighted, but their vocalizations were heard just north of Base Camp. Nine gorilla nest sites were observed (Figure 5). Relatively few great ape observations, especially chimpanzee, were recorded this year. The reason for this is not clear but different factors could contribute including repeated incidents of wildfire during the dry months of the year that might have altered ranging pattern making tracking more challenging. Other factors that could be responsible include patrols focusing on dealing with farm encroachment and hunting with less attention to gorilla and chimpanzee tracking, and the “banning” of patrols for several months in the Esekwe axis of the sanctuary (a key part of the great ape range within the sanctuary) by the Esekwe community. We will keenly monitor the distribution and abundance of evidence in the sanctuary next year to get a better understanding the situation with the ape population in AMWS.



a) Gorillas



b) Chimpanzees

Figure 5. Ape sightings, vocalizations and nest sites recorded from January to December, 2020. Nest sites shown as circles, sightings and vocalizations shown as crosses.

Table 8. Number and encounter rate of nest sites recorded from January to December, 2020.

Species	Number of nest sites	Encounter rate of nest sites per km
Chimpanzee	-	-
Gorilla	9	0.006
Unidentified great ape	-	-

Table 9. Nest sites recorded from January to December, 2020.

Species	Nest site type	Age of Sign	Dung present	Number of ground nests	Total number of nests	Note
Gorilla	Night nest(s)	Recent	true	3		
Gorilla	Night nest(s)	Recent	true	2	2	
Gorilla	Night nest(s)	Recent	false	0	1	
Gorilla	Night nest(s)	Recent	true	0	2	
Gorilla	Day nest(s)	Old	true	8	8	
Gorilla	Night nest(s)	Fresh	true	1	3	
Gorilla	Night nest(s)	Fresh	true	3	5	
Gorilla	Night nest(s)	Recent	false	0	1	
Gorilla	Unknown	Old	false	2	4	

Monkeys sighted

Monkeys sighted during this period include Mona monkey (109 sightings), drill (117 sightings), and putty-nosed monkey (61 sightings). The largest estimated group size was 30 individuals. Mixed species groups were encountered.

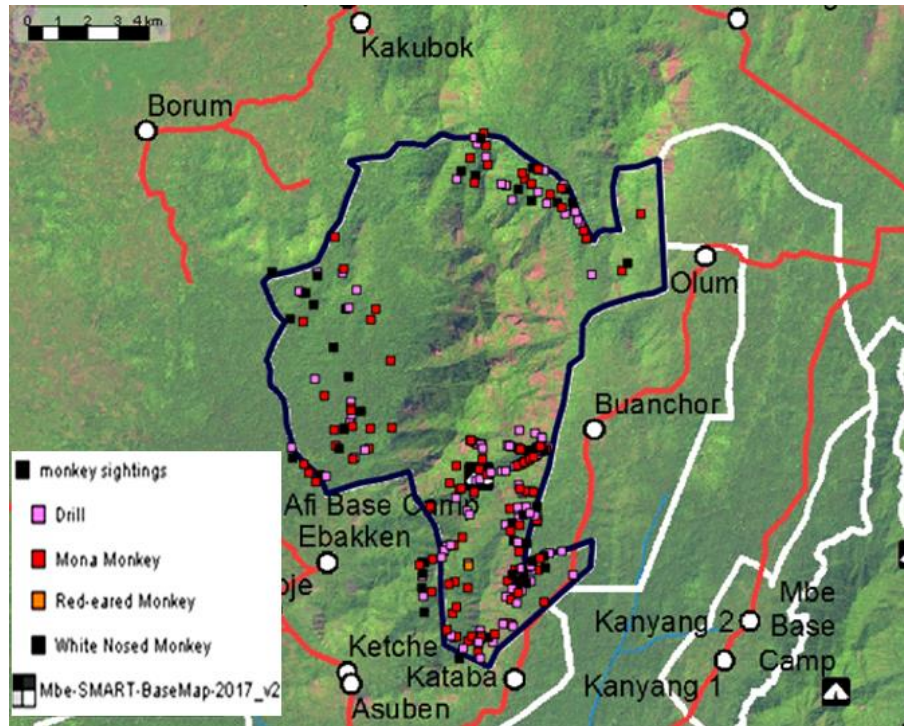


Figure 6. Monkey species observed from January to December, 2020.

Table 10. Number and encounter rate of monkey species recorded from January to December, 2020.

