CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Seventy-seventh meeting of the Standing Committee
Geneva (Switzerland), 6–10 November 2023

Species conservation and trade

Fauna

GREAT APES (HOMINIDAE SPP.): REPORT ON THE IMPLEMENTATION OF RESOLUTION CONF. 13.4 (REV. COP18)

1. This document has been prepared by the Secretariat, in consultation with the Great Apes Survival Partnership (GRASP) and the Section on Great Apes (SGA) of the International Union for Conservation of Nature (IUCN) Species Survival Commission (SSC) Primate Specialist Group.

Background

2. Resolution Conf. 13.4 (Rev. CoP18) on *Conservation of and trade in great apes* directs the Secretariat to report to the Standing Committee on the implementation of the Resolution at each of its regular meetings; and directs the Standing Committee to review the implementation of the Resolution at each of its regular meetings on the basis of the Secretariat's reports and report at each meeting of the Conference of the Parties with any recommendations for further action.

3. Seven species of great apes (Hominidae spp.) are included in CITES Appendix I: *Gorilla beringei* (Eastern gorilla), *Gorilla gorilla* (Western gorilla), *Pan troglodytes* (chimpanzee), *Pan paniscus* (bonobo), *Pongo abelii* (Sumatran orangutan), *Pongo pygmaeus* (Bornean orangutan) and *Pongo tapanuliensis* (Tapanuli orangutan).

Great Apes Survival Partnership (GRASP)

4. In paragraph 4 of the Resolution, the Secretariat, the Standing Committee and the Animals Committee are urged to work closely with GRASP (Great Apes Survival Partnership), which is an alliance of over 100 national governments, conservation organizations, research institutions, United Nations agencies and private companies, committed to ensuring the long-term survival of great apes and their habitats in Africa and Asia. An update on GRASP and SGA activities in 2022 relevant to the implementation of Resolution Conf. 13.4 (Rev. CoP18) is attached as Annex 1 to this document (see also information document CoP19 Inf. 61). Activities reported on include initiatives to conserve the habitat of great apes; information systems that facilitate the monitoring of changes in great ape population trends and in ape population status, threats, conservation activities; and research activities as well as regional conservation action plans.

5. The CITES Secretariat currently participates as one of two intergovernmental organizations, along with the Secretariat of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), in the GRASP Executive Committee. The last physical meeting of the Committee was held at UNESCO in Paris in 2019. COVID-19 related restrictions did not allow for a physical meeting in 2020 and 2021. It has not been possible to hold any GRASP decision-making meetings online since the 18th meeting of the Conference of the Parties (CoP18; Geneva, 2019) due to technical difficulties faced by African range States in participating in online meetings. The next GRASP Executive Committee meeting will be held in early October 2023; and the Secretariat will provide an oral update on the outcomes at the present meeting.

6. The last GRASP Council meeting was held back in 2012; and the next council meeting is scheduled to take place back-to-back with the CMS gorilla agreement meeting from 11 to 15 December 2023 at the UNESCO headquarters in Paris. An independent consultant will conduct a review of the GRASP partnership in preparation of the council meeting.

7. GRASP maintains the Apes Seizures Database, a collation of seizure data on great apes and great ape parts and derivatives that is validated by a panel of great ape experts to ensure the high quality of data being added into the system. Seizure data comes from GRASP's broad alliance of national governments, research institutions, conservation organizations and United Nations agencies. Those who want to submit data can access the database directly and use a bulk upload function, after which data are validated by an expert panel and finally added to the dataset. The database is updated continuously, with hundreds of new records received since the GRASP and SGA report to the 70th meeting of the CITES Standing Committee (SC70; Sochi, October 2018) in the Annex to document SC70 Doc. 52. Illegal trade data are sensitive, and the database was thus created under the principle that raw data remain confidential and therefore not publicly available. GRASP makes public only the results of a meta-analysis where events cannot be traced back to the data submitters. Parties are invited to submit data per Resolution Conf. 13.4 (Rev. CoP18).