Species	Number of observations	Encounter rate per km
Drill	117	0.078
Mona monkey	109	0.073
Red-eared monkey	1	0.001
White-nosed monkey	61	0.041

Other Wildlife

Direct animal sightings were rare. Species sighted frequently include blue duiker (*Philantomba monticola*), red river hog (*Potamochoerus porcus*) and brush-tailed porcupine (*Atherurus africanus*). See Appendix II for encounter rates of all species recorded.

Conservation Education and Awareness

Community meetings

WCS and the CRSFC held meetings with Esekwe, Olum, and Kakubok communities to address threats and attacks on rangers by youths of the three communities who also denied the rangers access to the sanctuary for patrols. The meetings were successful as all issues were resolved and patrols have continued unhindered. Building on the outcomes of these meetings, a meeting of all AMWS communities and the CRSFC and WCS was organized to discuss ways to reduce threats to AMWS and improve the conservation of the sanctuary. The meeting took place on the 19th of September 2020 at the Palace of the Paramount Ruler of Boki. The meeting was attended by chiefs, youth leaders, women leaders, and community chairmen from 8 sanctuary communities and representatives of the Cross River State Forestry Commission, Cross River State Tourism Bureau, and Wildlife Conservation Society. The meeting focused on seeking community support for the management of AMWS. Resolutions of the meeting include:

1. All illegal activities in the sanctuary, including farming, logging, trapping and gun hunter should be stopped immediately. Anybody caught should be made to face the community and government laws.
2. Communities should develop bylaws and sanctions that will protect the sanctuary; WCS and CRSFC can assist in achieving this.
3. Forest Management Committees should be revived to support the management of the sanctuary.
4. Rangers should be given adequate support by communities and WCS and CRSFC should provide the rangers with field equipment and other support to facilitate their work.
5. Next meeting should bring about the rebirth of the Afi Landlord Communities Association.
6. The AMWS landlord communities meeting should be held regularly and communities should always endeavor to send representatives.

Meeting with the Executive Chairman, Boki Local Government Council

During the period, the WCS Afi project manager and some Afi rangers met with the Executive Chairman of Boki Local Government Council in Boje, Pastor John Ewa, to brief him of ongoing efforts by the Cross River State Forestry Commission and WCS to improve the conservation of Afi Mountain Wildlife Sanctuary and to seek the support of the council. In his response, the Chairman appreciated the efforts of WCS and sued for greater commitment from all stakeholders to the conservation of the sanctuary despite the many challenges. In particular, he appealed for greater support from the surrounding communities, and pledged the council's support in any areas possible.

Farms Encroachment

This year's farming season came with several new farms appearing in the sanctuary, mostly around Esekwe, Njua, Kakubok, Kathe and Olum. Communities having farms inside the sanctuary were encouraged to prevail on their members to stop encroaching on the sanctuary. A list of identified farmers who established new farms in the sanctuary was handed to the CRSFC's Boje Forest Officer and the Zonal Forest Officer who submitted same to the Divisional Police Office in Okundi for arrest and prosecution. Only two of the defaulters were arrested, but released on bail without prosecution. A visit was also made to the Divisional Police Officer in Okundi to seek the support of the Police in dealing with perpetrators of illegal activities in the sanctuary.

During the year, there were cases of fire incidents around the sanctuary. most of the farms in and around the sanctuary boundaries in Kakubok, Boje, Buanchor and Esekwe were affected. The rangers were directly involved in arresting the fire outbreak in Boje and Buanchor axis, fire tracing was carried out in strategic areas within and around the sanctuary boundaries. With this, there is need for deliberate sensitization in the surrounding communities to avoid future recurrence.

COVID 19 Awareness Campaign

WCS printed and distributed COVID-19 awareness posters developed by the Nigeria Center for Disease Control (NCDC) in communities around AMWS to raise awareness of the pandemic and encourage people to adopt NCDC approved guidelines to prevent or reduce the spread of the virus in the communities.

World Rangers Day Celebration

World Ranger Day is celebrated worldwide on July 3 to recognize the work that rangers do to protect wildlife and wild places. It is also a day to commemorate Rangers killed or injured during the course of their work. At Afi, a walk by rangers with placards bearing conservation messages was organized to mark the day, with stopover at strategic locations in the community during the walk to talk to people about the work rangers do, why they do it, and the need for communities to support rangers. The rangers also visited traditional institutions within the communities to canvass support for their work.