8. The Secretariat, under the CITES Monitoring the Illegal Killing of Elephants (MIKE) programme, is working closely with GRASP to implement Component 2 of the GEF-7 funded project "Transformational Change in Sustainable Forest Management in Transboundary Landscapes of the Congo Basin". The main objective of the project is "to catalyse transformational change in sustainable forest management in transboundary landscapes by scaling best practices and innovations at a regional level". The component of the project that the MIKE programme unit is implementing aims to improve the monitoring of illegal killing of elephants across the Congo basin and address key law enforcement needs at the national and subregional level, through focused training and capacity-building interventions. The project was initiated in April 2022 and will end in December 2025. Recent activities include a subregional meeting of the CITES MIKE steering committee meeting held in Bangui from 17 to 19 October 2022; training sessions on collection of elephant mortality data and operations to combat wildlife crime were conducted at two MIKE sites in Congo: Nouabale Ndoki National Park and Odzala Kokoua National Park; and ongoing discussions concerning possible collaborations with Garoua Wildlife College in Cameroon and UNODC to support crime scene management and other specialized training in central Africa.

Illegal trade in great apes as reported by CITES Parties

9. The levels of illegal trade in great ape species as reported in the CITES annual illegal trade reports is summarized in the table presented in Annex 2 to the present document. The number of seizures reported in 2016 was 10; 11 in 2017; 12 in 2018; 13 in 2019, 7 in 2020, 5 in 2021 and 2 in 2022. Several Parties have not reported seizures to the species level. This may not always be possible, particularly when traded as meat (MEA). The volume of each seizure remains low, with the exception of two seizures: One seizure of 30 individuals of *Pan troglodytes* reported in 2017 by Guinea and another seizure of 17 live specimens indicated as *Pan* spp. reported by Turkey in 2020. It is not known if the specimens refer to *Pan paniscus* (bonobo) or *Pan troglodytes* (chimpanzee).

Seizure data from other available sources

10. Other sources indicate that illegal trade in great apes remains a concern. For example, at the 19th meeting of the Conference of the Parties (CoP19; Panama City, 2022), the United States of America submitted an information document (CoP19 Inf. 85) concerning ongoing illegal trade in African great apes, including parts and derivatives thereof. The document claims that "Bushmeat, including meat of primates, has long been seized at U.S. and European airports. For example, a study sequencing the DNA of confiscated passenger-carried packages and shipments at JFK airport in the United States identified chimpanzees and other primate species[1]. Such seizures continue. In early 2022, U.S. Customs and Border Protection seized primate meat from a passenger's personal accompanied baggage at Saint Paul International Airport[2]." This information is yet to be included in the CITES annual illegal trade database.

11. Operation Thunder 2022, a month-long global operation targeting wildlife crime led jointly by INTERPOL and the World Customs Organization (WCO) in October 2022, brought together police, customs, financial intelligence units, wildlife and forestry enforcement agencies from 125 Parties (the largest number of Parties

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[1] *Nuwer, R. The New York Times (2012, January 13) From the Jungle to J.F.K., Viruses Cross Borders in Monkey Meat.*

[2] *U.S. Customs and Border Protection (2022, January 12) Minnesota CBP Stops the Deadly Introduction of Bushmeat in the U.S. https://www.cbp.gov/newsroom/local-media-release/minnesota-cbp-stops-deadly-introduction-bushmeat-us*

to take part in a Thunder operation since the series started in 2017). The Secretariat notes that 34 seizures reported involved primates but it is not known if any of these seizures relate to great ape species or if they were intended for the illegal international market.

12. Publicly reported data on great ape seizures and intake into sanctuaries are an indicator (not a direct proxy) of either poaching or illegal trade levels, as they only capture reported instances of clandestine trade published via publicly accessible platforms. While these instances may significantly undercount poaching and illegal trade activities, they are useful for noting the presence and relative prevalence of these activities.

13. SGA researchers collated data from news articles, sanctuary publications, and social media on great apes taken into African primate sanctuaries through 2021[3]. They sourced public records of more than 1,140 great apes that entered African sanctuaries through 2021, but in many cases information on the origin of these apes was not provided. The information available for the origin of 752 of these great apes indicated that at least 36 individuals (5%) were being trafficked internationally at time of confiscation. The other 716 great apes (95% of these 752 individuals) originated from poaching and trade occurring at a local or national level. All data from published sources have been shared with the GRASP Apes Seizure Database for further analysis.

14. A study on orangutan (*Pongo* spp.) killing and trade in Indonesia from 2007 to 2019 documented 2,229 reported crimes, primarily related to poaching and illegal trade[4]. Crimes also included harm to orangutans, such as gunshot- or machete wounds.

15. Illegal trafficking of great apes via social media websites is a serious concern. A study on sales of orangutans and other wildlife in Indonesia in 2017–2018 and 2020–2021 through Facebook and Instagram recorded orangutans and chimpanzees for sale[5]. A study on the perceptions of YouTube videos showing humans interacting with orangutans in sanctuary settings found that videos of these interactions, particularly when they involved infant orangutans, led viewers to express perceptions that orangutans in human contact were a positive outcome, and a desire on the part of the viewers to own the animals as pets[6].

Status of and threats to great apes

16. An update on the status of and threats to great apes is included as Annex 3. The overall status of great apes has not improved since the 2018 report to CITES and the key threats and drivers have not changed (habitat loss, degradation and fragmentation, poaching, disease and illegal trade). Many populations continue to decline, indicating that threats have not been sufficiently addressed and populations are not stabilizing. There has been one change in the IUCN Red List classification of great apes since 2018, the downlisting of the mountain gorilla subspecies (*Gorilla beringei beringei*) from Critically Endangered to Endangered. Nonetheless, the eastern gorilla species (*Gorilla beringei*) remains Critically Endangered. All other great ape taxa remain Critically Endangered or Endangered.

Recommendations

17. The Standing Committee is invited to:

    a) recall recommendations in Resolution Conf. 13.4 (Rev. CoP18) and, considering the continued declines in great ape populations reported in the present document and its Annexes, encourage Parties, intergovernmental organizations, international aid agencies and non-governmental organizations to implement comprehensive enforcement controls to address illegal trade in great apes, including local and online sales of specimens, including live apes;

    b) encourage all great ape range States to take urgent steps to develop, implement, or expand *in situ* great ape management and conservation programmes addressing the major drivers of great ape population

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3 *Wildlife Impact, unpublished data*

4 *Sherman, J., Voigt, M., Ancrenaz, M., Wich, S.A., Qomariah, I.N., Lyman, E., Massingham, E. & Meijaard, E. (2022). Orangutan killing and trade in Indonesia: Wildlife crime, enforcement, and deterrence patterns. Biological Conservation 276, 109744.*

5 *Nijman, V., Smith, J.H., Foreman, G., Campera, M., Feddema, K. & Nekaris, K.A.I. (2021). Monitoring the Trade of Legally Protected Wildlife on Facebook and Instagram Illustrated by the Advertising and Sale of Apes in Indonesia. Diversity 13, 236.*

6 *Freund, C.A., Heaning, E.G., Mulrain, I.R., McCann, J.B. & DiGiorgio, A.L. (2021). Building better conservation media for primates and people: A case study of orangutan rescue and rehabilitation YouTube videos. People and Nature 3, 1257-1271.*

declines and illegal trade, namely poaching for wild meat, or conflict, and deforestation of great ape habitats;

c) encourage great ape range States to coordinate action on known or suspected illegal great ape trade;

d) urge all Parties to provide accurate and up-to-date information on illegal trade in great apes in the CITES Annual Illegal Trade report in a timely manner, following the guidelines developed by the Secretariat and, as appropriate, consider contributing to the GRASP Apes Seizure database and the IUCN SSC A.P.E.S. database as per Resolution Conf. 13.4 (Rev. CoP18); and

e) encourage Parties, intergovernmental organizations, international aid agencies and non-governmental organizations to consider any relevant actions or assistance to address illegal trade in great apes and support the conservation of great apes, and to bring any such actions or assistance to the attention of the Secretariat.

ONGOING GRASP AND SGA ACTIVITIES
(provided by GRASP and SGA)

1. The IUCN SSC SGA's ARRC Task Force (Avoid, Reduce, Restore, Conserve https://www.arrctaskforce.org/) addresses the growing impacts to apes from energy, infrastructure and extractive industry projects. Often these projects open up new roads that bring in international and local workers, new settlements and, along with them, commercial bushmeat trade and disease, providing fertile ground for the illegal wildlife trade. For the lending banks that support these projects and the companies that buy the minerals, reducing the associated threats to great apes has become a priority. In 2018, the SGA was successful in moving the World Bank's International Finance Corporation (IFC) to change their lending guidance and require all companies seeking loans in areas that overlap with great ape habitat to consult with the SGA. This process was formalized through the creation of the ARRC Task Force, which strengthens capacity in the range States and advises lending banks, such as the IFC, to ensure that their clients not only avoid ape habitat where possible, but also minimize their impacts on great apes. Through the ARRC Task Force, the SGA is reducing the threats to great apes associated with development projects, especially loss of habitat and illegal trade.