Support to Improve Local Livelihoods

Implementation of this activity was delayed by Covid-19 restrictions and was only started in August 2020 after when adequate measures and protocols were put in place to safely implement the activity. To establish a baseline of household wellbeing for monitoring the impact of the intervention, we conducted a Basic Necessities Survey (BNS) of households in target communities across the Cross River gorilla landscape. A total 378 households were surveyed. The BNS is an indirect method of measuring poverty that is simple to design and implement, democratic in the way that it identifies what constitutes poverty and who is poor, and rights-based in its emphasis on entitlement. The BNS combines two aspects of people's lives – their material conditions, and their perceptions of these material conditions – both of which have consequences for the quality of their lives.

Livelihood activities implemented during this reporting period include training of cocoa farmers in sustainable farming practices including soil fertility management, shade management, appropriate use of approved pesticides, as well as planting, replanting and farm diversification. One hundred and seventy-six farmers (125 male and 51 female) were trained in Afi (Table 11) and supplied with improved cocoa seedlings purchased from the Cocoa Research Institute of Nigeria (CRIN) were provided to the farmers to replant existing old and unproductive farms outside protected areas.

Table 11. Training attendance disaggregated by gender

S/N	Community	Male	Female	Total
1	Enyi	15	6	21
2	Ebok-Ebakken	13	9	22
3	Ebbranta	13	9	22
4	Kachie	15	5	20
5	Asuben	17	2	20
6	Nkanya	11	11	22
7	Okubuchi	20	5	25
8	Ndemechang	18	6	24

With improved cocoa pods acquired from the Cocoa Research Institute of Nigeria (CRIN), WCS established six community cocoa nurseries that are expected to produce around 60,000 improved cocoa seedlings each year for distribution to trained farmers to replant old, unproductive farms to improve productivity and reduce deforestation from clearing forest for farm expansion. The CRIN TC hybrid variety which we are using to establish the nurseries is early bearing, high yielding with very low input, resistant to major pests and diseases of cocoa, highly adaptable to cocoa ecologies of Nigeria, and has very good cocoa quality traits. The seedlings are expected to be ready for distribution in July 2021. All beneficiaries will sign a conservation contract and all farms to be planted will mapped and monitored to ensure compliance with the terms of agreement of the support. In 2021, we will organize more training for farmers on sustainable farming practices and each farmer supported by the project will sign a conservation contract to ensure that all farmers apply best practices that reduce

deforestation and save critical habitat for gorillas, chimpanzees, forest elephants and other endangered species.

Training was also organized for women groups in sustainable bush mango harvesting and marketing to improve income, and 1,820 improved bush mango seedlings distributed to women in 5 communities including Kachie, Enyi, Ebranta, Ebok and Kakubok for planting on existing farms.

Recommendations

- The lack presence of the CRSFC on the ground at Afi weakens law enforcement efforts, and may be one of the reasons why law enforcement activities are being resisted by communities.
- Lack of prosecutions of arrested defaulters is encouraging communities to perpetrate illegal activities in the sanctuary. The CRSFC should take action to and prosecute arrest offenders.
- Decisive action is needed to deal with the problem of farm encroachment at Afi. Numerous farms were seen in the sanctuary during patrols this year.
- There is need to have a camp (permanent or temporary) in the Kakubok axis of the sanctuary to deal with the increasing illegal activities in the area.
- Regular meetings between stakeholders increasing the CRSFC, Ministry of Climate Change, Boki LGA, communities around AMWS is encouraged to generate interest and support.
- The existing synergy between the WCS law enforcement, education and livelihood teams should be strengthened and sustained.
- The sanctuary boundary should be cleared regularly to facilitate law enforcement, as most people seen in the sanctuary claimed ignorance of the sanctuary boundary, which is overgrown in many places.
- In addition to clearing, signposts should be placed at strategic locations along the boundary with information on prohibited activities to reduce illegal activities.
- Prosecution is key to reducing illegal logging in and around the sanctuary. The CRSFC should arrest and prosecute defaulters to discourage illegal logging.
- Forestry checkpoints on the roads should be complimented with having field staff within logging hotspots in the sanctuary to compliment the work of rangers.
- The Boje forest office that was moved from Boje to Ntamante during the Boje crisis with Eso-Bendeghe should be moved back to Boje as peace has been restored.