2. GRASP developed and manages the global repository of great ape seizure data, the Apes Seizure Database.

3. Other current GRASP projects addressing trade in great apes are: a collaboration with UNODC on illegal wildlife trade in the Congo Basin, including great apes, elephants, pangolins and other taxa; a partnership with the Task Force to assess risks associated with large-scale development projects, including illegal trade along new development corridors. Via the ARRC Task Force, GRASP also contributed to the revision of IFC Performance Standard 6 and has provided input on a number of planned development projects.

4. The IUCN SSC A.P.E.S. database (https://www.iucngreatapes.org/apes-database) enables monitoring of changes in great ape population trends and meta-analysis of species/subspecies distribution and abundance. The closely linked A.P.E.S. Wiki (https://wiki.iucnapesportal.org/index.php/The_A.P.E.S._Wiki), provides complementary information on ape population status, threats, conservation activities, and research activities.

5. A new regional conservation action plan for western chimpanzees was published in both English and French (IUCN SSC Primate Specialist Group 2020). This plan includes a recommendation to improve regional coordination to address illegal chimpanzee trade. In 2021, an implementation committee was established to address the nine strategies laid out in the plan, which includes representatives from all eight western chimpanzee range countries.

6. A study on conflict mining in protected areas in eastern Democratic Republic of Congo (DRC) was finalised by GRASP in 2021, with an analysis of the environmental impacts including illegal wildlife trade.

7. Collaborators of the IUCN SSC A.P.E.S. database regularly produce an Ape Abundance Annex to accompany the *State of the Apes* book series. The Ape Abundance Annex lists the most recent surveys of each great ape taxon by country with an abundance class for each site surveyed (Sop et al. 2020). The next update will be published later in 2023.

SUMMARY OF SEIZURES OF SPECIMENS OF GREAT APE SPECIES
AS REPORTED BY CITES PARTIES IN THEIR ANNUAL ILLEGAL TRADE REPORTS
(2016 TO 2022), [CITES ILLEGAL TRADE DATABASE, ACCESSED JULY 2023]

Year	ISO country code	Scientific Name (as reported)	Description of specimen[7]	Original quantity	Original unit
2016	FR	*Gorilla*	SKU	1	NUM
2016	US	*Gorilla gorilla*	SPE	1	NUM
2016	BD	*Pan*	CLA	1	NUM
2016	CI	*Pan troglodytes*	LIV	1	NUM
2016	CI	*Pan troglodytes*	LIV	1	NUM
2016	US	*Pan troglodytes*	SKU	1	NUM
2016	US	*Pan troglodytes*	SKU	1	NUM
2016	US	*Pan troglodytes*	SKU	1	NUM
2016	KW	*Pongo pygmaeus*	LIV	1	NUM
2016	US	*Pongo pygmaeus*	SKU	2	NUM
2017	US	*Gorilla gorilla*	SPE	1	MLT
2017	NP	*Pan*	BOD	2	NUM
2017	GB	*Pan troglodytes*	BOD	2	NUM
2017	GN	*Pan troglodytes*	BOD	3	NUM
2017	GN	*Pan troglodytes*	LIV	1	NUM
2017	GN	*Pan troglodytes*	LIV	30	NUM
2017	US	*Pan troglodytes*	SPE	1	MLT
2017	GB	*Pan troglodytes*		1	NUM
2017	TH	*Pongo*	LIV	2	NUM
2017	TH	*Pongo*	LIV	2	NUM
2017	GB	*Pongo*	SKU	2	NUM
2018	FR	*Gorilla gorilla*	SKU	1	NUM
2018	GB	*Gorilla gorilla*	SKU	2	NUM
2018	TR	*Pan paniscus*	LIV	1	NUM
2018	TR	*Pan paniscus*	LIV	1	NUM
2018	GN	*Pan troglodytes*	LIV	1	NUM
2018	GB	*Pan troglodytes*	SKU	3	NUM
2018	MY	*Pongo abelii*	LIV	1	NUM
2018	MY	*Pongo abelii*	LIV	1	NUM
2018	MY	*Pongo abelii*	LIV	2	NUM
2018	MY	*Pongo abelii*	LIV	3	NUM
2018	DE	*Pongo pygmaeus*	SKU	1	NUM
2018	GB	*Pongo pygmaeus*	SKU	3	NUM

[7] *For explanation of codes see here*

Year	ISO country code	Scientific Name (as reported)	Description of specimen[7]	Original quantity	Original unit
2019	FR	*Gorilla gorilla*	FOO	1	NUM
2019	FR	*Gorilla gorilla*	SKU	1	NUM
2019	MM	*Pan*	FEA	48[8]	BAG
2019	HK[9]	*Pan*	FEA		
2019	HK	*Pan*	FEA		
2019	HK	*Pan*	FEA		
2019	GN	*Pan troglodytes*		1	NUM
2019	ID	*Pongo*	LIV	1	NUM
2019	ID	*Pongo*	LIV	2	NUM
2019	ID	*Pongo*	LIV	3	NUM
2019	ID	*Pongo*	LIV	3	NUM
2019	ID	*Pongo*	LIV	3	NUM
2019	BE	*Pongo pygmaeus*	SKU	1	NUM
2020	FR	*Gorilla gorilla*	SKP	1	NUM
2020	FR	*Gorilla gorilla*	SKU	1	NUM
2020	FR	*Pan*	BOP	2	NUM
2020	TR	*Pan*	LIV	17	NUM
2020	FR	*Pan*	SKU	1	NUM
2020	CD	*Pan paniscus*	SKP	4	NUM
2020	FR	*Pongo pygmaeus*	SKU	3	NUM
2021	CD	*Pan troglodytes*	LIV	1	NUM
2021	CD	*Pan troglodytes*	LIV	1	NUM
2021	CD	*Pan paniscus*	MEA	4	NUM
2021	FR	*Pan*	MEA	4	KIL
2021	FR	*Pan*	MEA	1	NUM
2022	CD	*Pan troglodytes*	LIV	1	NUM
2022	CD	*Pan troglodytes*	LIV	1	NUM

[8] *This is likely to be an incorrect entry as FEA refers to Feathers*

[9] *HK refers to Hong Kong Special Administrative Region of China.*

BRIEF UPDATE ON GREAT APE CONSERVATION STATUS
FROM THE SECTION ON GREAT APES (SGA) OF THE IUCN SSC PRIMATE SPECIALIST GROUP
AND THE GREAT APES SURVIVAL PARTNERSHIP (GRASP)
(provided by GRASP and SGA)

The overall status of great apes has not improved since our 2018 report to CITES (https://cites.org/sites/default/files/eng/com/sc/70/E-SC70-52.pdf). Many populations continue to decline, indicating that threats have not been sufficiently addressed and populations are not stabilizing.

Changes in African great ape conservation status

1. There has been one change in the IUCN Red List classification of great apes since the 2018 GRASP and IUCN report to CITES: downlisting of the mountain gorilla subspecies (*Gorilla beringei beringei*) from Critically Endangered to Endangered. Nonetheless, the eastern gorilla species (*Gorilla beringei*) remains Critically Endangered. All other great ape taxa (bonobos, chimpanzees, western gorillas, Bornean, Sumatran and Tapanuli orangutans) remain Critically Endangered or Endangered.

2. While the IUCN SSC database and IUCN Red List project the highest rates of future decline (>5.0% annual decrease) for eastern chimpanzees (*Pan troglodytes schweinfurthii*), western chimpanzees (*Pan troglodytes verus*) and Grauer's gorillas (*Gorilla beringei graueri*), the western lowland gorilla (*Gorilla gorilla gorilla*) has suffered the biggest decrease in numbers. If the decline of this subspecies has continued as expected, nearly 90,000 gorillas have been lost in the past decade (we noted previously that the total number would drop to approximately 316,000 in 2018, and to around 300,000 by 2020; Williamson et al. 2020).

3. The population estimate for Grauer's gorillas has been adjusted upwards to 6,800 individuals through improved methods and survey coverage (Plumptre et al. 2021). Adjacent to Kahuzi-Biega National Park, the recently-created Oku Community Reserve in DRC is home to 2,240 gorillas. Although highly significant new information, the Grauer's gorilla population has not actually increased and the subspecies' Red List status will not change.

4. A reassessment of bonobos (*Pan paniscus*) in Salonga National Park (Bessone 2022) has confirmed that this park is the species' stronghold; however, a range-wide assessment of the density and distribution of bonobos is urgently needed for effective conservation of the species. Large areas of the species' geographic range have yet to be surveyed and the bonobo is the only species of great ape for which a reliable estimate of total population size is still not available.

Changes in Asian great ape conservation status

1. Peer-reviewed publications continue to show marked orangutan population declines, with both on-the-ground surveys and modelling based on nest counts in the field finding smaller populations and lower densities and occurrence rates (Utami-Atmoko et al. 2017; Santika et al. 2022; Yuliani et al. 2023; Galdikas et al. 2023).