Acknowledgements

We are grateful to the Great Ape Conservation Fund of the United States Fish and Wildlife Service who have constantly provided financial support to the WCS Nigeria program. We also appreciate the funding from the Kolmården Zoo, AZA, Zoo New England, Dutch Gorilla Foundation, the Critical Ecosystem Partnership Fund (CEPF), and North Carolina Zoo. We also wish to acknowledge the efforts of all the Afi rangers, particularly the Community Rangers who have endured and kept patrols going to date despite being owed several years of salary by the Cross River State Government. WCS is formally registered in Nigeria through an agreement with the Ministry of Budget and National Planning of the Federal Republic of Nigeria. The Government of Cross River State is also highly appreciated for giving WCS the enabling environment to operate. WCS works at Afi Mountain Wildlife Sanctuary in collaboration with the Ministry of Climate Change and Forestry and the Cross River State Forestry Commission.

Photos



Plate 1: Rangers day celebration



Plate 2: Community meeting



Plate 3&4: Confiscated Chainsaw and the logging site in the sanctuary



Plate 5&6: Forest affected by fire in AMWS

Rangers creating firebreak in AMWS

Appendix I. Patrol effort statistics from January to December, 2020.

Date	Number of Patrols	Distance (km)	Number of Hours	Number of Rangers
2020-01-15	2	7.4	13.8	11
2020-01-16	2	10.2	15.6	12
2020-01-17	2	10.7	13.6	12
2020-01-18	2	7.3	14.6	12
2020-01-19	2	5.5	16.2	12
2020-01-20	2	8.5	17.6	12
2020-01-21	2	8.7	16.4	12
2020-01-22	2	6.4	11.7	12
2020-01-25	2	4.2	9.3	13
2020-01-26	2	9.6	11.3	13
2020-01-27	2	10.5	12.1	13
2020-01-28	2	8.6	11.3	13
2020-01-29	2	10.4	15.7	13
2020-02-12	2	7.5	12.0	12
2020-02-13	2	8.3	11.8	12
2020-02-14	2	8.5	18.8	12
2020-02-15	2	7.2	11.3	12
2020-02-16	2	9.4	21.5	12
2020-02-17	2	9.6	13.0	12
2020-02-18	2	5.5	12.3	12
2020-02-19	2	8.1	11.7	12
2020-02-22	2	8.5	12.2	12
2020-02-23	2	8.7	13.0	12
2020-02-24	2	11.0	13.5	12
2020-02-25	2	9.1	12.6	12
2020-02-26	2	6.1	10.4	12
2020-03-11	2	12.1	14.1	11
2020-03-12	2	9.7	12.3	13
2020-03-13	2	8.3	12.3	13
2020-03-14	2	7.7	11.5	13
2020-03-15	2	8.9	11.2	13
2020-03-16	2	10.2	12.1	13
2020-03-17	2	8.1	12.2	13
2020-03-18	2	9.5	12.5	13
2020-03-21	2	9.1	14.9	13
2020-03-22	2	7.4	13.6	13
2020-03-23	2	9.7	13.2	13
2020-03-24	2	8.1	13.5	13
2020-03-25	2	6.2	14.1	12
2020-03-26	2	8.1	11.8	13

Date	Number of Patrols	Distance (km)	Number of Hours	Number of Rangers
2020-04-09	2	10.5	14.4	12
2020-04-10	2	9.1	12.9	11
2020-04-11	2	10.0	16.1	12
2020-04-12	1	2.7	5.9	7
2020-04-13	2	10.7	14.8	11
2020-04-14	2	8.8	12.5	12
2020-04-15	2	12.2	12.5	12
2020-04-16	2	12.4	11.0	12
2020-04-17	1	5.6	5.7	5
2020-04-20	2	6.1	12.4	12
2020-04-21	2	8.8	23.8	12
2020-04-22	2	8.3	23.8	12
2020-04-23	2	10.5	15.8	12
2020-04-24	2	6.7	14.0	12
2020-04-25	2	6.9	16.2	12
2020-04-26	2	7.6	15.2	12
2020-04-27	2	6.8	11.5	12
2020-05-12	1			7
2020-05-13	2	6.1	30.3	12
2020-05-14	2	9.9	30.1	12
2020-05-15	2	7.9	23.0	12
2020-05-16	2	9.9	15.4	12
2020-05-17	2	9.5	14.4	12
2020-05-18	2	10.5	13.8	12
2020-05-22	2	7.9	14.8	13
2020-05-23	2	10.4	16.9	11
2020-05-24	2	7.4	13.8	13
2020-05-25	2	7.1	14.9	13
2020-05-26	2	6.4	15.5	13
2020-05-27	2	7.0	15.9	13
2020-05-28	2	6.9	13.0	13
2020-06-04	1	4.5	15.4	5
2020-06-05	1	3.9	11.2	5
2020-06-06	1	2.6	8.0	5
2020-06-07	1	5.4	6.5	5
2020-06-08	1	9.1	6.9	5
2020-06-09	1	6.4	8.4	5
2020-06-10	1	7.1	9.1	5
2020-06-11	1	3.5	6.6	5
2020-06-16	1	4.1	4.9	5