2. A recent analysis based on more than 50 years of surveys monitoring Bornean orangutan (*Pongo pygmaeus*) populations in Tanjung Puting National Park showed that the male population has declined dramatically, with the number of adult males encountered decreasing from 40 in 1976 to eight in 2016, and only two of these being flanged adult males (Galdikas et al. 2023). This study points to disruption of natural dispersal of male orangutans, which in turn increased risk of accelerated extirpation of local populations, including in Tanjung Puting National Park, which is a legally protected stronghold for the species.

3. Recently published surveys of Bornean orangutans in and around Danau Sentarum National Park describe a huge decline in orangutan numbers, from ca. 1,025 individuals in the park and 1,707 in surrounding areas surveyed in the 1990s, to a mere 202 in the park and 71 in surrounding areas estimated in 2010 and 2014 (Yuliani et al. 2023).

4. The Tapanuli orangutan (*Pongo tapanuliensis*) population, at risk from hydropower and gold mining development as well as poaching and deforestation for small-scale agriculture (Meijaard et al. 2021; Sherman et al. 2022), has declined to an estimated 767 individuals (Laurance et al. 2020).

Threats to great apes

Note that the key threats and drivers discussed in our 2018 report to CITES have not changed, and their intensity has not decreased. The expansion of human footprint, croplands, roads, and pasture for livestock is driving an extinction crisis for great apes and other primate taxa (Torres-Romero et al. 2023). These threats and their drivers continue to result in great apes being killed for bushmeat, and in some cases captured live for the local pet trade Bushmeat and pet trade in great apes is primarily local (within the national borders where the apes are captured). A few live bonobos, western chimpanzees, and orangutans are also traded internationally. For all great ape taxa, social media-driven trade could drive international trafficking of live animals (see for example: Nijman et al. 2021; Nkala 2022).

Despite significant effort and funding dedicated to improving the conservation situation for great apes (see Santika et al. 2022), all great apes face significant—and in many cases escalating—threats that put them at risk of extinction. Precipitous local population declines recorded since 2018 and activities leading to clearing or disturbance of forest habitats in key great ape population strongholds highlight the urgent need for increased effort to protect great apes in their remaining habitats. The poaching of great apes, regardless of its purpose, presents a serious and immediate threat to most great ape taxa. In the face of ongoing population declines, intense pressures on their habitats due to human land use, and high levels of poaching for local trade and bushmeat, the offtake of even relatively small numbers of individuals for illicit international trade places unsustainable pressure on great apes. As is the case for many rare species, social media platforms and other online trading options are being used to facilitate both local and international trade in great apes, which may drive additional demand for poaching and trade both locally and internationally.

Since the 2018 GRASP and IUCN report to CITES, the major threats to African and Asian great ape populations are unchanged. Great apes are threatened by habitat loss, degradation and fragmentation, poaching, disease and illegal trade. Despite long-standing legal protection, law enforcement remains a major challenge in many countries, and poaching, especially for the illegal domestic trade in bushmeat, is one of the most significant threats to the survival of great apes. The numbers of great apes lost each year to poaching are significant, and for most taxa, poaching levels exceed the hunting offtake rates projected to drive great apes to extinction. For example, studies (Sherman et al. 2022; Meijaard et al. 2011) suggest that the number of orangutans killed annually exceeds the 1% additional hunting mortality rate projected to extirpate local populations (Marshall et al. 2009).

Expansion of industrial development projects

There is major overlap between industrial development projects and great ape range, both in and outside protected areas. For example, mining exploration and exploitation overlaps with approximately 20% of African ape habitat (ARRC Task Force 2022a). Mineral production in Africa has increased by 30% in the last two decades and trade in some minerals is expected to increase up to 1,000% by 2030 (ARRC Task Force 2022a). In western chimpanzee range alone, there are currently over 1,000 mining projects covering 30% of the subspecies' range. This overlap is particularly high in Guinea (65%), the country with the largest remaining population of western chimpanzees (ARRC Task Force 2022b). Western chimpanzees are also threatened by almost 100 potential, planned and existing hydropower projects (ARRC Task Force 2022b). Western chimpanzees and Tapanuli orangutans, in particular, face severe and imminent threats from the cumulative impacts of such projects.

Deforestation and drivers

The expansion of agriculture is major driver of deforestation and biodiversity loss (Busch and Ferretti Gallon 2017; Potapov et al. 2022). Expansion of industrial and smallholder agriculture, primarily for rice, cacao, cassava, maize, and oil palm, drive great ape habitat loss and fragmentation, and bring humans into greater conflict with great apes (Meijaard et al. 2023). Human population growth coupled with increased demands for food products and economic opportunities are projected to drive expansion of agriculture across 193-317 million hectares by 2050, with most growth happening in Africa (Schmitz et al., 2014).