Date	Number of Patrols	Distance (km)	Number of Hours	Number of Rangers
2020-06-17	1	3.4	8.5	5
2020-06-18	1	3.8	7.1	5
2020-06-19	1	6.4	6.5	5
2020-06-20	1	4.2	5.1	5
2020-06-21	1	4.3	5.8	5
2020-06-25	1	4.4	6.4	5
2020-06-26	1	3.2	5.4	5
2020-06-27	1	3.3	5.9	5
2020-06-28	1	2.7	5.6	5
2020-06-29	1	3.8	4.2	5
2020-07-03	1	3.0	5.8	5
2020-07-04	2	7.9	15.4	9
2020-07-05	2	7.2	14.2	11
2020-07-06	2	8.8	12.2	11
2020-07-07	2	7.3	14.8	11
2020-07-08	2	6.7	15.3	11
2020-07-09	2	10.9	13.7	11
2020-07-10	1	4.0	7.7	6
2020-07-14	2	12.0	11.0	13
2020-07-15	2	8.7	13.1	13
2020-07-16	2	10.8	8.5	13
2020-07-17	2	8.2	16.8	12
2020-07-18	2	8.0	12.1	13
2020-07-19	2	13.1	11.7	13
2020-07-20	2	6.6	20.8	13
2020-07-21	1			5
2020-07-22	1			5
2020-07-23	1			5
2020-07-24	3	15.2	24.6	13
2020-07-25	2	11.4	15.1	13
2020-07-26	2	11.0	15.0	13
2020-07-27	2	12.3	12.1	13
2020-07-28	2	13.8	14.3	13
2020-07-29	2	12.1	11.7	13
2020-08-13	2	9.6	11.9	12
2020-08-14	2	9.5	12.8	12
2020-08-15	2	10.6	13.1	12
2020-08-16	2	9.4	12.8	12
2020-08-17	2	10.0	11.4	12
2020-08-18	2	11.2	8.1	12

Date	Number of Patrols	Distance (km)	Number of Hours	Number of Rangers
2020-08-23	2	10.6	12.8	12
2020-08-24	2	10.2	12.3	12
2020-08-25	2	12.6	14.8	12
2020-08-26	2	10.0	13.6	12
2020-08-27	2	10.9	22.3	12
2020-08-28	2	7.6	24.4	12
2020-08-29	2	12.2	11.3	12
2020-08-30	2	8.9	11.4	12
2020-09-11	1	4.7	4.6	5
2020-09-12	1	3.6	6.0	5
2020-09-13	1	4.4	6.3	5
2020-09-14	1	2.7	5.5	5
2020-09-15	1	3.2	4.9	5
2020-09-16	1	2.1	4.0	5
2020-09-17	1	3.4	4.7	5
2020-09-18	1	2.4	2.9	5
2020-09-22	1	5.0	5.8	5
2020-09-23	1	5.5	5.2	5
2020-09-24	1	6.0	4.9	5
2020-09-25	1	5.6	6.1	5
2020-09-26	1	5.4	4.8	5
2020-09-27	2	8.6	8.4	9
2020-10-14	2	9.0	17.9	11
2020-10-15	2	10.0	15.1	11
2020-10-16	2	11.1	15.4	11
2020-10-17	2	5.7	17.4	11
2020-10-18	2	7.7	14.1	11
2020-10-19	2	7.8	17.8	11
2020-10-20	2	8.2	16.0	11
2020-10-21	2	9.3	13.0	12
2020-10-26	2	9.9	13.4	13
2020-10-27	2	13.6	14.1	13
2020-10-28	2	8.8	15.6	12
2020-10-29	2	8.2	19.3	12
2020-10-30	2	7.5	18.1	13
2020-10-31	2	7.9	12.9	13
2020-11-04	1	4.4	6.5	5
2020-11-05	1	12.0	9.1	5
2020-11-06	1	3.6	7.3	5
2020-11-07	1	6.0	6.6	5

Date	Number of Patrols	Distance (km)	Number of Hours	Number of Rangers
2020-11-08	1	3.1	7.5	5
2020-11-09	1	7.5	7.7	5
2020-11-10	1	8.0	8.4	5
2020-11-11	1	2.0	7.5	5
2020-11-16	1	6.0	7.3	5
2020-11-17	1	7.1	5.3	5
2020-11-18	1	6.1	8.7	5
2020-11-19	1	5.2	7.2	5
2020-11-20	1	4.0	5.8	5
2020-11-21	1	4.1	5.2	5
2020-11-24	1	8.4	7.3	5
2020-11-25	1	8.2	7.1	5
2020-11-26	1	7.1	8.6	5
2020-11-27	1	5.7	10.3	5
2020-11-28	1	3.7	6.5	5
2020-11-29	1	5.8	7.0	5
2020-12-05	2	9.7	13.7	11
2020-12-06	2	6.6	12.3	11
2020-12-07	2	11.2	15.1	11
2020-12-08	2	9.5	17.5	12
2020-12-09	2	8.0	16.5	11
2020-12-10	2	7.0	15.8	11
2020-12-11	2	9.3	15.1	11
2020-12-12	2	8.5	12.7	11
2020-12-17	2	8.6	10.4	11
2020-12-18	2	14.1	13.0	11
2020-12-19	2	8.4	16.4	11
2020-12-20	2	7.1	15.0	11
2020-12-21	2	9.7	14.2	11
2020-12-22	2	10.0	13.8	11
2020-12-24	1	10.9	6.9	7
2020-12-27	2	10.8	15.4	11
2020-12-28	2	11.3	14.2	11
2020-12-29	2	4.6	14.7	11
2020-12-30	2	6.2	11.7	12

Appendix II. Encounter rate of wildlife species observed during patrols from January to December, 2020. Species not encountered during patrols are not shown.

Species	Number of observations	Encounter rate per km
Blue duiker	<i>Philantomba monticola</i>	1.123
Red river hog	<i>Potamochoerus porcus</i>	0.783
Brush-tailed porcupine	<i>Atherurus africanus</i>	0.713
Drill	<i>Mandrillus leucophaeus</i>	0.652
Mona monkey	<i>Cercopithecus mona</i>	0.462
Unidentified monkey	-	0.416
Common mongoose	<i>Crossarchus sp-</i>	0.361
Hornbill	-	0.278
Putty nosed monkey	<i>Cercopithecus nictitans</i>	0.266
Turaco	-	0.254
Yellow-backed duiker	<i>Cephalophus silvicultor</i>	0.221
Bay duiker	<i>Cephalophus dorsalis</i>	0.167
Unidentified medium duiker	-	0.106
Cane rat	<i>Thryonomys swinderianus</i>	0.084
Tree pangolin	<i>Phataginus tricuspis</i>	0.083
African civet	<i>Civettictis civetta</i>	0.071
Unidentified large duiker	-	0.056
Unidentified small duiker	-	0.054
Nigeria-Cameroon chimpanzee	<i>Pan troglodytes ellioti</i>	0.047
Rock fowl	<i>Picathartes oreas</i>	0.033
Cross River gorilla	<i>Gorilla gorilla diebli</i>	0.029
African palm civet	<i>Nandinia binotata</i>	0.018
Unidentified great ape	-	0.013

Appendix III. Ranger work time from January to December, 2020.

Name	Number of Patrols	Number of Patrol Days	Number Patrol Hours	Total Patrol Distance (km)
Alphonsus Oweh	14	88	684.5	411.4
Anthony Osang	36	189	1256.8	862.9
Bernard Akpa	20	74	576.1	376.2
David Otu	36	189	1256.8	862.9
Donald Ojie	38	198	1355.7	926.3
Drew Cronin	1	1	8.2	3.6
Duke Ofre	1	3	29.9	13.2
Esekwe Gorilla Guardian	3	3	21.3	18.2
Etta Joseph	36	188	1251.5	859.4
Fidelis Osang	1	1	5.3	3.5
George Mgbang	30	137	1068.3	631.8
Henry Achua	17	103	809.3	475.5
Katabang Gorilla Guardian	13	33	255.7	156.5
Olum Gorilla Guardian	12	32	248.0	151.2
Patrick Bankong	17	102	787.9	465.9
Patrick Kejie	36	186	1242.7	854.2
Peter Adie	2	2	8.6	4.5
Peter Nsan	17	103	809.3	475.5
Philip Ashijua	30	136	1057.6	623.5
Victor Agbor	4	26	171.5	115.3
Vincent Ayang	29	120	938.5	541.1