While deforestation for industrial agriculture has declined notably in Indonesia in recent years (Gaveau et al. 2022), clearing of orangutan habitat is still taking place, often through expansion of smallholder plantations and local farms, although clearing for infrastructure, industrial agriculture, and mining is also ongoing (The Tree Map 2023), including in the limited remaining habitat of the Tapanuli orangutan (Jong & Simangunsong 2023; Prasetyo et al. 2021). Projected deforestation in Bornean orangutan habitats suggests that the species will continue to decline steeply unless additional efforts are made to protect orangutans in plantations and to prevent the conversion of logged forests (Voigt et al. 2022). High orangutan losses are expected in industrial plantations and unprotected forest habitats.

Industrial mining is one of the top drivers of deforestation globally, with tropical rain forests standing out as mining-related deforestation hotspots. Deforestation trends suggest that the situation is worsening, where 65% of forest loss since the year 2000 has occurred in the past 10 years (Giljum et al. 2022). These patterns, which are driven by a rapidly growing global demand for critical minerals vital to energy transitions, are expected to exacerbate deforestation over the coming years if companies continue business-as-usual.

Demand for timber, wood products and derivatives (including sawn and round wood, paper products and wood products burned for energy) are surging, driving a predicted 54% increase in wood harvests between 2010 and 2050 (Peng et al. 2023). Demand is high for wood and wood products from both Africa and Asia, including in great ape habitat in the Congo Basin (Ferrat et al. 2022) and the tropical forests of Sumatra and Borneo. Selectively-logged forests that are well managed and protected from hunting can have value as great ape habitat (e.g., Gaveau et al. 2013; Morgan et al. 2018). Nevertheless, chimpanzees and gorillas avoided areas where logging was in progress (Morgan et al. 2018).

Smallholder agriculture, compounded by poverty, is expected to be an increasing driver of deforestation (Meijaard et al. preprint). In Central Africa, poverty-driven expansion of small-scale agriculture generates a large amount of deforestation (Meijaard et al. preprint). Agriculture is also a primary cause of forest loss in West Africa. In the southeastern region of Guinea (Guinée Forestière), approximately 25% (10,907 km2) of the region's total land area experienced tree cover loss, primarily due to smallholder agriculture (subsistence and cash crop farming) (Fitzgerald et al. 2021). Of this total loss, 364 km2 occurred in protected areas with high biodiversity value.

Industrial agriculture, mining, logging, and infrastructure development disturb intact tropical forests in great ape habitats, and in turn open up access into these areas, attracting human in-migration and activities, driving away great apes and increasing opportunities for their poaching and trade (Morgan et al. 2019; Ferrat et al. 2022; Prasetyo et al. 2023; Spencer et al. 2023). Roads, railways, powerlines, pipelines, and other linear infrastructure disrupt great ape movement and dispersal, lead to great ape deaths from collisions with vehicles, and also increase human access to intact forests, facilitating development, poaching and establishment of new trade routes, also causing pollution and other negative impacts on the ecosystem (Ancrenaz et al. 2017; Sloan et al. 2018; Hughes 2019; Morgan et al. 2019; McLennan et al. 2021; Ferrat et al. 2022).

Poaching and drivers

Great apes are illegally traded internationally, albeit currently in relatively small numbers (Sherman et al. 2022; Head et al. 2020); however, these trades may fluctuate with demand (e.g., Beastall et al. 2016; Head et al. 2020). Regardless of whether traded internationally or locally, poached and captured individuals are taken from their natural habitats and their loss is part of the overall species and subspecies decline. The traded individuals also represent important losses to the breeding, social structure, and genetic diversity of great apes. National trade in great apes for bushmeat, as pets, for traditional medicine and as trophies, enables a flow of live animals that enter the international trade. National trade occurs in almost all great ape range states, and may mask international trade, particularly as online sales make it easier for buyers to connect with traders.

In general, poaching for meat is the most important driver of great ape decline in Central Africa. In northeastern DRC and southwestern Central African Republic, where threats to endangered species are exacerbated by ignorance of hunting laws and lack of law enforcement, illegal trade in chimpanzee meat is rife and live orphans are sold on local markets (Ondoua Ondoua et al. 2017). However, the principal driver of chimpanzee killing in this region is for their meat – for the local artisanal mining population and for the wider bushmeat trade in general (Plumptre et al. 2015).

Orangutans are killed opportunistically for bushmeat (Meijaard et al 2011) and because the animals are perceived as threats to crops or human safety (Sherman et al. 2020,2021,2022). This results in relatively large numbers of adult orangutans poached and infant orangutans entering the local pet trade, with a few individuals being traded internationally (Sherman et al. 2022).

Increases in poaching during the COVID-19 pandemic have been compounded by loss of the tourism revenues that would normally fund protection efforts (Reuter et al. 2022). Local residents' loss of employment, particularly in ecotourism and wildlife law enforcement, resulted in an increase in illegal activities.

Infectious diseases

Evidence of transmission of human respiratory viruses to human-habituated great apes is accumulating, often with fatal outcomes (Dunay et al. 2018; Grützmacher et al. 2016; Mazet et al. 2020; Negrey et al. 2019; Patrono et al. 2018; Scully et al. 2018), and disease threats to great apes now include SARS-CoV-2, also known as

COVID-19 (Gillespie & Leendertz 2020). When the global pandemic was declared in 2020, the SGA issued a series of advisories (https://www.iucngreatapes.org/covid-19) and African governments suspended great ape tourism activities. Tourism cautiously resumed with the roll out of human vaccination and with much stricter disease prevention measures in place, including wearing of facemasks, provision of handwashing stations and use of COVID-19 lateral flow tests. Subsequently, a conservation education initiative was designed to "protect great apes from disease" (https://www.protectgreatapesfromdisease.com/) and a policy brief was issued by the African CSO Biodiversity Alliance, in English and French. Meanwhile, the threat of Ebola virus disease has not receded and, if this highly lethal haemorrhagic fever re-emerges in the vast forests of Central Africa, it could wipe out thousands of great apes in just a few months. Whether and how to vaccinate great apes continues to be debated.

Climate change

Climate change predictions published by Carvalho et al. (2021) combined climate, land use and human population changes to predict changes in African great ape distribution. Massive habitat decline is expected by 2050, and the ability of great apes to occupy new areas will be limited by their dispersal capacity, migration lag and ecological constraints. This study provides policy makers with compelling arguments for aligning biodiversity conservation planning with projected climate change, both in and outside protected areas.

A new study has quantified the extent of climate change across 300 African great ape sites with special focus on extreme climate events. The study found that many great ape sites have already experienced changes in temperature and rainfall and that many will experience one or several extreme climate events of droughts, heat waves, tropical cyclones, flooding, fire, and crop failure (Kiribou et al. in review). The impacts of climate change may compound habitat destruction or fragmentation. For example, mountain gorillas drink from open water sources during hot days (Wright et al 2022), and current climate models predict higher temperatures in great apes habitats, thus potentially increasing the need to drink from open water sources and increasing the risk of parasites and infection with human diseases. Orangutans also use human-created water sources that are likely contaminated with human waste (Oram pers. comm.).

Interactions with humans

Expanding agriculture, mining, logging, infrastructure development, and human presence in great ape habitats is leading to increased interactions between great apes and humans. These interactions pose immediate risks of killing for bushmeat and over conflicts due to crop raiding or fear of human safety, and increased opportunity for capture and trading, as well as disease transmission risks.

Continent-wide modelling of African great ape density distribution (Ordaz-Nemeth et al. 2021) predicted densities from 0 to 5.8 individuals per km², which were highest in Central Africa and lowest in West Africa. The Human Footprint (an index based on human population density, cropland, roads, infrastructure and other development indicators https://www.worldwildlife.org/threats/the-human-footprint) was a strong predictor of great ape population density. High Gross Domestic Product values were associated with lower great ape densities. Only 10.7% of the total predicted population was found in IUCN Category I and II protected areas.

Recent examples of how increasing interactions with humans pose risks to great apes include Tapanuli orangutans avoidance of construction in their habitat, limiting their access to natural food sources and apparently increasing crop foraging (Jong & Simangunsong 2023; Prasetyo et al. 2021), elevated stress in eastern chimpanzees living in human-dominated landscapes (McLennan et al. 2019), lower estimated population densities and avoidance of habitat areas with logging and roads in central chimpanzees and western gorilla (Morgan et al. 2018). Crop foraging by great apes feeds into perceptions of the animals as pests, in many cases leading to retaliatory killings and crop protection measures that can have fatal consequences for great apes (McLennan et al. 2021; Meijaard et al. 2011).

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